

ABSTRACT

JOHNSON, KECIA RENEE. Prison, Race and Space: The Impact of Incarceration on Career Trajectories and Labor Market Outcomes. (Under the Direction of Donald Tomaskovic-Devey.)

There are a number of reasons to expect that incarceration will have long-term, negative consequences for economic/labor market success, and that the consequences may be especially acute for minority ex-offenders. This study replicates and extends Bruce Western's research on the impact of incarceration for wage mobility. I integrate Western's life course approach to examining the impact of incarceration with a discussion of stratification processes that produce inequality in employment and earnings outcomes. I hypothesize that incarceration results in career earnings penalties over and above those associated with foregone human capital accumulation. I suspect that incarceration contributes to a decline in earnings for minority ex-offenders. At the individual level, I replicate Western's research by estimating fixed-effects models to examine wages across the career trajectories of white, Latino and African American men from the National Longitudinal Survey of Youth for 1979-1998. When estimating these models, I test whether human capital accumulation that occurs inside or outside the labor market mediates the incarceration-earnings relationship. Furthermore, I examine how local labor market characteristics influence ex-offender career trajectories. I propose that prison records, race/ethnicity and spatial characteristics such as, violent crime rates, unemployment rates, minority concentration, and residential segregation influence the job prospects of workers within metropolitan areas. At the spatial level, I estimate random effects models to examine how local labor market characteristics shape the earnings trajectories of white, Latino and African American male ex-offenders. The individual level results supported the hypotheses that incarceration has a negative effect on earnings and that ex-offenders have lower

earnings trajectories than non-offenders. This study did not replicate Western's finding that the earnings penalty experienced by those who had been incarcerated varies by race/ethnicity. The spatial analysis results suggest that the prison effect on wages is not influenced by the spatial characteristics associated with the local labor market. However, the results indicate that the spatial characteristics of the labor market influence race/ethnicity wage disparities across the career. This study makes a contribution to the existing literature on the consequences of incarceration by linking attributes of ex-offenders, emergent career dynamics and local labor market prospects within a stratification framework.

**PRISON, RACE AND SPACE:
THE IMPACT OF INCARCERATION ON CAREER TRAJECTORIES AND
LABOR MARKET OUTCOMES**

by

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DEDICATION

In loving memory of my great-grandmother Ruth N. Scott (1899-1999) who provided me with a strong spiritual foundation, emphasized the importance of Psalms 23 and taught me how to pray; my grandfather Earl S. Scott (1923-1994) who always said, "Kecia is a smart little girl"; and my uncle Felix E. Scott (1944-2002) who always gave me advice and made me smile. Thank you for encouraging me to work hard and do my best. I hope that I have made you proud.

BIOGRAPHY

I was born and raised in Savannah, Georgia. At an early age, my family instilled in me the importance of education. My quest for knowledge began in elementary school. I loved to read. When I would play “school” with my friends, I loved being the teacher. I remember how happy I was when my grandmother took me to the public library to apply for my library card. As I grew older, I did not mind being considered one of the “smart” kids. Being one of the “smart” kids paid off, once it was time to apply to college. I was fortunate to have two high school teachers, Tom Waters and Lisa Callahan who were wonderful mentors. My family’s nurturing, support and encouragement resulted in me being Valedictorian at Tompkins High School in June 1988.

The following August, I enrolled at Clemson University. Initially, I was an engineering major. To fulfill a humanities requirement, I enrolled in an Introduction to Sociology class taught by the late Pat Smith. I really enjoyed Dr. Smith’s class. We talked about the social injustice in the world and how to create social change. That class really intrigued me. The next semester, I took another sociology class and realized that this was the major for me. In May 1992, I received my Bachelor of Arts Degree in Sociology from Clemson University. I decided that I wanted to learn more about the type of research that sociologists do and how this research can be used to help people, so I remained at Clemson and earned a Masters of Science in Applied Sociology in May 1995.

In August 1995, I began the journey of working on my doctorate in Sociology at North Carolina State University. Throughout my journey in graduate school, I learned that life still presents its challenges as well as its blessings. I have met some wonderful people who have been brought into my life for a reason, a season and for a lifetime. Those friendships and relationships have sustained me and kept me grounded. Even in the midst of working on the dissertation, life brought me a blessing. On July 31, 2003, Jess Henderson asked me to be his lifetime partner. Finally, after 8 years of hard work and dedication, I defended

my dissertation in February 2003. Shortly after completing this stage of my life, I began another journey.

In March 2003, I began a two-year National Science Foundation Postdoctoral Research Fellowship. I am currently working as a Postdoctoral Fellow at the Criminal Justice Research Center at The Ohio State University. During the Postdoctoral fellowship, I will have an opportunity to continue my research concerning the impact of incarceration for individuals. I will also begin working on a project that examines the impact of incarceration on communities in which a large percentage of the residents have been in prison. The goal of the Postdoctoral fellowship is to develop a research agenda that I can continue to build upon when I accept a tenure-track position. As I embark on this intellectual journey, I am looking forward to growing as a scholar and a person.

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I would also like to express my appreciation to the members of my committee Patty McCall, thanks for your encouragement, comments concerning the dissertation and being a part of the 1911 Building night/weekend office crew; Rod Engen thanks for your support and pushing me to think about issues of causality, theoretical integration and your help concerning the modeling of the spatial level analysis and Melvin Thomas, thanks for pushing me to think about the implications of my dissertation findings concerning racial/ethnic inequality issues. I would also like to thank Ted Greenstein and Peg Brant for providing technical assistance concerning SAS, the National Longitudinal Survey of Youth and Census data.

I would like to express my gratitude to Barbara Risman and Maxine Thompson for being mentors who were concerned about my professional as well as my personal development. I really appreciate your support throughout my graduate school career. I also want to express my appreciation to the graduate secretary Penny Lewter for providing me with personal encouragement and playing an integral part in my degree completion. I would also like to thank the rest of the Sociology Department's administrative support staff for the kindness they have shown me throughout the years.

Throughout this journey, I have been fortunate to have friends who have provided me with social support as I faced the demanding task of writing and defending the dissertation. Special thanks to “my sister” Nichole Bruce who always reminded me that it is important to take out time for myself. I appreciate the prayers, the encouraging phone calls, and the good vibes you sent my way. I am so happy that we will have the opportunity to live in the same city again. I am truly looking forward to it.

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CHAPTER 1

INTRODUCTION

1.1. Prologue

According to the Bureau of Justice Statistics (BJS), the number of prisoners under state and federal jurisdiction increased by 82% between 1990 and 2001. Year-end estimates for 2001 indicate that the population in state and federal prisons totaled 1,406,031. Of the nation's 1.4 million prisoners, 622,000 are African American and 209,900 are Latino (Harrison and Beck 2001).

When examining the racial and ethnic composition of the nation's prisons, BJS estimates suggest that minority individuals are disproportionately imprisoned. Whereas, African Americans and Latinos together constitute only 24% of the nation's population, these minority groups comprise 63% of the individuals incarcerated. Whites constituted only 37% of those imprisoned. African Americans are about ten times more likely to be incarcerated than whites, and indeed, nearly 10% of African American men between the ages of 25 and 29 are in prison. This compares to 2.9% of Hispanic and 1.1% of white men in the same age group (Harrison and Beck 2001).

The differential patterning of incarceration by race and ethnicity has stimulated considerable research. A great deal of this work focuses on the determinants of incarceration, including the extent to which race/ethnicity influences imprisonment. For example, a large body of work has focused on how race (and sometimes ethnicity) affects the likelihood that offenders will receive a prison sentence (see Spohn 2000 and Zatz 2000 for recent reviews of the sentencing literature.) However, less attention has been given to the differential consequences of incarceration for racial/ethnic group members.

There are a number of reasons to expect that incarceration will have long-term, negative consequences for economic/labor market success, and that the consequences

may be especially acute for minority ex-offenders. The failure of research to take this into account limits our understanding of how the stigma of being incarcerated and the cumulative disadvantage associated with race/ethnicity may simultaneously influence the re-entry of prisoners into the labor market. Spending time in prison may seriously damage the future employment prospects of these ex-offenders. Employers may label minority ex-offenders as poor quality job applicants due to the low educational attainment and limited work experience associated with the prison population. Upon being released from prison, low-skilled minority ex-offenders may experience longer periods of joblessness. These spells of joblessness may translate into an employment or earnings penalty across the career. As a consequence of incarceration, the employment or earnings penalty these young minority men may incur perpetuates racial/ethnic inequality within labor markets.

There is clearly a need for researchers to develop the current theoretical and empirical literature to understand the consequences of incarceration for employment opportunities and career earnings of ex-offenders. This study contributes to the stratification literature by examining how the prevalence of incarceration for young minority men impacts their labor market opportunities throughout the career. Furthermore, this study addresses the consequences of going to prison for racial/ethnic minorities and how differential opportunities within the labor market may contribute to generating inequality throughout the career.

1.2 Project Description

This study offers a theoretically unique approach to examining the consequences of incarceration for racial/ethnic group members by combining inequality theories, labor market process theories and relevant criminological perspectives. In this study, I address the following three research questions: To what extent does incarceration

influence the employment, earnings and career trajectories of young men? Is the economic penalty of incarceration the same for individuals from different race/ethnic groups? Do characteristics of the labor market affect the relationship between incarceration and economic outcomes for individuals? To address these questions, I develop statistical models of individual economic outcomes that link such opportunities to the accumulation of human capital and wage inequality as well as variation in opportunity and discrimination across local labor markets.

The impact of incarceration on labor market outcomes is a fairly undeveloped area with a modest research literature. However, the work of Bruce Western has been influential in the current theoretical and empirical development of this topic. Western (2002) draws upon a life course perspective of crime that treats incarceration as a turning point, which disrupts the employment trajectory. For young men who experience incarceration, this disruption potentially restricts access to employment (Sampson and Laub 1993). Western identifies three causal mechanisms--*stigma*, *human capital* and *social capital*-- that explain how incarceration is linked to slow wage growth. Using data from the National Longitudinal Survey of Youth (NLSY) for the years 1983-1998, Western uses ordinary least squares (OLS) regression and fixed effects models (the appropriate statistical technique for a longitudinal analysis of continuous outcomes) to examine the wage mobility in a sample of young white, African American and Latino men. He found that incarceration reduced the rate of wage growth by 30% (2002: 541). Therefore his analysis provides strong evidence for slow wage growth among ex-offenders.

In this study, I replicate and extend Western's research on the impact of incarceration for wage mobility. Similar to Western, I use OLS regression and fixed-effects models to examine wage mobility across the career trajectories of a sample of young men from the NLSY for the period 1979-1998. However, in this study I make a

theoretical and empirical distinction between the exogenous and endogenous human capital accumulation that ex-offenders may experience within the labor market context. By making this distinction, I am able to model and see how exogenous human capital (i.e., human capital acquired outside the labor market such as, education and cognitive skill) functions as an intervening mechanism between incarceration and wages. Likewise, I am able to model endogenous human capital (i.e., human capital acquired inside the labor market such as, tenure, unemployment, work experience), and examine whether it serves as an intervening variable that links incarceration and wages. By making this theoretical distinction and testing it empirically, I will be able to determine whether the effect of incarceration is mediated by the accumulation of human capital that occurs inside or outside the labor market.

This study's unique contribution builds upon Western's research in three ways. First, I draw upon the stratification literature to discuss how the three causal mechanisms Western identified may explain how employers evaluate workers and influence labor market opportunities. Within the stratification literature, research has clearly documented that these processes influence the employment and earnings trajectories of individuals. However, the stratification literature has not fully explored the impact of the penal system on labor market opportunities for young minority men. Therefore, this study addresses this need by incorporating Western's idea of incarceration as a career disruption into a stratification framework. Specifically, I argue that as a consequence of going to prison, employers may potentially evaluate ex-offenders as poor quality workers. As a result of being labeled poor quality workers, ex-offenders as a group will not have opportunities to accumulate capital. Thus, I contend that ex-offender labor market opportunities will be limited. Prior research shows that for ex-offenders, lengthy incarceration records appear to reduce opportunities and prospects for stable employment later in life (Sampson and Laub 1993). I suspect that

incarceration results in career earnings penalties over and above those associated with foregone human capital accumulation. Furthermore, I argue that incarceration contributes to a decline in earnings for young men--especially for minority men whose employment prospects are extremely poor. I suspect that the stigmatized identity of being an ex-offender reinforces the already marginal position of being a minority group member in the labor market (Freeman 1992; Uggen 1999; Western and Pettit 1998; 1999; Western 2000).

Second, I extend Western's research on the impact of incarceration because I empirically test the influence of incarceration on the accumulation of endogenous human capital. Specifically, I examine how the stigma associated with incarceration may increase the risk of unemployment or limit work experience for ex-offenders across the career. Through understanding the effect of incarceration on labor market dynamics, I can better explain how incarceration undermines the acquisition of human and social capital.

Third, my extension of Western's research introduces the idea of examining how the incarceration-earnings relationship is influenced by the characteristics of the local labor market. I propose that prison records, race/ethnicity and spatial characteristics, (i.e., violent crime rates, unemployment rates, minority concentration, and residential segregation) influence the job prospects of workers within metropolitan areas. The spatial level analysis will allow me to determine whether the prison effect and the race/ethnicity effect on earnings are mediated by labor market dynamics.

Overall, this study attempts to provide a clearer picture of how the penal system impacts the labor market opportunities of disadvantaged and minority men. I integrate Western's life course approach to examining the impact of incarceration with a discussion of stratification processes that produce inequality in employment and earnings outcomes. This study makes a contribution to the existing literature on the

consequences of incarceration by linking attributes of ex-offenders, emergent career dynamics and local labor market prospects within a stratification framework.

1.3 Outline of Subsequent Chapters

In Chapter 2, I address two issues that are important for the individual level of analysis. First, I examine literature concerning how race/ethnicity affects cumulative labor market outcomes such as work experience and unemployment. Longer periods of unemployment and less work experience across the career may result from employers evaluating the human capital of job applicants from diverse race/ethnic groups differently due to real differences in skills or because of discriminatory perceptions of their abilities (Holzer 1996). Then I discuss how stereotypes associated with race/ethnicity may affect opportunities for individuals to accumulate human capital, through fewer chances to gain employment. Also I explain how race/ethnicity may affect the accumulation of social capital, through individuals lacking access to information networks that are aware of employment opportunities. In general, I draw from the stratification literature to inform the argument I make concerning how race/ethnicity may affect cumulative labor market experiences. Due to the possibility of the stereotypes associated with race/ethnicity leading to differential cumulative labor market experiences, African Americans and Latinos may have lower earnings trajectories throughout the career.

Second, I examine and assess literature concerning the causal mechanisms that link incarceration to employment and earnings at the individual level. Using the life course perspective, I discuss the impact of incarceration as a stigmatizing event, its possible effects on human and social capital accumulation, and how incarceration disrupts the career trajectory of individuals. Building on this literature, I develop models for examining incarceration effects on career earnings. I also incorporate the

stratification literature to develop expectations as to how race/ethnicity may shape the relationship between incarceration and employment outcomes.

In Chapter 3, I describe the sample, measures and methods used in the analysis of individual labor market outcomes. The data used in this study are drawn from the NLSY: a national panel study of young men and women aged 14 to 21 in 1979. First interviewed in 1979, these respondents were interviewed annually over a fifteen-year period. Since 1996, the respondents were interviewed biennially. This chapter also outlines the hypotheses pertaining to the analysis that are derived from the theoretical discussion in Chapter 2. I make predictions concerning the impact of incarceration and race/ethnicity on unemployment, work experience and earnings across the career for individuals.

Chapters 4 through 6 examine the impact of incarceration for individual labor market outcomes using OLS regression and fixed effects models. In Chapter 4, I investigate the impact of incarceration on cumulative unemployment. In this chapter, I examine the extent to which incarceration decreases the amount of time ex-offenders are participating in the labor force. I also consider whether minority ex-offenders have longer periods of unemployment than white ex-offenders. Chapter 5 explores the impact of incarceration on the accumulation of work experience across the career. In this chapter, I examine the issue of whether ex-offenders have fewer weeks of work experience across the career than non-offenders. I also investigate whether minority ex-offenders have less work experience across the career than white ex-offenders. Chapter 6 examines the impact of incarceration on earnings trajectories. Specifically, I investigate if incarceration decreases wage mobility across the career. I also explore whether the impact of incarceration on earnings varies by race/ethnicity.

In Chapter 7, I describe the sample, measures, methods and modeling strategy used in the spatial level analysis. The data are derived from three sources for this

analysis. The individual level data from the NLSY are merged with aggregate level data from the 1990 Decennial Census and the 1990 Uniform Crime Reports. In this section, I use OLS regression and random-effects models to examine the impact of incarceration on ex-offender's earnings opportunities within the context of the local labor market. For this analysis, metropolitan statistical areas (MSA) will be the community level spatial unit.

In Chapter 8, I review major findings from the individual and spatial level analyses. I discuss the theoretical and empirical implications of the results for continuing research on the consequences of incarceration for ex-offenders, particularly for ex-offenders from racial/ethnic groups. In addition, I discuss the importance of this project's results in light of the current research on prisoner reintegration into labor markets.

CHAPTER 2

UNDERSTANDING THE IMPACT OF INCARCERATION ON CAREER OUTCOMES

2.1 Introduction

This chapter develops a theoretical model of the impact of incarceration on labor market outcomes and career trajectories for racial/ethnic groups. I begin with a discussion of three causal mechanisms: stigma, human capital and social capital. I use these three mechanisms to explain how race/ethnicity affects employment opportunities and earnings across the career. Next, I discuss how Western uses these mechanisms to examine the impact of incarceration on employment and earnings. Western argues that incarceration stigmatizes individuals, reduces human capital accumulation and weakens social capital. Subsequently, I build upon Western's application by discussing how these mechanisms may result in racial/ethnic differences in labor market outcomes for ex-offenders. Then, I discuss the theoretical importance of specifying the causal order of how these three mechanisms are linked to incarceration. After establishing the causal order appropriate for the study of the consequences of incarceration, I provide a theoretical model that highlights the incarceration-labor market outcome relationship.

2.2 Mechanism 1: Stigma

Goffman defines stigma as an attribute that is deeply discrediting (1963:3). He states that one type of stigma is associated with race/ethnicity. The attitudes related to this type of stigma can transcend individuals and be attributed to the entire group. As a result of the "undesired differentness" that is attributed to the stigmatized group, society members exercise varieties of discrimination. Goffman (1963) argues that society members construct a stigma-theory, an ideology to explain the group's inferiority and account for the potential

danger or threat the stigmatized group represents, thus rationalizing discriminatory behavior toward the stigmatized group.

In this study, I apply Goffman's notion of stigma to explain racial/ethnic disparities that occur within labor markets. For example, employers may develop a stigma-theory that would help them rationalize why they may view racial/ethnic minorities as undesirable job applicants. Since employers lack reliable information about individual job candidates, they may evoke stereotypes they associate with certain racial/ethnic groups when screening out "unqualified" or "undesirable" job candidates. Thus, the stigma associated with group membership may limit the employment opportunities of individuals who belong to the stigmatized group. This argument is analogous to the theory of statistical discrimination¹ put forth by economists and sociologists who study earnings and employment outcomes (see Arrow 1973; Thurow 1975; Phelps 1972 for discussion of statistical discrimination theory).

In a study of the Chicago labor market, Wilson (1991) suggested that statistical discrimination by employers affects the ability of inner city African Americans to obtain jobs. The employers stereotyped African Americans who lived in the inner city as lacking motivation and being uneducated. These employers did not hire African American job applicants because they believed that these attributes lowered individual worker productivity.

A study sponsored by the Russell Sage Foundation concerning how race affects job prospects in the United States found that in the 1990s, negative stereotypes are tools that many employers consciously use for operating their businesses. White employers perceived African American workers as the least desirable job applicants among all the groups in this study. Also, most of the interviewed employers expressed reluctance towards

¹ Statistical discrimination is the use of statistical averages believed to be typical of a group to which an individual jobseeker belongs. Employers may use statistical averages they attribute to a group when making hiring decisions about the productivity of an individual worker (Arrow 1973).

locating businesses in neighborhoods with large concentrations of minority residents (Russell Sage Foundation 1999).

As a group, African American and Latino job applicants are perceived to have high training costs, high turnover rates and lower productivity in the labor force (Polachek 1979). If employers use these group characteristics when making hiring decisions, then they may perceive hiring African American and Latino job applicants as more costly. As a result, it appears to be economically rational for employers to reserve jobs with high on-the-job training costs for white men (Tomaskovic-Devey 1993:60). Therefore employers may discriminate against all members of these minority groups because they expect candidates to be on average, less productive in the target job.

A consequence of using stigma-theory to rationalize racial/ethnic bias in the workplace is that it leads to the segregation of the work force into jobs of unequally valued skills. Since minorities, on average, are perceived to have less human capital, in terms of lower levels of education and less work experience, they tend to be concentrated in low skilled jobs. This form of discrimination results in lower wages for minorities even when they are potentially equally productive with whites. When employers make hiring decisions based upon the stigmatization of racial/ethnic groups, they create a workplace that excludes a group of potential workers who may otherwise be very productive.

In this section, I discussed how the stigma associated with race/ethnicity can be linked to employment and earnings outcomes for racial/ethnic minorities. Next, I discuss how the stigma mechanism is linked to incarceration. Then I examine how the stigma associated with incarceration can be used to explain labor market outcomes for ex-offenders.

How does incarceration stigmatize individuals?

Since the stigma of incarceration is an undesired attribute, those with a criminal record are considered “different” from other people. For example, employers view job seekers with a criminal record as untrustworthy. They may be reluctant to hire job applicants with criminal records for fear that such applicants may harm a customer or be more likely to steal (Holzer, Raphael and Stoll 2002). In a survey of employers in four major cities, Holzer (1996) found that 66% of all employers indicated they would not hire an ex-offender and at least 33% checked the criminal histories of their most recent hired employees.

The stigma of incarceration also has legal consequences. Under state and in some cases federal law, a felony record can temporarily disqualify employment in licensed or professional occupations. Six states (Alabama, Delaware, Iowa, Mississippi, Rhode Island and South Carolina) permanently bar ex-offenders from public employment. Most states also impose restrictions on hiring an ex-offender for particular professions including law, real estate, medicine, nursing, physical therapy and education (Travis, Solomon, Waul 2001; Petersilia, 1999; Western 2001).

The extent to which employers can consider criminal records is subject to both federal and state guidelines. The Equal Employment Opportunities Commission (EEOC) guidelines prohibit “blanket exclusions” of applicants with criminal records. However, employers can consider criminal records so long as the severity of the offense is related to the applicant’s ability to effectively perform the job and so long as the employer considers the time lapsed since offending in coming to a decision (Bushway 1996).

The following studies examine the impact of the stigma associated with criminal conviction and subsequent incarceration. The results from these studies suggest that the stigmatization of ex-offenders makes it problematic for them to obtain employment

because employers may consider their prison record when screening ex-offenders for jobs.

Skolnick and Schwartz's (1962) findings support the idea that the stigma of conviction limits employment opportunities. They divided 100 employers into four groups and presented them with fictitious employment applications. The applications differed among the groups only with regard to the applicant's criminal record (which varied in four ways, ranging from no criminal record to a conviction for assault). The employers responded less favorably to applications reflecting a criminal record than the application showing no record.

Similarly, Boshier and Johnson (1979) examined the employment opportunities of criminal offenders in New Zealand. They argued that criminal offenders complain of having difficulty obtaining employment. In this study, they sent fictitious letters of application from convicted offenders and non-offender controls to 61 companies advertising vacancies in the *New Zealand Herald*. The letters from the convicted offenders contained a paragraph describing the nature of their criminal offense. Of the 46 applications sent by a "convicted thief," 60% of the letters received a negative response. Of the non-offender control letters, only 23% elicited a negative response. They conclude that due to truncated employment opportunities, the stigma of a conviction leads to an increase in the probability of re-offending.

This prejudicial effect of the stigma associated with a criminal record was also supported in studies conducted by Finn and Fontaine (1983; 1985). In the 1983 study, 106 university students enrolled in management courses ranked sixteen fictitious employment applications on preferences for employment. The applications differed in terms of four levels of criminal record and four levels of job qualifications. The applications with a criminal record were clearly less preferred than those with no criminal record. Despite the offender applications having job qualifications equal to the non-

offender applications, students still ranked them lower than the applications with no criminal record. The offender applications with good qualifications did little to mitigate the negative bias associated with criminal background.

In the 1985 study, Finn and Fontaine revised their study and introduced additional variables to continue their investigation of the stigma associated with a criminal background. They selected 225 university students enrolled in management courses to play the role of employment specialists. They prepared 20 fictitious employment applications and divided the students into three groups of 75 each. Each group assessed the 20 applicants relative to one of the following jobs: hand packager, general clerk and salesperson. The researchers selected these entry-level jobs because they did not require specific vocational preparation. This time, researchers included indicators concerning the judicial outcome of the applicant's encounter with the criminal justice system. These outcomes ranged from being found not guilty, serving a one-year suspended sentence, and serving a one-year prison term.

The results indicate that people characterized as criminal offenders did encounter discrimination in the job market. However, the type of crime allegedly committed and the judicial outcome affects the magnitude of this stigma. Thus, a crime against a person appears to be more disqualifying than other types of crime. Of the applicants accused of a crime, those found not guilty were preferred the most, followed by those receiving a suspended sentence. Those who served a one-year prison term were least preferred.

Sampson and Laub (1993) investigated the cumulative effect of incarceration during three chronological stages for a cohort of young adults in the 1950s². They

² Sampson and Laub analyzed data from Sheldon and Eleanor Glueck's *Unraveling Juvenile Delinquency* (1950). From 1940 to 1965, the Glueck's research team collected data on 500 delinquent and 500 non-delinquent white ethnic males born between 1924 and 1935 living in

examined the effect of incarceration from adolescence (under age 17), through young adulthood (ages 17-25) and finally adulthood (ages 25-32). Their results indicated that as time served in juvenile and adult correctional facilities increases, later job stability decreases regardless of prior record and unofficial deviance. The delinquent boys incarcerated for a longer period of time had trouble securing stable jobs as they entered young adulthood compared to delinquents with a shorter incarceration history.

For the men between ages 25-32, the length of incarceration in both adolescence and young adulthood has significant negative effects on job stability, controlling for juvenile crime and deviance, adult crime and excessive drinking as a young adult. Based upon these findings, Sampson and Laub discovered that juvenile incarceration has long-term negative consequences for these men, independent of adult incarceration. They attribute this finding to the impact of structural disadvantages (such as, dropping out of high school and employers finding out about their prior incarceration) on the development of employment trajectories for these men. Thus, they conclude that incarceration has a cumulative negative effect because it appears to cut off opportunities and prospects for stable employment later in life (1993:168).

Through the stigma mechanism described above, incarceration leads to longer unemployment spells. Typically, ex-offender work histories tend to consist of short periods of labor force participation coupled with longer periods of joblessness. As a result, employers may be reluctant to hire individuals with numerous spells of unemployment and major time gaps in their employment history, partly because these characteristics signal to the employer that the job seeker has been incarcerated (Holzer 1996). Sampson and Laub discovered that some of the Glueck's research subjects mentioned the negative effects of criminal records on securing and maintaining

Boston. The boys in this sample were matched on a case-by case basis according to age, race/ethnicity, intelligence and neighborhood socioeconomic status.

employment in their life histories. These men lost several jobs when employers discovered their criminal record. In addition, one man reported in the narrative data that the police came to his place of work and questioned him as a suspect for recent crimes under investigation (1993:215). These anecdotes suggest that individuals whose criminal behavior leads them into prison have markedly lower employment rates in the future than those who do not commit crimes.

Overall, the stigma associated with incarceration may have severe consequences on employment and earnings outcomes for ex-offenders. Employers tend to view criminal conviction and incarceration as signs of worker unpredictability and mistrust (Waldfoegel 1993). The stigmatization of a criminal background makes ex-offenders unattractive workers even for low-skilled jobs. Based upon this literature, I argue that the stigmatization of incarceration leads to longer periods of job search, fewer employment opportunities and lower earnings.

2.3 Mechanism 2: Human Capital

Human capital theory argues that individuals make investments in their occupational futures through educational attainment, general experience in the labor market and specific experiences with current employers. Education is a source of specific skills (e.g. literacy or numeracy) and the general ability to learn new skills. People with more education are expected to have advanced skills and a higher capacity to learn new skills. General labor market experience provides individuals with an opportunity to learn how people function in workplaces. In the workplace, individuals learn general skills such as, how to follow orders, how to work with others and good work habits. Experience with the current employer is interpreted as a proxy for firm-specific skills that are needed to successfully accomplish the work of the firm. For

instance, individuals are trained to perform specific tasks associated with work processes (Tomaskovic-Devey, Thomas and Johnson 2002).

Employers consider individuals with more human capital as attractive employees because their skills can be used to yield superior productivity. Individuals who make human capital investments are more likely to be hired and to receive higher wages for their labor than job seekers that lack marketable job-related skills (Becker 1964). Overall, individuals with more human capital are expected to be more productive employees in the short and long term (Tomaskovic-Devey, et al. 2002).

An underlying assumption of the human capital model is that human capital investment is voluntary and based upon choices made by individuals. Instead, a more sociological view of the human capital model suggests that human capital accumulation is a social process (Tomaskovic-Devey, et al. 2002). For example, parents make decisions concerning the education attainment of their children. There is also variation in parental access to cultural and educational resources. In turn, the access to these resources may influence the development of a child's cognitive ability as well as educational success (Farkas 1996). Likewise, the idea that the accumulation of labor force experience, job tenure or on-the-job training results from individuals making choices is not compatible with the way the labor market works. For example, the evaluation of an individual's work experience, job tenure or on-the-job training may be strongly influenced by the employer's reaction to the job seeker. Therefore, finding a job is partly about job search effort, the employer's evaluation of the job seeker and the social interaction between the employer and the job seeker (Tomaskovic-Devey, et al. 2002).

In this study, I argue that the human capital model is based on a social process, so a distinction between *exogenous* and *endogenous* human capital acquisition must be made. Education and cognitive skills are examples of exogenous human capital, which

are forms of human capital largely acquired outside and prior to labor market activity. Other types of human capital such as work experience, firm and job tenure and on-the-job skill acquisition are clearly endogenous to the labor market. That is they represent the joint behavior of job seekers, employers and even co-workers (Tomaskovic-Devey, et al. 2002). Specifically, the acquisition of firm-specific skills in terms of on-the-job training are based on a joint investment that requires cooperation from the employer, the individual worker and the co-workers responsible for handling the training (Tomaskovic-Devey and Skaggs 2002).

Research suggests that exogenous and endogenous human capital accumulation contribute to racial/ethnic inequality throughout the career. Longitudinal research on race/ethnic employment opportunities illustrates that there are differences in the accumulation of labor market experience, (i.e., endogenous human capital) over the life course. Tienda and Stier (1996) found that inner city African and Mexican American fathers acquired less employment experience over their life course than their white counterparts. Their results also show that Black fathers consistently exhibit the lowest experience levels up to age 39. In addition, African American and Puerto Rican men accumulate greater experience deficits between ages 18 to 45 than their white counterparts. These work experience deficits accumulate over the life cycle and inhibit the odds of stable labor force participation in later years. They conclude that racial and ethnic disparities in accumulated work experience reflect not only differential responses to labor market opportunities, but also unequal barriers to jobs through employment discrimination.

Likewise, Bratsberg and Terrell (1998) studied the sources of differences in wage growth between young African American and white terminal high school graduates. Using panels of young males drawn from the NLSY for the years 1979-1991, they addressed racial differences in returns to general labor market experience and job

tenure (i.e., endogenous human capital) across races. They found that African American workers received far lower returns to general experience than white workers and that the wage gap grows with the number of years of labor force experience. Ordinary least squares estimates predict that a white worker will receive 22% cumulative wage growth from five years of general experience, while a comparable African American worker receives only 11.9% cumulative wage growth for five years of general experience.

Next, Bratsberg and Terrell examine the returns to tenure for these workers. They sum the tenure and work experience effects together to get an estimate of total wage growth for workers who stay on a single job. After being employed for five years on a single job, OLS predicts 43.5% wage growth for a white worker and only 32.5% wage growth for an African American worker. Bratsberg and Terrell suggest that when compared to white workers, African American workers accumulate less general human capital over time, but roughly equal amounts of firm specific human capital (1998:677).

Bratsberg and Terrell assert that their findings support Lazear's hypothesis (1979) that differences in on-the-job training lead to disparities in wage growth for African American and white workers. Their results imply that on-the-job training given to white workers, but not to African American workers leads to the accumulation of general human capital. When whites change jobs, employers view them as more attractive workers because they have accumulated more general or transferable skills than African Americans. On the other hand, when whites and African Americans remain at the same workplace, African American workers are more likely to have opportunities to secure firm-specific training that pertains to their primary job. For African American workers, it is in their best interest to remain with the same firm to experience wage growth to the extent that white workers do when they move from job to job. Overall, this explanation

indicates that racial/ethnic discrimination in the labor market leads to disparities in endogenous human capital and wages.

In another study, which examines the effect of endogenous human capital on employment outcomes for racial/ethnic minorities, Hsueh and Tienda (1995) argue that two mechanisms are responsible for the inequities among African Americans, Latinos and whites. First, they suggest that employers sort African American and Latino workers into jobs that are characterized by unstable employment trajectories. Second, they assert that discrimination in terms of the unequal compensation of similarly-endowed workers produces unequal earnings among comparably skilled men. They argue that these two mechanisms lead to employment instability. Relative to whites, minority workers experience more frequent labor force transitions and longer periods of joblessness, such as being a discouraged worker, an unemployed worker or selecting not to participate in the labor market. Hsueh and Tienda argue that employment instability is an important process of stratification because frequent labor force transitions such as joblessness and underemployment produce unstable income flows. Thus, the greater representation of African American and Latino men in these unstable work trajectories produces race/ethnic differences in earnings and perpetuates a differential reward system associated with minority group status.

The following series of cross-sectional studies examine the extent to which exogenous human capital shapes the earnings trajectories for racial/ethnic minorities. For example, Cotton (1993) investigated earnings disparities among non-Latino white, non-Latino black, Latino black and Latino white males. Using data from the CPS, the author found a pattern of earnings discrimination in favor of non-Latino whites. Specifically, the data indicate that 40% of the earnings differentials between non-Latino whites and Latino blacks and non-Latino whites and Latino whites can be attributed to differences in exogenous human capital and 60% to the combination of minority

disadvantage and white advantage endogenous to the labor market. For non-Latino white and Latino white earnings differentials, over 65% can be explained by differences in exogenous human capital with the remainder accredited to either white advantage or minority disadvantage in the labor market.

Mason (1999) examines interracial wage differentials for white, African American and Latino males. Using the Panel Study on Income Dynamics (PSID), he obtains cross-sectional estimates of white-African American and white-Latino wage differentials. The results indicate that the mean wage for African American men is 68% of the mean wage for white men (\$8.61 per hour and \$12.70 per hour) while Latinos earn 65% of the mean white male wage (\$8.20 per hour and \$12.70 per hour). African Americans and whites enjoy marginal rates of return to education of 8% compared to 2% for Latinos. Mason contends that the results suggest strong evidence of preferential treatment for whites within competitive labor markets.

In their examination of male cohorts that entered the labor force from 1940 through 1990, Thomas, Herring and Horton (1994), have shown a consistent pattern in which African American-white earnings inequalities were lowest when these men were between the ages of 20-29. As these cohorts reached the ages of 30-39 and 40-49, the African American-white earnings inequalities grew rapidly. This period of growth corresponds to the first ten to twenty years of the career. By the time these cohorts reached the ages of 50-59 and 60-69, the African American-white earnings gap levels off but still exist for these men. The results suggest that the African-American-white wage gap is attributed to the cumulative effect of discrimination over the lifecourse.

Studies reviewed here demonstrate the importance of making the theoretical distinction between exogenous and endogenous human capital and its impact on the career trajectory for racial/ethnic inequality. These studies indicate that exogenous and endogenous forms of human capital provide important explanations concerning

race/ethnic differences in employment and earnings trajectories. Outside the labor market context, exogenous human capital in the form of educational attainment or cognitive skill, along with the status attributes of prospective jobseekers may affect the extent to which employers' sort workers into jobs with stable employment trajectories. Within labor markets, endogenous human capital accumulation grows across the career. The differential growth of endogenous human capital leads to race/ethnic gaps in earnings. The accumulation of endogenous human capital is an important explanation of racial and ethnic earnings inequality (Tomaskovic-Devey, et al. 2002). In the following section, I discuss the link between the human capital mechanism and incarceration.

How does incarceration reduce human capital accumulation?

Incarceration undermines the human capital investments of ex-offenders. Imprisonment prevents young men from acquiring work experience by reducing time in the labor market. Due to being absent from the labor force, ex-offenders do not have opportunities to acquire marketable general or firm-specific skills that will enable them to compete with their non-offender counterparts. In the open labor market, ex-offenders are constrained by work experience deficits that erode job skills, future employment and wage growth (Western, Kling and Weiman 2001; Waldfogel 1994).

Employers believe schooling experiences provide workers with general behaviors and orientations (e.g., meeting deadlines and behaving in a disciplined manner) they need for working in hierarchical settings (Bills 1988). For some young men, their educational experiences may not have fostered the development of general behaviors and skills employers find desirable. As a consequence of doing poorly in school, young males may be more likely to embrace risk taking behaviors that lead to delinquency and subsequent criminal activity (see Hirschi 1969; West and Farrington 1973; Hagan and McCarthy 1996). Engaging in these behaviors may result in institutionalization as

juveniles and periods of incarceration during adulthood (Sampson and Laub 1993). Thus, failing in school followed by subsequent incarceration may limit the human capital accumulation of ex-offenders³. Having fewer opportunities to accumulate human capital places these individuals at a disadvantage because they lack general and job specific skills that employers believe job seekers learn while in school.

As a consequence of their imprisonment, the erosion of human capital creates real deficiencies in the productivity of ex-offenders. Incarceration may erode the job skills of ex-offenders. Time served in prison limits the acquisition of work experience that is obtained on the open labor market. Nagin and Waldfogel (1993; 1995) found that criminal conviction reduces access to “career jobs.” These jobs offer the prospect of stable long-term employment. Ex-offenders are relegated to employment in spot market jobs. Spot market jobs offer little prospect of stable employment or earnings growth. These jobs tend to be unstable and have flatter wage trajectories than career jobs. For individuals who are trying to establish a career, Nagin and Waldfogel suggest that a criminal conviction will adversely affect prospects in the career job market. Therefore, incarceration can interrupt young men’s transitions to stable career employment (Western 2000).

Freeman investigated the impact of incarceration and probation on the employment of young men. He found “massive long-term effects of having been in jail or on probation on employment” (1992:217). Specifically, men in jail or on probation as of 1980 had lower employment in all succeeding years than other men with comparable characteristics. Freeman found that the average weeks worked in subsequent survey years (1980 to 1987) for men with no criminal involvement ranged from 35.7 to 43.7 weeks. For all men with a criminal record and for African American males separately,

³ Conceptually, the relationship between educational attainment and incarceration may be reciprocal. However, for the scope of this study, I am theorizing that low educational attainment leads to incarceration.

being in jail or being on probation greatly reduces the average weeks worked. For the entire eight-year period, incarceration in 1980 reduced subsequent weeks worked by 27% for African American men and 22% for all men. Likewise, probation reduced subsequent weeks worked by 7% for African American men and 9% for all men.

Uggen (1999) address the question of whether the provision of high quality jobs reduces criminal behavior among released offenders. Uggen found that African American male ex-offenders were less likely to find high quality or low quality jobs than non-African Americans. In this sample, African American men had long arrest records, lower levels of education and higher incidence of substance abuse. These factors in combination reduced the probability of employment for African American men.

Western and Pettit (1998; 1999) examined employment inequality for white and African American male high school dropouts. Using the *Current Population Survey*, they estimated employment population ratios for African American and white unskilled men. They suggest that research on employment inequality often neglects the influence of incarceration on joblessness. Official tabulations of the employment-population ratio only count the non-institutionalized population. The white-African American employment population ratio is defined as the proportion of working-age African Americans who hold jobs divided by the proportion of working-age whites who hold jobs. In their estimation of the employment-population ratio, Western and Pettit include the number of African American and white prison and jail inmates. They discovered that when the employment population ratio incorporates imprisonment rates, the African American-white employment inequality ratio is as much as 40% higher than standard unemployment comparisons (by definition, unemployment estimates exclude prisoners). Western and Pettit found that including prisoners in the calculation of the employment-population ratio has an effect on the employment ratio for African American men. However, this adjustment has little aggregate effect on employment rates for white men. Based upon

the adjustments made for imprisonment, Western and Petit conclude that incarceration contributes to a significant decline in the employment rates of young unskilled African American men during 1982-1996. Specifically, the findings of this study suggest that by including imprisonment estimates, the employment and earnings inequality gap between African American and white men is larger than current estimates. Therefore, imprisonment conceals economic inequality by excluding large numbers of poor men from official accounts of the labor market.

Western (2000) addresses the consequences of incarceration for earnings and inequality. While Western acknowledges that the negative effect of imprisonment on wages is reciprocal, because men with few economic opportunities may turn to crime, he is interested in the causal relationship: incarceration \rightarrow wages. Using the (NLSY), Western compares the earnings of white, African American and Latino ex-offenders to the general population. The OLS estimates indicate that ex-inmates earn about 7% less than men who have not been incarcerated. Once the individual level fixed effects are controlled, he found that ex-offenders earn 19% less than their counterparts who have never served time in prison (2002: 536). However, once Western controlled for work experience, the earnings penalty of incarceration reduces by half. Among whites, controlling for work experience eliminates the negative impact of incarceration. After controlling for work experience, African Americans and Latinos, earn about 10% less than those who were never incarcerated. When compared to the OLS models, the fixed effects models attribute much less of the gap between pre- and post-incarceration wages to differences in work experience. Western contends that this residual effect may reflect social stigma, eroded job skills or a lack of social networks⁴.

⁴ Western controls for type of industry in his earnings models. By controlling for industry, Western may be over-controlling the models because he estimates measures of endogenous human capital while controlling for potential industry effects which are also endogenous to the labor market.

Since the pre-prison employment experiences and education levels of ex-offenders are low relative to non-offenders, imprisonment intensifies skill deficiencies of ex-offenders⁵. When ex-offenders seek employment, they face the difficulty of locating skill-appropriate jobs. Subsequently ex-offenders tend to have work histories characterized by numerous spells of unemployment. The lack of human capital makes ex-offenders less attractive to employers.

Clearly, obtaining a job becomes a challenge for ex-offenders. Generally, ex-offender work histories are characterized by few marketable job skills, extended spells of unemployment and low levels of education. These factors make ex-offenders undesirable job seekers (Liker, 1982; Western and Pettit 1999). When ex-offenders obtain employment, they are relegated to jobs where they do not have opportunities to develop general (transferable) or firm-specific human capital. Therefore, ex-offenders tend to obtain low skill/low wage jobs that are most likely to be affected by economic downturns leading to spells of unemployment (Lynch and Sabol 2001).

2.4 Mechanism 3: Social Capital

Social capital results from being able to secure benefits through membership in social networks and participation in groups (Portes 1998). Within this framework, social networks are constructed through investment strategies and serve as a reliable source of other benefits. Through social capital, individuals gain direct access to economic resources. These social connections usually provide individuals with information about employment, mobility through occupational ladders and entrepreneurial success (Lin 2000).

⁵ Western constructs a sub-sample of at-risk respondents who have a high risk to criminal behavior. In the fixed-effects models for this group, Western controls for prior incarceration before age 18 and whether or not these men had ever been charged with a crime before age 18.

Typically, when examining the labor market outcomes of jobseekers, researchers focus on supply side explanations, adopting the point of view of the job seeker and their social contacts (see Granovetter 1995). Studies that adopt the perspective of the job seeker examine the importance of the quality of information individuals share within their social networks. Furthermore, the racial/ethnic composition of the social group may influence access and quality of information that is shared among social network members.

Social groups have different access to social capital because of their advantaged or disadvantaged structural positions and social networks. The inequality associated with social capital offers fewer opportunities for minorities to obtain better social resources (Lin 1999). Consequently, the types of networks minorities have access to may not result in better educational or employment opportunities (Portes 1998).

In this section, I discussed the impact of race/ethnicity on the accumulation of social capital. Recent ethnographic research discusses the impact of social capital on the lives of low-income African American men (Young 1999). These men were between the ages of 20 to 25 and they lived in West Side Chicago community. One of the major themes in their life history accounts was the decline of their community once the manufacturing jobs disappeared (see Wilson 1978; 1987; 1996). This socioeconomic change affected the low-income community's infrastructure. The presence of banks, stores, community groups and informational organizations diminished in this community. Also, there were no major employment sectors in the community. Social capital was scarce for these African American men. They reported having few strong ties to people who worked consistently in secure and well paying jobs, and few experiences with employment. The men did not have opportunities to develop social networks, which led to employment or furthering their education. The poor quality of education they received prevented them from obtaining "good" jobs and establishing dense social networks

outside the community with resources. Thus, their lack of social capital decreased the opportunity for social mobility and diminished their opportunities in the labor market (Young 1999:208). Next, I address the issue of how the mechanism of social capital is linked to incarceration.

How does incarceration undermine social capital accumulation?

Incarceration can affect an inmate's access to social networks that will provide them with job referrals and employment opportunities upon their release from prison (Hagan and Dinovitzer 1999). Within prisons, particularly facilities characterized by significant gang activity, inmates may establish social connections with groups or individuals who can provide them with further opportunities to commit crime upon release (Irwin and Austin 1997). If prisons are viewed as being criminogenic, then upon release inmates may become entangled in peer networks that connect frequently with the criminal justice system, but rarely with opportunities for stable employment (Sullivan 1989).

Furthermore, incarceration undermines social networks that provide opportunities for stable long-term employment. The peer networks of ex-offenders who live in poor communities usually do not transfer knowledge concerning mobility opportunities. These men are isolated from the types of social and informal networks that link other groups to job opportunities (Wilson 1987)⁶. In addition, anecdotal evidence concerning access to trade jobs suggests that people acquire these jobs through referral networks. The stigma associated with incarceration makes ex-offenders undesirable for entry-level or

⁶ One may argue that white men with a criminal record do not have access to social networks that can lead to employment opportunities. According to Sampson and Wilson (1995), the neighborhoods in which poor whites live are qualitatively different from the neighborhoods in which poor African Americans live. Thus, I argue that white ex-offenders are more likely to have access to people who have connections to employment opportunities outside their residential community.

union jobs that may even require high levels of trust (Nagin and Waldfogel 1993; 1995; Western 2000). Thus, these ex-offenders may not have developed social ties with individuals that can enhance their knowledge concerning employment opportunities.

As a result of being imprisoned, social ties to people who work consistently in secure good paying jobs are weakened. Consequently, former inmates may become isolated from legitimate jobs when they re-enter the labor market. Thus, the content of peer networks influences whether former inmates learn about job opportunities or have access to job referral networks when seeking employment (Western, Kling and Weiman 2001).

Overall, incarceration weakens the social capital of ex-offenders in terms of the quality of social networks. Poor quality social networks may only provide ex-offenders information concerning low-skilled and low-wage jobs. As a result of only having access to poor quality social networks, ex-offenders may not become attached to the legitimate labor market. However, good quality social networks may become sources of information about career jobs that are characterized by stability and higher wages. These ties can enable ex-offenders to become successfully re-integrated into the legitimate labor market.

2.5 Incarceration and Disruption of the Career Trajectory

Western examines the impact of incarceration on the career trajectory of young men. In his application of the life course perspective, Western argues that incarceration is a *turning point* that disrupts important life *transitions* (such as graduating from high school, marriage) for individuals and has negative consequences for employment opportunities and earnings trajectories. Incarceration creates a variety of challenges for those who experience it. Being incarcerated stigmatizes ex-offenders and intensifies the “re-entry” problem: the task of reintegrating oneself into mainstream society (Western

and Beckett 1999). As a result, incarceration disrupts the accumulation of human and social capital, which affects not only the ability to gain stable employment but also the earning potential of individuals throughout the career (Western and Pettit 1998; 1999; Western 2000; Western 2002).

Overall, incarceration is likely to disrupt the career trajectory of ex-offenders. Three plausible causal mechanisms link the experience of imprisonment to the likelihood of unemployment, less work experience and low wages. The effects of these mechanisms suggest that having a criminal record may be a hindrance to obtaining legal work. Thus, the experience of being incarcerated has a potentially devastating impact on the economic opportunities of ex-offenders.

2.6 Theoretical Model

The theoretical discussion presented thus far suggests that three mechanisms may mediate the incarceration-labor market outcome relationship. Figure 2.1 offers a visual representation of the relations that are examined, at their most general level. My intent is to specify ways in which these mechanisms explain the incarceration-earnings relationship and leads to differential labor market outcomes for race/ethnic groups.

According to the illustration below, I expect incarceration and race/ethnicity to affect stigma, human and social capital accumulation and influence labor market outcomes. Although the argument has been made that labor market outcomes influence the rate of crime and subsequent imprisonment (Crutchfield 1989; Crutchfield and Pitchford 1997), this relationship is not directly theorized in this study. In this study, I am interested in how race/ethnicity and prison status shape the career trajectory.

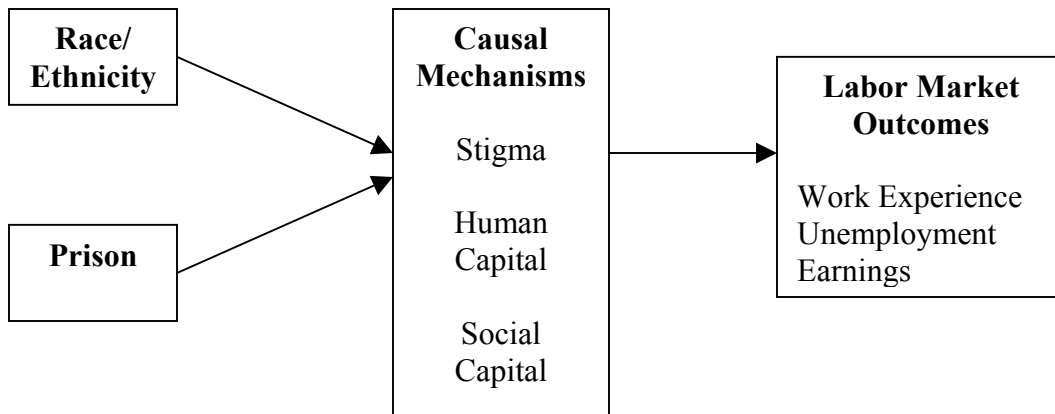


Figure 2.1. General Theoretical Model of the Interrelations between Incarceration, Race/Ethnicity and Labor Market Outcomes

2.7 Summary

In this chapter, I developed a theoretical model of the impact of incarceration on labor market outcomes and career trajectories for racial/ethnic groups. After introducing three causal mechanisms, stigma, human and social capital, I use them to explain how incarceration disrupts the career trajectory. Understanding the impact of these mechanisms is particularly important for illustrating how inequality affects wage profiles, employment opportunities and work experience of ex-offenders.

CHAPTER 3

DATA AND METHODS FOR INDIVIDUAL LEVEL ANALYSES

3.1 Introduction

In this chapter, I describe the data, variables, models and modeling strategy I use to investigate the impact of incarceration on labor market outcomes for individuals. For the purpose of this study, earnings is the primary outcome variable. However, before I assess the consequences of incarceration on earnings, I also investigate how incarceration influences ex-offenders' ability to accumulate human capital. Specifically, I will examine models in which cumulative unemployment and cumulative work experience are outcome variables. The examination of these labor market characteristics allow me to discover the extent to which changes in human capital acquisition associated with imprisonment affect the earnings trajectory of ex-offenders throughout the career.

3.2 Data

The data used in this study are drawn from the Public and Restricted Use files of the National Longitudinal Survey of Youth (NLSY); a panel study originally of 12,686 persons that began in 1979. The NLSY was created by the Bureau of Labor Statistics (BLS) to collect data on the labor force experiences, labor market attachment and investments in education and training of young adults. These respondents were interviewed annually over a 15-year period. Since 1996, the respondents began being interviewed biennially. As of the 1998 interview, these men were between the ages of 35 and 41 years old. Retention rates of eligible respondents for this large panel study were close to 90% for the first sixteen rounds of interviews and 85% for interview rounds 17 and 18 (NLS Handbook 2001). The NLSY sampling design enables social scientists to analyze the disparate life course experiences of various populations. In this survey, African-Americans, Latinos and

economically disadvantaged white youths were over-sampled (Center for Human Resource Research 1994). In addition, the restricted use NLSY data contains geocodes for all survey years that can link individual records to measures of local labor market opportunity.

The longitudinal nature of the data offers a significant advantage to understanding how the consequences of incarceration, racial/ethnic inequality and labor market experiences unfold during the career. This panel survey allows me to develop cumulative measures of work experience and unemployment that are more sensitive than those typically analyzed in cross-sectional research designs (see also Tienda and Stier 1996; Wilson Tienda and Wu 1995). For example, in cross-sectional studies, the effects of experience on earnings are often computed by comparing older and younger individuals. However, using longitudinal data allows for the assessment of returns to actual experience as individuals accumulate it (England, Farkas, Kilbourne and Dhou 1988). In addition, using longitudinal data allows me to use a fixed effects model approach to control for all unmeasured stable individual traits. The large sample size permits me to examine how incarceration and spatial variation may affect the career trajectory.

While the longitudinal structure of the data provides an advantage concerning the study of individual earnings, the NLSY has some limitations. The age distribution of the pooled-cross-section data indicates that 87% of the respondents are between the ages of 18 to 33. Although most racial/ethnic divergence in earnings occurs during the mid-thirties, age based earnings inequalities tend to peak in the late 40s (Thomas et al. 1994). Therefore, the respondents are not followed long enough to track expected career based inequality in its entirety. Subsequently, the small sample size of respondents between the ages of 34 to 41 may affect estimates of labor market outcome variables. The absence of respondents in their late 40s means that additional inequalities have yet to occur.

Another limitation of this data is that the job tenure measure is function of tenure within the respondent's current job, as opposed to firm-specific tenure, which is typically

investigated in earnings research¹. Since wages often rise with job changes within firms, I miss the within firm tenure effects with a measure of job tenure. While the development of a cumulative measure may not be an issue for most of the respondents who have worked in the same job for the same firm over time, this lack of information may be an issue for respondents who have worked in several jobs for several employers. In addition, job tenure is also more likely to be valued more for whites than minorities. As a result of only having a measure of job-specific tenure, I am not able to obtain a precise measure of firm tenure influence on earnings. For this reason tenure receives less empirical attention in the models to follow. Despite the limitations associated with the NLSY, the longitudinal nature provides opportunities for researchers to learn more about labor market dynamics that occur during the lifecourse.

3.3 Sample

For this study, the specific sample population under investigation consists of 6,403 African American, Latino and white men who were 18 years or older in an observation year². I arranged the longitudinal data into a pooled cross-section time series (person-period) format in which the unit of analysis is an individual in a particular year. A record for each completed interview was generated. The records began with the 1979 interview and continue until the end of the study period–1998. Each person in the sample had one record for each year. The person-period data set contains 69,133 records of men with jobs and earnings in the survey year. On average, each person contributed 10.8 observations to the

¹ An example of tenure in the current job is an individual working as a restaurant manager at the local Wendy's for two years. An example of firm-specific tenure is the same individual has worked in a number of jobs at Wendy's for eight.

² Examining the impact of incarceration on the employment opportunities and earnings of female ex-offenders is also important. Since men comprise over 90% of the U.S. prison population, even a very large sample like the National Longitudinal Survey of Youth (NLSY) produces only a few female ex-offenders. In the NLSY, only 3% of the female respondents had ever been incarcerated, compared to 36% of the male respondents. Therefore, I restricted my analyses to only male ex-offenders.

data set. One of the advantages of creating a person-period data set is that individuals do not have to be excluded entirely if they are missing some observations on the dependent variable (Allison 1994). Another advantage of using the person-period format with this data is that I can track changes in respondent's human capital, earnings and other factors that affect career processes over time.

3.4 Causal Order

The fundamental challenge in measuring the effect of incarceration is identification of the causal effect of incarceration itself (Western, Kling, Weiman 2001). Criminological interest in the effect of employment on crime and incarceration suggests that the self-selection of offenders into prison creates severe difficulties for causal inference. According to Gottfredson and Hirschi (1990), individuals with low self-control are at a high risk of committing crime, but they also may have difficulty meeting the obligations associated with stable employment. Based on their theory of self-control, when making causal attributes, models should contain control variables that can account for low productivity and inmate self-selection. On the other hand, the control variables that criminologists associate with low self-control, stratification theorists would argue that differences in these control variables result from structural disadvantage that the poor and minority groups may experience within society.

To account for the self-selection of offenders, I introduced control variables in the models that I estimate which may account for low productivity as well as the structural inequality individuals who enter prison may face. For instance, the models control for years of education and cognitive ability. These two measures attempt to adjust for any type of educational deficits that may be a result of inequity within the school system or associated with low self-control. I also control for current incarceration as a way to ensure that wages do not reflect the immediate loss that may be associated with serving in prison. The fixed

effects models also control for stable unmeasured individual traits such as self-control as well as unmeasured characteristics such as the quality of education that may affect educational attainment.

While the issue of causal order is problematic, I chose to solve this problem by only interpreting and theorizing about the causal link between prior incarceration and future labor market outcomes. Since prior incarceration precedes the labor market outcome in time, I argue that the interpretation of any relation between the two reflects the effect of the prison sentence on future earnings or employment performance. My statistical models include very strong controls for self-selection into prison and employment processes.

3.5 Measures

Since the focus of this study addresses how human capital measures affect labor market outcomes, I classified individual-level measures based upon whether the variables are endogenous or exogenous in their relation to the labor market process. Variables that are *endogenous* to the labor market are affected by the job applicant-employer interaction. For example, wages are endogenous to the labor market because they are influenced by employer's evaluations of workers. *Exogenous* variables to the labor market can be conceptualized as characteristics that workers acquire outside the labor market. For example, educational achievement is treated as exogenous to the labor market because it does not depend on the employer's decision-making process. This distinction permits me to discuss how these human capital measures affect various stages of the labor market process.

Endogenous Variables

Earnings, the primary outcome variable, are measured as the hourly wage reported by the respondent in the calendar year preceding the interview. It will be modeled in a

logged form³. I decided to use the Consumer Price Index (CPI) deflator to calculate earnings in 1983 constant dollars as a way to standardize the hourly wage rate for the respondent's primary job. Outlying observations at the low end of the distribution, less than \$1.00 per hour, and observations greater than \$60.00 per hour were discarded.

Cumulative work experience (a secondary outcome variable) is the sum of the number of weeks respondents reported working during the survey years. The possibility of work experience being highly correlated with age is problematic. To avoid the problem of multicollinearity with age, I constructed a measure I called mean work experience, which is the cumulative weeks worked divided by years in the labor force (see Western 2002).

Based upon the Bureau of Labor Statistics (BLS) definition, an unemployed person is an individual who had no employment during the reference week and were actively seeking work. These people were available for work, except for temporary illness and had made specific efforts to find employment sometime during the 4-week period ending with the reference week. Persons who were waiting to be recalled to a job from which they had been laid off need not have been looking for work to be classified as unemployed (Bureau of Labor Statistics 2002). Cumulative unemployment (a secondary outcome variable) is the sum of the number of weeks respondents reported being unemployed during the survey year and all previous years. According to the Bureau of Labor Statistics definition, a person who is currently incarcerated cannot be counted as an unemployed person, because they are considered part of the institutionalized population. When creating the variable cumulative unemployment for an individual who has been incarcerated, this variable does not include the number of weeks the individual spent incarcerated. Tenure is measured in terms of the number of weeks respondents reported being employed in their current job.

³ Only positive earners will be included in the analyses. Only men who never worked across the whole period will be excluded from these analyses. These men are not participating in the labor market at all, rather than missing from a single year's analysis.

Exogenous Variables

In the NLSY, an annual residence item provides the main question that addresses the time-varying nature of incarceration for respondents. This question identifies if respondents are being interviewed in prison or jail. This item measures incarceration with error because it only obtains the respondent's residence status at the time of the interview. Therefore, some prison or jail sentences less than 12 months are under-observed. However, Western (2002) argues that prison sentences typically exceed 12 months, and are observed with certainty. Also he reports that error due to survey non-response is small because response rates do not differ greatly by incarceration status.

Following Western (2002), prior incarceration is a dummy variable that records whether the respondent ever previously served time in prison or jail. The prior incarceration variable equals 1 if the respondent recorded an interview in a correctional facility in year $t-1$ or earlier, and 0 otherwise. This measure of prior incarceration provides information required to estimate the effect of incarceration after release.

I chose to measure prior incarceration as a dichotomous variable as opposed to developing a count variable based upon the total number of correctional interviews given by a respondent. A count variable of the total number of correctional interviews might identify serious offenders who have served multiple spells in prison. However, the problem with using this variable is that only a few respondents had ever been to jail, and out of those few individuals, an even smaller number would be considered multiple offenders. To see if the estimates of the average effect of incarceration on the labor market outcomes are affected by using the count variable versus the dichotomous variable, I ran separate models using both measures in the analytic chapters. Estimates derived from using the dichotomous measure of prior incarceration are more stable and lead to the development of better-fitting models.

In addition, I also created another dummy variable, current incarceration. This variable measures current incarceration status. Current incarceration equals 1 if respondents were interviewed in prison or jail in year t , and 0 otherwise. While this variable provides no information about the post-release effect of incarceration, Western (2002) argues that it captures the earnings loss while in prison or jail or a decline in earnings just before incarceration. Western suggests controlling for current incarceration because this prevents confounding the post-release effect of prior incarceration with lost earnings during incarceration.

Age is measured as the respondent's current age at the time of the interview. Race/ethnicity of the respondent is based upon the respondent's self-identification. Education is measured in terms of the highest grade completed by respondents. Cognitive skill, a measure of educational quality, is based upon the Armed Forces Qualification Test (AFQT). This test consists of 10 subtests that address specific skill components. Following Farkas et al. (1997), I used four of the AFQT subtests: test of word knowledge, paragraph comprehension, arithmetic reasoning and math knowledge to construct a measure of cognitive skill. These tests were administered to the entire sample in 1980. Each of the four tests were averaged and the average was converted to a Z score. The resulting scale has a reliability (Cronbach's α) of 0.926. Because labor market experiences are expected to vary as a function of both education and cognitive skill, and the prison population tends to be low on both attributes, these serve as important control variables in the models estimating the consequences of prison time.

Control Variables

In this study, I control for the non-random selection of men into prison and jail. I accomplish this in two ways. First, in the models several sources of self-selection are

controlled explicitly in the models. Second, the fixed effects models capture the influence of time-invariant observed and unobserved characteristics of respondents. The fixed effect controls for the influence of omitted variables that may be correlated with the predictor variables (Western 2002).

Since criminal offenders tend to have little human capital (Sullivan 1989), I control for human capital characteristics such as years of schooling, and work experience. According to Sampson and Laub (1993), a social attachment such as marriage is important for ex-offenders because as an institution marriage is a type of informal social control. In these models, marital status is a dummy variable that equals 1 if the respondent reports being married during the survey year, 0 otherwise. Since ex-offenders tend to have low levels of labor force participation and work in low wage, menial jobs, I control for the total number of hours that a respondent works. The numbers of hours ex-offenders work play an important role in determining their wages and the slope of their wage profile throughout the career. This variable is measured by hours worked per week. In addition, I control for current school enrollment because if ex-offenders are enrolled in some type of college or vocational program, then this enrollment affects their potential earnings across the career. Current school enrollment is a dummy variable that equals 1 if the respondent is enrolled in college or vocational school, 0 otherwise. The variables concerning the location of the respondent's residence are equal to 1 if the respondent reports living in the suburbs or the central city. The reference category is rural residence. These variables that control for the respondent's residence capture the gross influence of geographic location on labor market outcomes.

In Western's (2002) analysis he controls for four additional variables that are possible determinants of earnings or result in selectivity bias for going to prison. In these models, I do not control for type of industry, geographic region, parent's socioeconomic status (SES), or prior drug use. Since the distinction between exogenous and endogenous human capital is an integral part of my analysis, controlling for industry, in particular would

result in over-controlling the models because type of industry is an endogenous indicator, achieved inside the labor market. Furthermore, type of industry as an endogenous status shapes earnings, unemployment and work experience trajectories across the career. I did not control for geographic region for two reasons. First, the use of this aggregate level measure would not allow me to capture the effect of the influence of local labor markets on earnings trajectories. Second, in the preliminary analysis, I constructed a dichotomous dummy variable for region (south/non-south). The variable south was not statistically significant; as a result I decided to eliminate this control variable. The concept of parental socioeconomic status is operationalized in the NLSY as variables concerning are mother and father's education. Many respondents did not answer the question concerning father's educational attainment. However, they did provide information concerning their mother's education. The drug use questions were originally introduced in the 1980 crime module of the NLSY. These questions were asked periodically throughout the years and the types of drugs people were asked about changed over time. For instance, respondents were questioned about marijuana and heroin. In the early 1990s, respondents were asked about crack use. In preliminary analyses, I found that the previously mentioned control variables were not statistically significant in the fixed effects models. Upon removing them from the model, the substantive conclusions did not change. Therefore, these variables were not included in the models presented in the analytical chapters.

3.6 Descriptive Statistics

In Table 3.1, I present information pertaining to the number of men who were interviewed in jail/prison. This table presents the number of men by race/ethnicity who have been incarcerated during the years of the NLSY survey. The total number of men in the NLSY sample is 6,403. According to Table 3.1, 30% of the men in the NLSY sample have a prison record. When examining the total number of men who have been surveyed in

jail/prison by race/ethnicity, the table illustrates that African American men are more likely to have had an interview conducted while they were incarcerated. Specifically, 59% African American men had been interviewed in a correctional facility, compared to 17.2% Latino men and 24% white men. This finding suggests that being incarcerated has become commonplace among African American men.

In Table 3.2, I present descriptive statistics of selected variables. Within this table, comparisons can be made between ex-offenders and non-offenders, and ex-offenders by race/ethnicity. On average, ex-offenders hourly wages are considerably lower than non-offenders \$5.82 and \$8.31 respectively. Ex-offenders have fewer weeks of cumulative work experience (320.78 weeks) than non-offenders (407.27 weeks). Ex-offenders also have longer periods of being unemployed thorough out the career (88.59 weeks) than non-offenders who have an average of 36.37 weeks of unemployment. In terms of cognitive skill and educational attainment, the means for ex-offenders were significantly lower than the means reported for non-offenders. In the ex-offender sample, the mean cognitive skill score was -0.49, while the score for non-offenders was 0.36. Non-offenders have higher cognitive skill scores than ex-offenders. The mean value for years of education for ex-offenders was 10.71 years, compared to the non-offenders' mean of 12.92 years.

Among ex-offenders, whites have an hourly wage of \$6.25 compared to \$5.78 for Latinos and \$5.24 for African Americans. White ex-offenders have more weeks of cumulative work experience (332.12 weeks) when compared to Latinos (326.75 weeks) and African Americans (303.38 weeks). When examining average weeks of being unemployed throughout the career, African American ex-offenders spend more weeks out of work (102.70) than Latinos (87.15 weeks) and whites (78.81 weeks). On average, white ex-offenders score higher on the cognitive skills assessment (-0.27), indicating that whites scores approach the sample mean compared to Latino (-0.50) and African American ex-offenders (-0.79). White ex-offenders have a mean of 10.40 years of education compared to

11.14 years for African Americans and 10.70 years of education for Latinos. The results displayed in Table 3.2 illustrate that ex-offenders accumulate less human capital than non-offenders. Among ex-offenders, this lack of human capital is particularly problematic for African American ex-offenders, although they have higher levels of education than Latino or white ex-offenders. Within each race/ethnic category, on average, non-offenders have higher wages and better human capital than ex-offenders for every comparison in Table 3.2.

Table 3.1. Total Number of NLSY Men Who Were Surveyed in Jail/Prison during 1979-1998.

Survey Year	Total Number of Men	Latino	African American	White
1979	25	4	10	11
1980	59	8	29	22
1981	65	10	32	23
1982	87	15	37	35
1983	100	13	59	28
1984	98	16	44	38
1985	101	20	49	32
1986	112	22	59	31
1987	124	21	68	35
1988	122	14	74	34
1989	126	15	74	37
1990	124	14	74	36
1991	117	22	80	15
1992	129	23	93	13
1993	135	25	93	17
1994	141	30	90	21
1996	140	34	85	21
1998	128	27	83	18
N=1933		N=333	N=1133	N=467

Note: The total number of men in the NLSY sample is 6,403.

Table 3.2. Means and Standard Deviations of Selected Variables for Ex-offenders and Non-offenders by Race/Ethnicity.^a

	Total Sample	Latinos	African American	White
(Person Year)	(2,869)	Ex-offenders (545)	Ex-offenders (1463)	Ex-offenders (861)
Hourly Wage	5.82 (2.78)	5.78 (1.77)	5.24 (2.18)	6.25 (3.92)
Cognitive Skill	-0.49 (0.48)	-0.50 (0.35)	-0.79 (0.32)	-0.27 (0.66)
Education	10.71 (1.23)	10.70 (0.97)	11.14 (0.97)	10.40 (1.63)
Hours Worked	31.88 (15.88)	30.46 (11.01)	28.75 (13.24)	34.36 (21.32)
Cumulative Work Experience	320.78 (133.65)	326.75 (93.32)	303.38 (108.33)	332.12 (183.86)
Mean Work Experience	24.00 (7.98)	24.14 (5.45)	22.52 (6.56)	25.00 (10.86)
Job Tenure	66.00 (72.44)	68.07 (56.87)	56.65 (50.00)	72.25 (105.44)
Cumulative Unemployment	88.59 (52.47)	87.15 (34.35)	102.70 (45.48)	78.81 (68.61)
	Total Sample	Latinos	African American	White
(Person Year)	(66,264)	Non-offenders (11,537)	Non-offenders (15,887)	Non-offenders (38,840)
Hourly Wage	8.31 (4.43)	7.70 (2.38)	6.75 (2.53)	8.58 (5.36)
Cognitive Skill	0.36 (0.71)	-0.11 (0.42)	-0.39 (0.44)	0.51 (0.78)
Education	12.92 (2.05)	11.90 (1.33)	12.40 (1.25)	13.08 (2.42)
Hours Worked	38.87 (15.49)	37.94 (9.11)	35.88 (10.95)	39.38 (18.28)
Cumulative Work Experience	407.27 (196.71)	388.03 (115.08)	356.76 (131.29)	416.10 (233.59)
Mean Work Experience	36.37 (10.23)	34.39 (6.30)	31.37 (7.63)	37.26 (11.76)
Job Tenure	165.67 (165.05)	153.51 (93.12)	136.37 (101.00)	170.87 (198.91)
Cumulative Unemployment	34.37 (40.26)	39.66 (25.03)	56.12 (36.79)	30.80 (44.09)

^a Means (standard deviations) reflect the weighted sample. All racial/ethnic differences are significant under the $p < .001$ level.

3.7 Hypotheses

I conceptualize the earnings process for individuals to be mediated by career differences in access to employment. Incarceration reduces employment. Because incarceration is more likely for African Americans, incarceration may contribute to differences in earnings. As a result of not being able to secure employment, ex-offenders do not have opportunities to accumulate endogenous human capital in the same fashion as non-offenders. The lack of endogenous human capital results in ex-offenders experiencing longer spells of unemployment, accumulating less experience and earning lower wages throughout the career. The hypotheses and associated discussions make explicit the degree to which the causal mechanisms that disrupt the career process and create race/ethnic inequality impact the earnings, cumulative unemployment and cumulative work experience for ex-offenders.

H1: Incarceration has a negative effect on earnings.

I hypothesize two mechanisms by which incarceration negatively impacts earnings. First, incarceration reduces the accumulation of endogenous human capital because ex-offenders spend less time in the labor force. Ex-offenders are more likely to work in spot market jobs that provide unstable employment and lower wages. Consequently, jobs of this nature provide fewer opportunities for on-the-job training and developing firm-specific skills. Second, the stigma associated with incarceration decreases the likelihood of gaining employment. Employers tend to view ex-offenders as untrustworthy and unreliable workers. In addition, other employees may be reluctant to work with ex-offenders due to the stigma of incarceration. Based upon these two mechanisms, I predict that wage growth for ex-offenders will be lower over time when compared to non-offenders.

H2: Ex-offenders have lower earnings trajectories across the career than non-offenders.

I suspect that the stigma associated with incarceration accumulates as ex-offenders age. While the years between the time they were incarcerated and their time in the labor force have increased, their criminal history probably influenced the type of wages they received over time. For example, if ex-offenders work numerous low paying jobs, then their wage trajectory will be flatter over time. Therefore, I predict that the age-earnings profile is flatter relative to non-offenders.

H3: The costs of imprisonment are higher for minority ex-offenders than for white ex-offenders.

I suspect that the consequences of incarceration operate somewhat differently for African Americans, Latinos, and whites. Given ex-offender labor market experiences may be shaped by their criminal history, I suspect that differences in human and social capital accumulation perpetuate racial and ethnic inequality and subsequently affect labor market outcomes for minority ex-offenders. Specifically, if employers engage in statistical discrimination, they may not hire individuals who are African Americans or Latinos based upon the group stereotypes associated with minority status. I suspect that when the status of being an ex-offender is added to being an African American or Latino male, employers will be even less likely to hire these individuals than they will be to hire an ex-offender who is white. The stereotypes employers associate with ex-offenders and minorities as a group affects the labor market opportunities of individuals who belong to these groups. Therefore, I predict that African American and Latinos ex-offenders will have lower earnings than white ex-offenders.

H4: Ex-offenders will have longer spells of unemployment than non-offenders.

I think two mechanisms influence the likelihood of ex-offenders being unemployed for long periods of time. By reducing endogenous human capital accumulation; incarceration decreases an ex-offender's opportunity to gain marketable job skills. As a product of being incarcerated, ex-offenders may have weak social networks that do not have information concerning employment opportunities. This lack of social capital can be particularly problematic for ex-offenders since most people rely heavily on friends and family members within their social networks to provide them with job referrals. As a consequence of weak social networks and skill deficits, I predict that ex-offenders will experience longer periods of unemployment.

H5: The costs of imprisonment lead to minority ex-offenders having longer spells of unemployment than white ex-offenders.

As a result of incarceration being a commonplace experience for minority men, I suspect that these men will have less useful social networks for generating information concerning legitimate employment opportunities. This is because their social networks will contain proportionally more ex-offenders in them than the social networks of white ex-offenders. These deficits translate into less labor force participation among minority ex-offenders. Based upon theories of racial/ethnic inequality (i.e., statistical discrimination), I suspect that the stereotypes associated with race/ethnicity and incarceration status may influence how employers make hiring decisions concerning racial/ethnic job applicants. Therefore, I predict that both social network composition along with racial/ethnicity stereotypes will increase the influence of incarceration on the employment opportunities of African American and Latino ex-offenders. Consequently, minority ex-offenders will remain unemployed longer than their white counterparts.

H6: Ex-offenders will have fewer weeks of cumulative work experience than non-offenders.

The stigma of incarceration decreases employment opportunities for ex-offenders. This lack of labor force participation results in ex-offenders having spotty work histories. These incomplete work histories can signal for employers that job applicants have a criminal record. As a result, employers are less likely to hire ex-offenders. Therefore, I predict that ex-offenders are more likely to have fewer weeks of cumulative work experience. I suspect that less cumulative work experience translates into a cumulative disadvantage concerning the accumulation of human capital for ex-offenders.

H7: The cost of imprisonment lead to minority ex-offenders having fewer weeks of work experience than white ex-offenders.

The pre-prison employment experiences of ex-offenders are low relative to non-offenders. Since the largest proportion of prisoners released into urban areas are minorities, the joint effect of race/ethnicity and a prison sentence makes obtaining post-prison employment difficult. I anticipate that employers perceptions of ex-offenders seeking employment will be influenced by ex-offenders' work history and racial/ethnic stereotypes. I suspect that employers will view a spotty work history and race/ethnicity as signals that indicate minority ex-offenders are not good workers. Therefore, I predict that minority ex-offenders will have fewer weeks of work experience than white ex-offenders.

3.8 Models

A useful method used to analyze longitudinal data with continuous outcome variables is the fixed effects model. The major advantage to specifying a fixed effects model is that this approach automatically controls for all constant, unobserved differences between individuals, regardless of whether or not those differences are associated with the likelihood of event occurrence (Allison 1994). Individuals who experience incarceration are often likely to be different on both measured and unmeasured variables from those that do not. It is possible with this model to obtain unbiased estimates of event effects as long as the differences are stable. Fixed effects models treat alpha (α) as constant unobserved differences that are correlated with the predictor variables. They automatically control for unobserved heterogeneity. Therefore, I am able to derive estimates free from selection bias.

The most obvious factor for this project is that people who go to prison tend to have poor educational backgrounds. Educational attainment and quality is an important source of wage variation independent of prison. There may also be other stable dispositions such as control orientation (Gottfredson and Hirschi 1990) or access to good legal representation (Dejong and Jackson 1998) that might influence both getting into prison and getting a job. Fixed effects estimators are not contaminated with the missing variable effects of unmeasured individual characteristics such as attitude, cohort, or socioeconomic background. These estimators also control for other unchanging aspects such as intelligence (cognitive skill), preferences developed during early socialization, and unmeasured human capital (England et al 1988). In this model, I also control for the education by age, race by age, and cognitive skill by age effects on wage trajectories. These factors may have emergent, in addition to stable, influence on career dynamics (Farkas et al 1997).

The fixed effects model takes advantage of the longitudinal nature of the data to focus on wage changes over the career while accounting for stable individual differences in covariates (England et al 1988). In this study, I estimate fixed effects models by treating each time point for each individual as a distinct observation and specify a model that includes a dummy variable for each individual (less one). The observations are then pooled and the model estimated by OLS regression. Only time-varying explanatory variables can be included in fixed-effects models (Allison 1994). Thus, using the fixed effects model allows me to focus on how changes in covariates affect wage growth from 1979-1998.

One disadvantage of fixed effects models is that they cannot include time invariant measures such as race/ethnicity or gender because they are perfectly correlated with the fixed effect. These time invariant measures are treated as fixed constants and conditioned from the data. With the individual-specific dummy variable approach, time-invariant variables, such as race/ethnicity or cognitive skill, cannot be included in the model because they are perfectly collinear with α (see Allison 1994)⁴. In this project race/ethnicity are modeled, however in interaction with age to estimate time-varying career trajectories. The loss of race specific intercepts is not a serious problem, however given the nature of the data. There are almost no unemployment, experience or wage inequalities early in the career, so I expect similar age–experience intercepts for white, Latino and African American men.

Another disadvantage of a fixed effects approach is that many parameters have to be adjusted for (at least implicitly); therefore it may be considerably less efficient than some other methods. In general, the estimated standard errors for the fixed effects models tend to be only slightly larger than those of alternative estimators. However,

⁴ In a fixed effects model α is treated as constant unobserved differences that are correlated with the predictor variables.

Allison (1994) suggests that a small loss of precision seems tolerable when it comes with potentially large reduction in unmeasured variable bias. This problem is smaller in large sample exercises such as this one. A more serious concern of using fixed effects models is the problem of autocorrelation (particularly when dealing with repeat observations). Autocorrelation can effect the estimation of fixed effects models by biasing standard errors and test statistics. Allison (1994) argues that since the major components of those correlations are based upon stable differences across individuals, the fixed effects estimator will correct for much of the cross-time correlations.

To address potential multicollinearity within fixed effects models, the time-varying covariates are centered as a solution (Jaccard 1990). Centering all measured variables also has the advantage of defining the intercept as the grand mean of Y across all observations. Since the fixed effect model has no intercept, centering is useful because the grand mean can be used in post-estimation graphing of predicted career trajectories derived from the models.

In this study, removing fixed effects is particularly important for the test of whether there is a net negative effect of incarceration on earnings, because all stable earnings-relevant but unobserved individual differences between individuals have been controlled. Most importantly, those factors that may influence imprisonment and labor market outcomes are well accounted for in these models because I control for education, cognitive skill and race as well as all unmeasured stable individual characteristics. Therefore, the inferences drawn from this analysis of longitudinal data are more powerful and provide information concerning how the consequence of incarceration affects individuals' careers over time.

3.9 Summary

In this chapter, I described the data, variables, models and modeling strategy used to investigate the impact of incarceration on labor market outcomes- (cumulative unemployment, cumulative work experience and earnings) for individuals. I presented a table that provided information concerning the number of men who actually were surveyed in a correctional facility during the administration of the NLSY. In addition, a second table displays descriptive statistics for the sample and for racial/ethnic subgroups. The descriptive statistics indicate that racial/ethnic disparities exist among young men. Next, I presented hypotheses that I plan to test and the discussed the fixed effects modeling strategy. Based upon the information presented in this chapter, I made predictions concerning the degree to which changes in human capital acquisition associated with imprisonment affect the earnings trajectory of ex-offenders throughout the career.

CHAPTER 4

THE IMPACT OF INCARCERATION ON CUMULATIVE UNEMPLOYMENT

4.1. Introduction

The first stage of examining the impact of incarceration on human capital accumulation across the career is examined in this chapter with estimation of the proposed unemployment models. The dependent variable is cumulative unemployment and the observations are 69,133 person years for the male sub-sample of the NLSY. Since unemployment is defined to reflect active job searching these models isolate the influence of prison experiences on the difficulty of job search. In the theoretical model prison is hypothesized to make job search more difficult because it weakens social capital ties to employment and increases stigma associated with job applicants. Specifically, I investigate two questions: (1) whether net of other factors, there are differences in the number of weeks ex-offenders and non-offenders experience being unemployed throughout the career and (2) whether there is racial/ethnic variation in the number of weeks white, Latino and African American ex-offenders are unemployed across the career. The latter set of estimates allows me to explore the proposition that the stigma or social capital effects of imprisonment are more deleterious for minorities. To do this, the offender status of these men is regressed on cumulative unemployment, controlling for the number of hours worked, marital status, central city residence, suburban residence, cognitive skill, school enrollment and educational attainment. Because there are increasing returns to education and cognitive skill across the career (Farkas et. al 1997), these terms are modeled in interaction with age. These controls, in addition to the fixed effect modeling of unmeasured but stable person and year influences, lead to relatively strong confidence that these models actually estimate the consequences of imprisonment, rather than some other unmeasured variables correlated with going to prison. To examine the issue of racial/ethnic variation in the cumulative

unemployment of ex-offenders, I introduce age-race/ethnicity interaction terms in the models.

4.2 Observed Cumulative Unemployment Patterns

Figure 4.1 charts observed cumulative unemployment disparity for ex-offenders and non-offenders¹. At age 18, the observed mean cumulative unemployment for an average ex-offender is 6.50 weeks. An average non-offender has an observed mean cumulative unemployment of 9.59 weeks. At age 19, the expected pattern emerges, ex-offenders experience more weeks of cumulative unemployment. This gap in cumulative unemployment grows across the career. By age 37, an average ex-offender experiences 100 weeks of cumulative unemployment². However, an average non-offender has a mean cumulative unemployment of 44.76 weeks across the career. At age 37, the observed average weeks of cumulative unemployment for non-offenders is 45% of the average weeks of cumulative unemployment for ex-offenders. Clearly, those who go to prison have much more difficulty finding work than those who do not. Since Figure 4.1 does not control for covariates that are associated with entering prison, I cannot determine from these data if being incarcerated or other factors, such as personality, educational failure, or racial discrimination in labor markets produces this dramatic inequality among ex-offenders and non-offenders.

¹ In Figure 4.1, the distribution of cumulative unemployment by age appears non-linear. Based upon the graph of the observed mean values, I ran a series of fixed-effects models where the dependent variable cumulative unemployment was logged. The amount of variance explained by these models is less than the variance explained by the models where cumulative unemployment is modeled in its metric (weeks). Therefore, I decided not to log the dependent variable cumulative unemployment.

² There are relatively small year to year sample sizes after age 38. When discussing trends and patterns late in the career, I will only discuss labor market outcomes for 37 year olds.

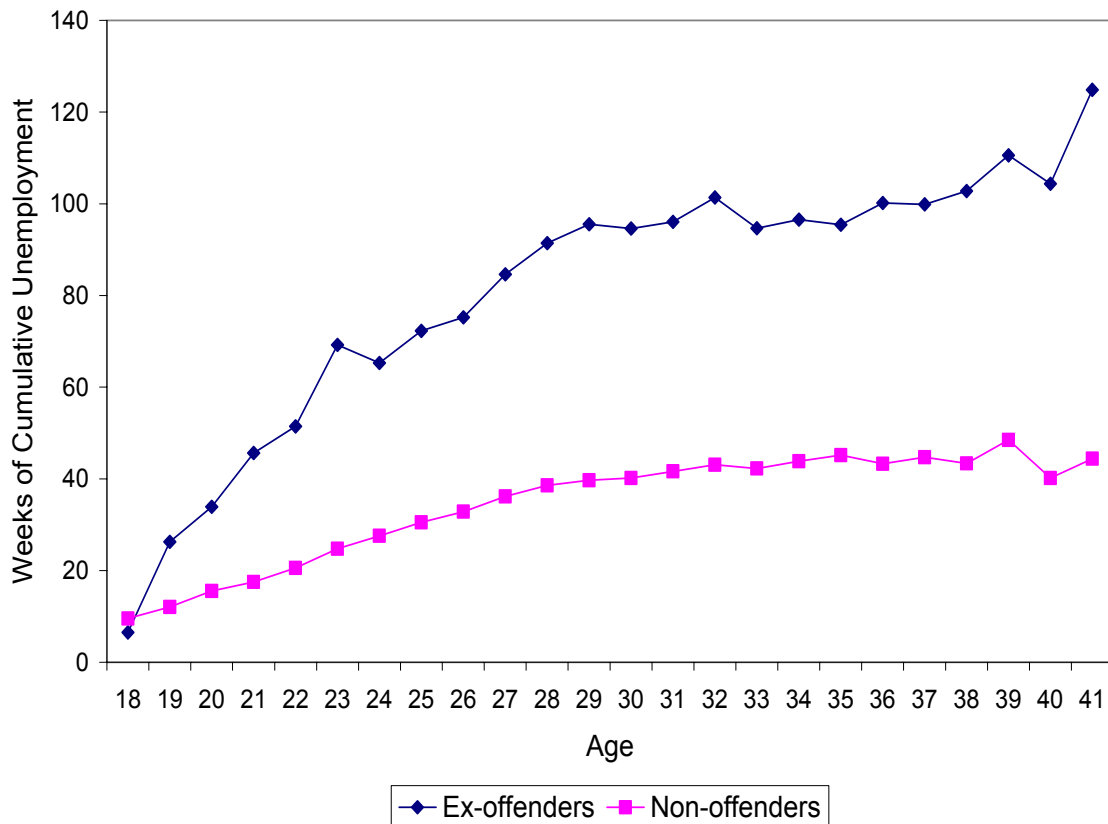


Figure 4.1. Observed Cumulative Unemployment by Offender Status, NLSY Men, 1979-1998

Figure 4.2 charts observed cumulative unemployment for ex-offenders and non-offenders by race/ethnicity. In general, ex-offenders experience more weeks of cumulative unemployment than non-offenders across the career. Among ex-offenders, there is also racial/ethnic variation in the number of weeks of cumulative unemployment.

At age 18, the observed mean weeks of cumulative unemployment for an average African American ex-offender is 23.27 weeks. The average Latino ex-offender experienced 17.30 weeks, and an average white ex-offender experienced 13.90 weeks of cumulative unemployment. Among non-offenders at age 18, the observed mean weeks of cumulative unemployment for an average African American male is 12.63 weeks. An average Latino male has 10.75 weeks of cumulative unemployment. An average white non-offender has

9.08 weeks of cumulative unemployment. When comparing differences between ex-offenders and non-offenders by race/ethnicity, there is little difference in the observed mean weeks of cumulative unemployment for white ex-offenders and African American non-offenders between the ages of 18-22. This pattern is not surprising because African American non-offenders, particularly the young men in this age range, tend to have high levels of unemployment (Tienda and Steir 1996). What is surprising about the similarity between the white ex-offender and the African American non-offender age-cumulative unemployment profile is that incarceration along with other factors may contribute to a labor market outcome penalty for white ex-offenders. However, the race/ethnic disparity in weeks of cumulative unemployment between ex-offenders and non-offenders grows dramatically across the career, until about age 30 and then the trajectories begin to converge.

By age 37, African Americans who have never been to prison have about the same average level of cumulative unemployment as white ex-offenders. At age 37, the observed mean weeks of cumulative unemployment for an average African American ex-offender is 126.35 weeks. Latino ex-offenders have an observed mean of 108.00 weeks of cumulative unemployment and white ex-offenders have an observed mean of 68.75 weeks of cumulative unemployment. At age 37, the observed average weeks of cumulative unemployment for Latino ex-offenders is 85% of the average weeks of cumulative unemployment for African American ex-offenders. Likewise, the observed average weeks of cumulative unemployment for white ex-offenders is 54% of the average weeks of cumulative unemployment for African American ex-offenders.

Among 37-year-old non-offenders, the observed mean weeks of cumulative unemployment for an African American is 72.26 weeks, compared to 47.74 weeks for Latino men and 40.88 weeks for white men. Along the career trajectory, the observed average weeks of cumulative unemployment for Latino non-offenders is 66% of the average weeks of cumulative unemployment for African American ex-offenders. However for white non-

offenders, the observed average weeks of cumulative unemployment is 57% of the average weeks of cumulative unemployment for African American non-offenders.

There are two patterns apparent within Figure 4.2. First, ex-offenders have more weeks of cumulative unemployment than non-offenders. Second, African Americans have more difficulty finding work than Latinos and whites. The race effect is very large and by their mid-30s African American non-offenders and white ex-offenders average cumulative unemployment begins to overlap. The reader should note that the relatively sharp year-to-year fluctuations of cumulative unemployment spells for Latino offenders across the time period and for African American and white offenders after age 38 reflect relatively small year-to-year sample sizes.

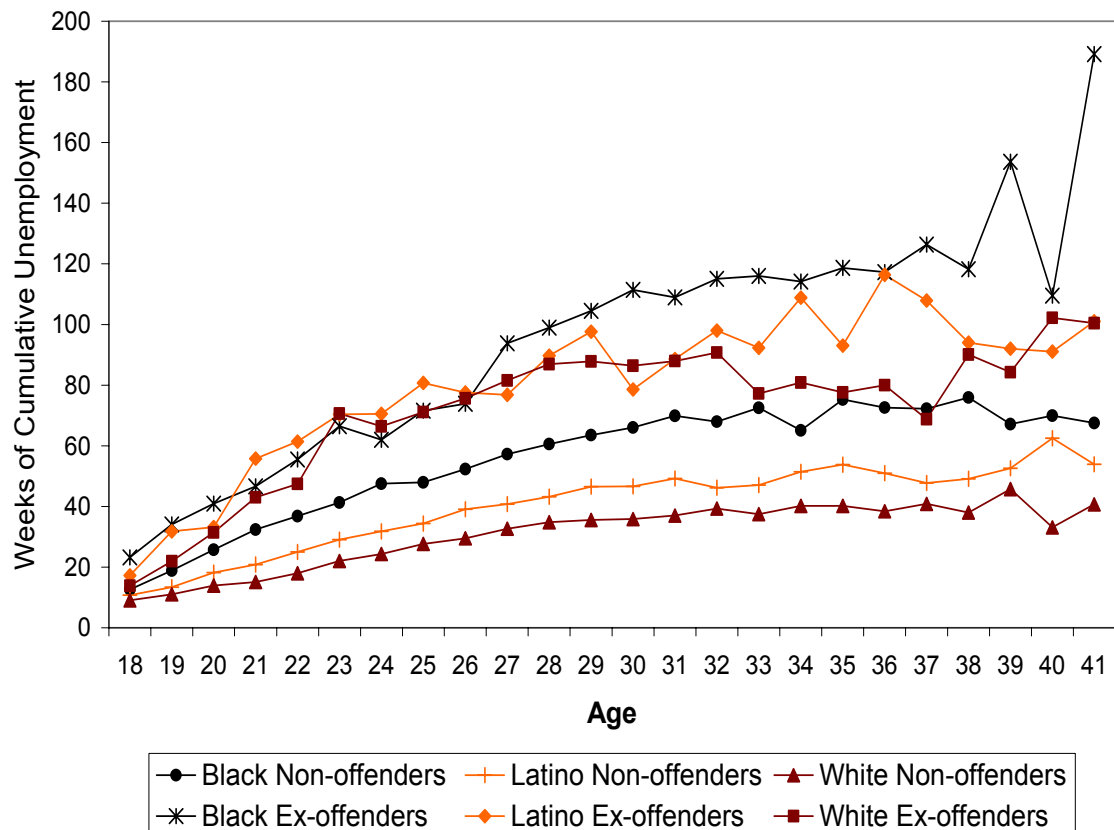


Figure 4.2. Observed Cumulative Unemployment by Offender Status and Race/Ethnicity, NLSY Men 1979-1998

4.3 Fixed Effects Model Estimates

The literature concerning the impact of incarceration on earnings suggests that the inability to accumulate human capital contributes to earnings disparities between ex-offenders and non-offenders. By examining how incarceration impacts cumulative unemployment for ex-offenders with statistical controls for both fixed effects and age related exogenous effects such as education and marriage, I can see how prison influences the career trajectory of ex-offenders. The general fixed effects model is presented below:

$$\begin{aligned} \text{Unemployment}_{it} = & \alpha_t + \beta_1 \text{Age}_{it} + \beta_2 \text{Jail}_{it} + \beta_3 \text{PriorJail}_{it} + \beta_4 \text{Education}_{it} + \\ & \beta_5 \text{Age Education}_{it} + \beta_6 \text{Age(In) PriorJail}_{it} + \beta_7 \text{Age(In) Black}_{it} + \beta_8 \text{Age(In) Latino}_{it} + \beta_9 \\ & \text{Black Prior Jail}_{it} + \beta_{10} \text{Latino Prior Jail}_{it} + \beta_{11} \text{Age(In) Black Prior Jail}_{it} + \beta_{12} \text{Age(In) Latino Prior Jail}_{it} + \beta_{13} \text{Control}_{it} + Z_i + \varepsilon_{it} \end{aligned}$$

where

Unemployment_{it}	=	Cumulative unemployment in time t
Z_i	=	Characteristics that are measured and stable over time (e.g., Race/Ethnicity, Cognitive Skill)
α_t	=	Fixed effect for unobserved and observed differences across individuals that are stable over time
Age_{it}	=	Respondent's age in time t
Jail_{it}	=	Current Incarceration in time t
Prior Jail_{it}	=	Prior Incarceration in time t
Education_{it}	=	Years of education in time t
$\text{Age Education}_{it}$	=	Product term for age and education in time t
$\text{Age PriorJail}_{it}$	=	Product term for age and prior incarceration in time t
Age Black_{it}	=	Product term for age and Blacks in time t
Age Latino_{it}	=	Product term for age and Latinos in time t
$\text{Black Prior Jail}_{it}$	=	Product term for Blacks and prior incarceration

Latino Prior Jail _{it}	=	Product term for Blacks and prior incarceration in time t
Age Black Prior Jail _{it}	=	Product term for age, Blacks and prior incarceration in time t
Age Latino Prior Jail _{it}	=	Product term for age, Latinos and prior incarceration and in time t
Control _{it}	=	Control variables in time t
ϵ_{it}	=	The disturbance term in time t

Table 4.1 reports the results of Models 1 through 5 concerning the impact of incarceration on unemployment³. In Model 1, there is a significant relationship between cumulative unemployment and current incarceration. For men who are currently incarcerated, cumulative unemployment decreases by 2 weeks, controlling for hours worked per week, marital status, school enrollment, city residence, and suburban residence. Although the finding may appear to be counterintuitive, the decrease in weeks of cumulative unemployment for men currently incarcerated is probably a function of how the term unemployment is defined in labor market research. Based upon the official BLS definition, those who are incarcerated are not considered unemployed. Therefore, across the career trajectory, the number of weeks an individual is incarcerated is not factored into the value of cumulative unemployment. This model indicates that there is a significant relationship between cumulative unemployment and age⁴. For every additional year, cumulative unemployment increases by 2.38 weeks. In this model, two interaction terms are present,

³ In order to determine what would be the best way to measure incarceration, I also experimented with a variable I created that counts the number of correctional interviews. The count of prior correctional interviews might identify chronic offenders who have several years or multiple spells in prison or jail. The results for this measure are slightly uneven because there are only a few respondents that have multiple correctional interviews. Therefore the estimates of the dichotomous variable prior incarceration are reported in Table 4.1.

⁴ In this study age is not conceptualized in chronological terms, it merely represents the linear trend of time across the career trajectory.

age by education and age by cognitive skill. The interaction between age by education is significant. Thus, the relationship between cumulative unemployment and education is conditioned by age. Those individuals with high levels of educational attainment experience a decrease in cumulative unemployment across the career, relative to individuals with low educational attainment. In addition, the age by cognitive skill interaction is significant. This suggests that for individuals whose cognitive skill increases across the career, their cumulative unemployment decreases, relative to individuals with low levels of cognitive skill.

The most important finding from Model 1 shows that there is a significant relationship between cumulative unemployment and prior incarceration. Men who have ever been to prison or jail experience 23.45 weeks more cumulative unemployment across the career than non-offenders, net of hours worked, marital status, school enrollment, city residence, suburban residence and the fixed-effect. Thus, Model 1 supports *Hypothesis 4: Ex-offenders will have longer spells of unemployment.*

Models 2 and 3 introduce interaction terms for age by prior incarceration and age by race/ethnicity respectively. In Model 2, the interaction term is significant indicating that the effect of prior incarceration is conditioned by age. Specifically, ex-offenders experience an increase of 1.33 weeks of cumulative unemployment relative to non-offenders over time. Model 3 finds that there are significant differences in cumulative unemployment by race/ethnicity. African American men will be subjected to a 1.00 week increase in cumulative unemployment per year relative to whites. After controlling for other factors, Latino men's cumulative unemployment decreases by 0.11 weeks per year relative to whites.

Models 4 and 5 introduce a two-way interaction between race/ethnicity by prior incarceration and a three-way interaction age by race/ethnicity by prior incarceration respectively. The interactions are introduced in order to test hypotheses which suggest that the relationship between cumulative unemployment and prior incarceration is conditioned by

race/ethnicity. These interactions are statistically significant. The first set of interactions in Model 4 suggests that the relationship between cumulative unemployment and prior incarceration varies by race/ethnicity. Specifically, African American ex-offenders cumulative unemployment increases by 10 weeks relative to whites. Latino ex-offenders cumulative unemployment increases 5 weeks relative to whites across the career. In Model 5, the relationship between cumulative unemployment and prior incarceration varies by age and race/ethnicity. Specifically, African American ex-offenders cumulative unemployment increases by 0.54 weeks relative to white ex-offenders. Latino ex-offenders cumulative unemployment increases by 0.47 weeks relative to white ex-offenders. The results indicate that there are significant race/ethnic differences in cumulative unemployment for ex-offenders. Therefore, the results from Models 4 and 5 support Hypothesis 5: *Minority ex-offenders will have longer spells of unemployment than white ex-offenders.* The racial/ethnic variation in the cumulative unemployment trajectories for ex-offenders suggests that employers may simultaneously process incarceration status and race/ethnicity as signals that influence the probability of employment. In addition, the race/ethnic variation in cumulative unemployment also varies for non-offenders. Specifically, African American non-offenders cumulative unemployment increases 1.00 week per year relative to white non-offenders. Likewise, Latino non-offenders cumulative unemployment decreases by -0.12 weeks of across the career relative to white non-offenders.

In terms of causal inference, the results of the fixed effects models above should be interpreted with caution. Criminologists have argued that a reciprocal relationship between unemployment and crime is far more accurate (Thornberry and Christenson 1984). To address this issue of casual inference, I ran an OLS model that included a lag variable for unemployment in the previous year. The lag variable can be expressed in the following form ($\text{Cumulative Unemployment}_{\sum 79-98} - \text{Unemployment}_{it}$). This OLS model contains the same predictor variables featured in Model 1 of Table 4.1. The results of this model suggest that

prison experience increases cumulative unemployment. The prison coefficient of cumulative unemployment is 23.45 weeks. This is the effect of prison on cumulative unemployment at the mean age of the sample (age 27). The coefficient of the lag variable is 1.40 weeks. The lag variable is the effect of cumulative unemployment in the previous year. Since the mean years in the sample is 9, the lag model suggests that the cumulative effect of prison is 12.6 additional weeks of unemployment, this value is smaller than the comparable estimate of 23.45 weeks in Model 1 of Table 4.1, but quite similar to the estimates in later models.

Since the lag variable is estimated using OLS, caution must be warranted due to the underlying assumption associated with including a lag variable in the analysis. The incorporation of a lag variable suggests that an individual's unemployment is a function of personal history. For instance, in the OLS model unmeasured factors such as the unemployment rate of the local labor market may affect an individual's ability to gain employment. However, a fixed effects model assumes that unemployment is based upon a fixed personality characteristic. Since the fixed effects model controls for unobserved heterogeneity of individuals across time, it also controls for a myriad of factors that would shape the unemployment trajectories of individuals, such as the variation in local labor markets. Therefore, I had to assess the tradeoff associated with modeling the relationship between prison and cumulative unemployment using OLS or fixed effects. I feel that the tradeoff of not using the lag variable is minimal because I think the cumulative unemployment measure used in the fixed effects models better captures the underlying predisposition of being unemployed.

Table 4.1. Fixed Effect Models of Cumulative Unemployment on Selected Variables for NLSY Men, 1979-1998 (Person Years = 69,133).

	Model 1	Model 2	Model 3	Model 4	Model 5
Current Incarceration	-1.91 ⁺ (1.87)	0.28 (0.27)	0.22 (0.22)	0.07 (0.08)	0.03 (0.03)
Prior Incarceration	23.45*** (27.05)	19.72** (21.67)	18.25*** (20.10)	13.43*** (9.86)	13.64*** (19.69)
Education	0.03 (0.21)	0.02 (0.14)	-0.06 (0.46)	-0.06 (0.46)	-0.06 (0.47)
Age	2.38*** (112.39)	2.39** (112.97)	2.30*** (103.12)	2.31*** (103.23)	2.30*** (102.34)
Age*Cognitive Skill	-0.84*** (35.79)	-0.82*** (34.63)	-0.58*** (21.89)	-0.58*** (22.01)	-0.57*** (22.03)
Age*Education	-0.22*** (24.60)	-0.22*** (24.36)	-0.27*** (29.44)	-0.27*** (29.53)	-0.27*** (29.58)
Age*Prior Incarceration		1.33*** (13.28)	1.14*** (11.39)	1.08*** (10.80)	0.82*** (5.48)
Age*Black			1.00*** (22.46)	1.00*** (21.24)	1.00*** (21.24)
Age*Latino			-0.11 ⁺⁺ (2.47)	-0.12 ⁺⁺ (2.56)	-0.11 ⁺⁺ (2.45)
Black*Prior Incarceration				10.00*** (5.18)	9.17*** (4.66)
Latino*Prior Incarceration				5.14** (2.17)	4.55* (1.87)
Age*Black*Prior Incarceration					0.54** (2.36)
Age*Latino*Prior Incarceration					0.47* (1.64)
R ²	0.857	0.858	0.859	0.859	0.859

Absolute value of t statistic in parentheses

*p<.05 **p<.01 ***p<.001 (one-tailed tests)

⁺p<.05 ⁺⁺p<.01 ⁺⁺⁺p<.001 (two-tailed tests)

Note: Time-invariant main-effects are excluded from fixed-effects models. These estimates are based upon variables centered around the grand mean. The coefficients are unstandardized estimates. Table 4.1 presents results for variables of substantive interest only. The control variable results are presented in the Appendix, Table A.1.

Table 4.2. OLS Model Unemployment Lag Variable

	OLS Results
Current Incarceration	-1.65*** (4.62)
Prior Incarceration	1.40*** (7.81)
Education	-0.176*** (12.64)
Age	-0.223*** (30.67)
Age*Cognitive	0.117*** (14.75)
Age*Education	0.020*** (6.54)
Unemployment Lag Variable	1.04*** (1514.84)
R ²	0.9766

Person Years = 69,133

Absolute value of t statistic in parentheses

*p<.05 **p<.01 ***p<.001 (one-tailed tests)

Table 4.2 presents results for variables of substantive interest only. The control variable results are presented in the Appendix, Table A.2.

4.4 Predicted Values for Unemployment Models

Figures 4.3 and 4.4, chart the predicted values for cumulative unemployment across the career. The predicted value calculations are based upon Models 3 and 5. In model 3, the estimates are used to generate predicted values for ex-offenders and non-offenders. Model 5 is used to generate predicted values that allow me to examine the race effect on the cumulative unemployment trajectory. All predicted values are calculated at the sample mean for all other variables except marital status and current school enrollment. These two variables are strongly related to age and cumulative

unemployment. Therefore, age specific means for current enrollment and marital status are used in the estimation of predicted weeks of cumulative unemployment.

Based on model 3, the predicted values of cumulative unemployment are graphed by offender status as presented in Figure 4.3. For, ex-offenders, the cost of imprisonment results in more cumulative unemployment across the career. At age 18, an ex-offender has 23.82 weeks of cumulative unemployment. A similar non-offender has 17.19 weeks of cumulative unemployment. This gap in cumulative unemployment increases across the career. By age 37, the ex-offender has a cumulative unemployment of 86.30 weeks. The similar non-offender has a cumulative unemployment of 58.02 weeks across the career. Overall, the time spent out the labor force that many ex-offenders experience translates into a spotty work history and subsequent spells of unemployment. The predicted gap at age thirty-seven is 28.28 weeks. The observed gap in Figure 4.1 is 55.15 weeks, thus prison increases job search time considerably, about 51% of the increased unemployment of prisoners by age 37 is estimated to be a function of prison time and 49% is a function of differences of the other factors in the model including educational achievement, marriage, race/ethnicity and fixed but unmeasured individual effects.

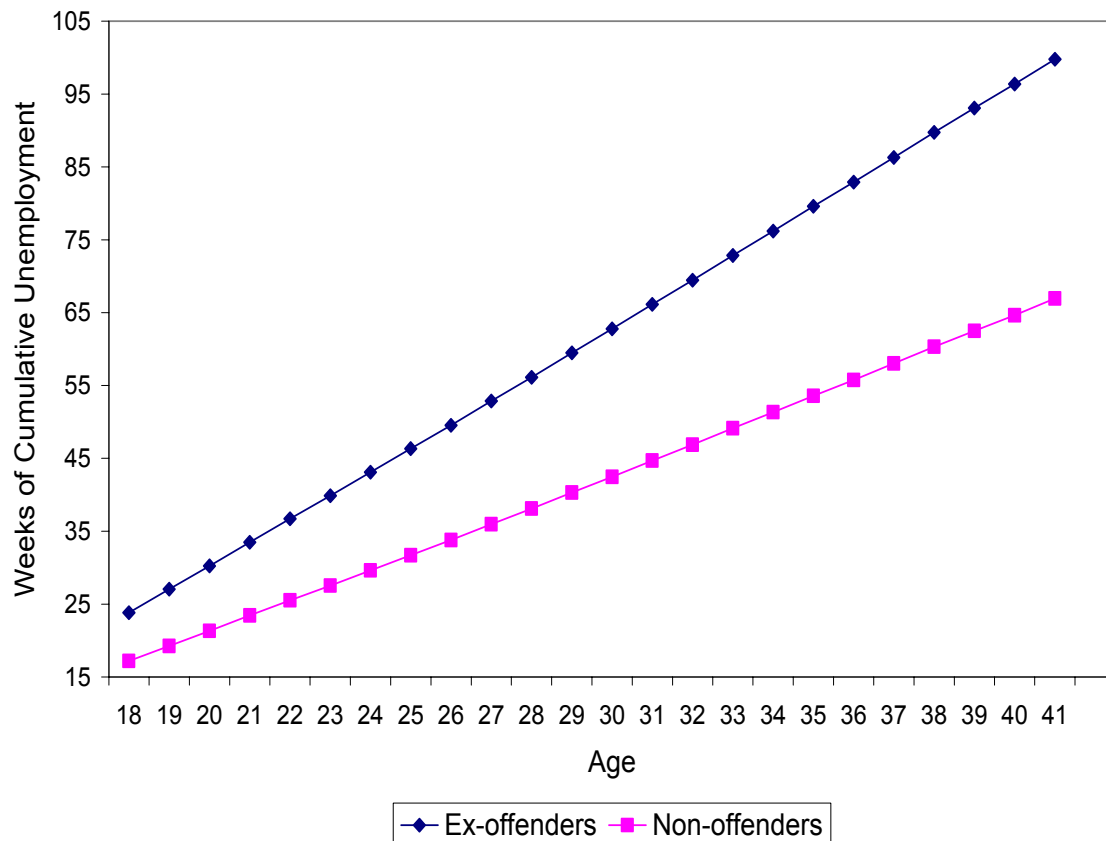


Figure 4.3. Predicted Values of Cumulative Unemployment by Offender Status, NLSY Men, 1979-1998

Based on Model 5, Figure 4.4 presents the predicted values of cumulative unemployment graphed by offender status and race/ethnicity. Early in the career, white ex-offenders have more weeks of cumulative unemployment than Latino and African American ex-offenders. At age 23, the cumulative unemployment values for African American, Latino and white ex-offenders are equal. From this point, a pattern emerges in which African American ex-offenders begin to accumulate more weeks of cumulative unemployment than Latinos and whites. By age 37, an African American ex-offender has 32.23 more weeks of cumulative unemployment than an African American non-offender. While a Latino ex-offender has 28.37 more weeks of cumulative

unemployment than a Latino non-offender. A white ex-offender has 18.37 more weeks of cumulative unemployment across the career than a white non-offender.

The chart in Figure 4.2 also indicates that cumulative unemployment varies by race/ethnicity for non-offenders. The same early career pattern we saw among ex-offenders is repeated among non-offenders. Young white non-offenders have more weeks of cumulative unemployment than African American and Latino non-offenders. Like the ex-offenders, this trend continues until age 29. For the remainder of the age trajectory, African American non-offenders begin to gain more cumulative unemployment across the career. At age 37, an African American non-offender with average characteristics on all other variables experiences, 65.46 weeks of cumulative unemployment. A similar Latino non-offender accumulates 63.30 weeks of cumulative unemployment, while a similar white non-offender has only 57.24 weeks of cumulative unemployment across the career.

Comparing across the offender status groups, there is clear evidence that the age-unemployment profiles are not the same among race/ethnic status groups. Early in the career, there is a large gap between white ex-offenders and African American non-offenders. Later in the career, the gap between the unemployment trajectories for white ex-offenders and African American non-offenders closes. By the end of the career trajectory, the difference between white ex-offender cumulative unemployment and African American non-offender cumulative unemployment is only 10 weeks.

From the predicted values depicted in Figure 4.3, I found that within all three race/ethnic statuses prison time increases cumulative unemployment net of other characteristics. It appears that early in the career African Americans who go to prison have better pre-prison career trajectories than whites who go to prison, but the prison experience inflicts more serious consequences on later career trajectories for African American ex-offenders. There is a similar but less dramatic pattern for Latinos.

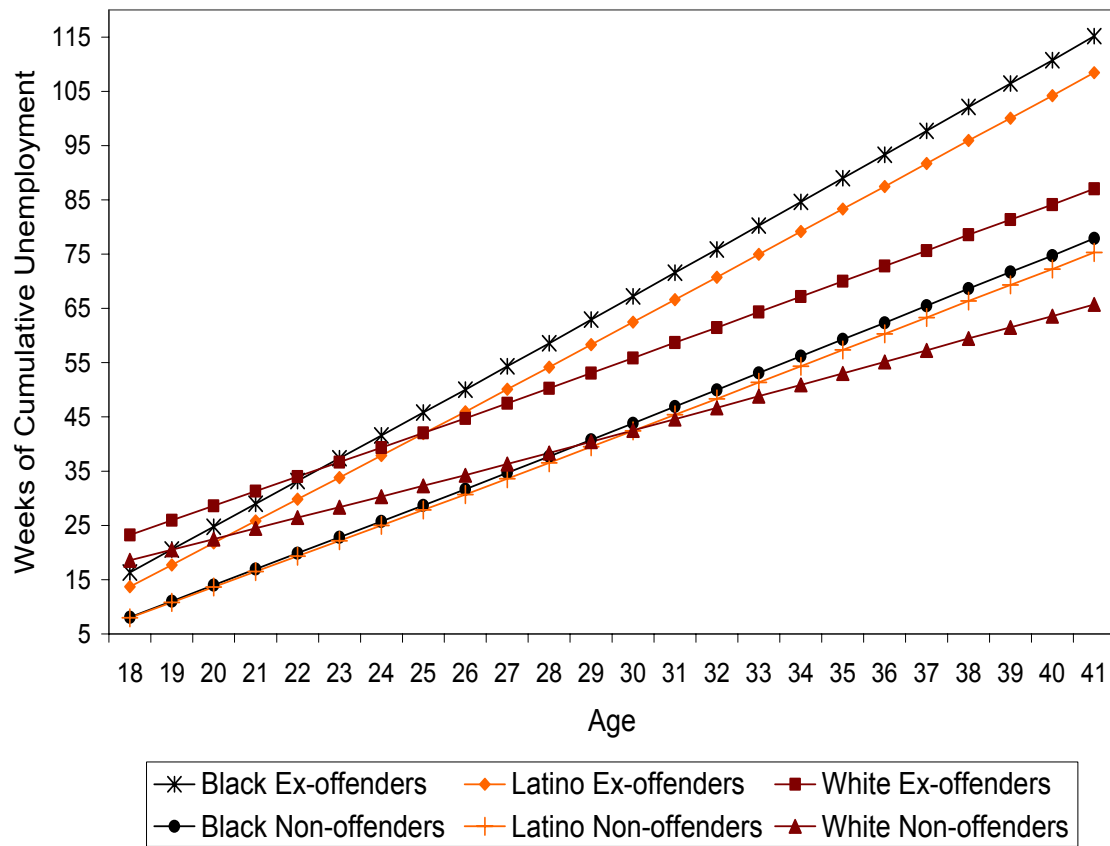


Figure 4.4. Predicted Values of Cumulative Unemployment by Offender Status and Race/Ethnicity, NLSY Men, 1979-1998

4.5 Discussion

In this chapter I examined the impact of incarceration on cumulative unemployment. The presentation of the observed charts for cumulative unemployment by offender status and offender status and race/ethnicity provide information concerning the distribution of the mean values for these respective subgroups of men. The fixed-effects models tested the hypotheses pertaining to the influence of incarceration on cumulative unemployment. The models supported the hypotheses that ex-offenders experience longer spells of cumulative unemployment than non-offenders and that the cost of imprisonment results in minority ex-offenders having more cumulative unemployment than white ex-offenders. These models show that after controlling for

exogenous human capital (i.e., cognitive skill and education), marriage, enrollment status, fixed effects of personal history and period, being incarcerated increases the likelihood of unemployment throughout the career.

The implications of these findings are two-fold. First, it appears from these models, that regardless of exogenous human capital acquisition, the stigma of incarceration can potentially undermine the value of any educational credentials and skills of ex-offenders. For example, an ex-offender may have met the educational requirement and even pass an aptitude test administered by an employer, but the applicant has several gaps in his work history. The job applicant's chances of being hired may be reduced, because the employer may perceive the spotty work history as an indication of a prison record. Since ex-offenders spend long periods of time out the labor force, they are not able to develop social capital that would bind them to conventional institutions. For example, ex-offenders may not be members of social networks that have information concerning employment opportunities. As a result, they are less likely to be employed in workplaces where the quality of social ties leads to accumulating marketable skills. Second, the age-unemployment profile, illustrates that the gap between ex-offenders and non-offenders grows across the career. These periods of unemployment increase, as ex-offenders grow older.

Among ex-offenders, young white ex-offenders have more weeks of cumulative unemployment than their Latino and African American counterparts early in the career, net of other factors. This suggests that white offenders labor market status is, net of other factors, worse off when they go to prison than minority offenders. Across the career, however, white offenders' have a less steep relationship between prison record and cumulative unemployment than minority offenders. This pattern suggests that white ex-offenders may experience a penalty for being incarcerated in the short-term (i.e., the period shortly after serving a prison sentence), however, after age 30, the African

American ex-offenders begin to experience more unemployment spells than Latinos and whites. This gap continues to grow along the age trajectory. This finding suggests that African Americans, and Latinos to a lesser degree, experience the penalty associated with incarceration in terms of cumulative disadvantage along the career trajectory.

Interestingly, when charting the predicted values of cumulative unemployment by offender status and race/ethnicity, there is a gap between the white ex-offender and the African American non-offender trajectories. Along the early trajectory, white ex-offenders have more weeks of cumulative unemployment than African American non-offenders. After age 30, the gap between the two groups begins to diminish. By the end of the career, there is very little difference in the age-unemployment profile of a white ex-offender and that of an African American non-offender. Perhaps, this finding indicates that employers may view the accumulation of gaps in the work history of African American non-offenders as possible evidence of criminal activity or incarceration. Therefore, employers may engage in statistical discrimination if they consider African American non-offender job applicants as “ex-offenders by default” within the context of the hiring decision making process (Holzer et al 2002). Overall, the results of this chapter demonstrate that the penalty associated with incarceration increases the time spent out the labor force, and subsequently leads to more cumulative unemployment throughout the career.

Using fixed-effects models to estimate incarceration effects on cumulative unemployment over time is advantageous because it is such an effective method for controlling for unmeasured but stable individual differences. Fixed-effects model estimators are powerful because they remove selectivity biases. With a fixed-effect model, I am able to control for all unobserved differences across individuals that are constant over time, regardless of whether the characteristics are associated with the outcome variable as well as time-varying control variables. In addition, fixed-effects

models allow me to control for other possible time invariant explanatory variables that may be related to cumulative unemployment because the main effects of these other explanatory variables are subsumed within the fixed-effects model (Allison 1994). Therefore, fixed-effects models reduce measurement error associated with: (1) the unmeasured fixed attributes of individuals and (2) the influence of omitted variables that may be correlated with the observed predictors. As a result, I have obtained a relatively unbiased estimation of incarceration effects on cumulative unemployment along the career trajectory. While these estimates are unbiased, they also partly capture the effect of unemployment on incarceration as demonstrated in Table 4.2. With these estimates, I can make relatively strong inferences about the influence of being incarcerated on labor market outcomes for the NLSY sample.

4.6 Summary

To address the impact of incarceration on labor market outcomes for individuals, I examined the relationship between incarceration and unemployment. Overall, the results provided evidence concerning the negative impact incarceration has on cumulative unemployment. Also, the findings suggest that the relationship between incarceration and cumulative unemployment is shaped by the race/ethnicity of the ex-offender. Since incarceration disrupts the career trajectory for individuals, this disruption potentially translates into longer periods of unemployment, which contributes to lower human capital accumulation across the career.

CHAPTER 5

THE IMPACT OF INCARCERATION ON CUMULATIVE WORK EXPERIENCE

5.1 Introduction

The second stage of examining the impact of incarceration on human capital accumulation across the career is examined in this chapter with estimation of the proposed work experience models. In this chapter, the dependent variable is cumulative work experience. Cumulative work experience is conceptualized as an important aspect of endogenous human capital¹. Cumulative experience is understood as a signal to employers of work skills and habits learned during previous jobs. In these models, I isolate the influence of time spent in prison on the difficulty of obtaining this work experience that is typically viewed in human capital models as attractive to potential employers. Specifically, I investigate two questions: (1) whether there are differences in the number of weeks of work experience ex-offenders and non-offenders accumulate throughout the career net of other factors and (2) whether there is racial/ethnic variation in the cumulative work experience of white, Latino and African American ex-offenders. The latter set of estimates allows me to explore the proposition that the stigma or social capital effects of imprisonment are more harmful for minorities. To do this, the cumulative work experience of these men is regressed on offender status, controlling for the number of hours worked, marital status, central city residence, suburban residence, cognitive skill, school enrollment and educational attainment. These controls, in addition to the fixed effect modeling of unmeasured but stable person and year influences, encourage relatively strong confidence that these models actually estimate the consequences of imprisonment, rather than some other unmeasured

¹ The variable cumulative work experience is operationalized as the sum of the number of weeks respondents reported working during the survey years. This variable is different from the endogenous human capital variable mean cumulative work experience, which is used in the models featured in Chapter 6, the earnings analysis. Mean work experience is defined as the cumulative weeks worked divided by the years in the labor force.

variables correlated with going to prison. To examine the issue of racial/ethnic variation in the cumulative work experience of ex-offenders, I introduce age-race/ethnicity interaction terms in the models.

5.2 Observed Cumulative Work Experience Patterns

Figure 5.1 charts observed cumulative work experience age trajectories for ex-offenders and non-offenders. In general, non-offenders accumulate more work experience across the career than ex-offenders. At age 18, the observed mean weeks of cumulative work experience for an average non-offender is 60.78 weeks compared to an average ex-offender with 44.64 weeks of mean cumulative work experience. This gap in cumulative work experience grows dramatically across the career. At age 37, the observed mean weeks of cumulative work experience for a non-offender is 719.79 weeks. An average 37 year old ex-offender with average characteristics on all other variables has a cumulative work experience of 502.76 weeks². Clearly, those who go to prison have more difficulty accumulating work experience than those who do not. Given that Figure 5.1 does not control for covariates associated with entering prison, it is difficult to determine whether prison per se or others factors such as personality, educational failure or racial/ethnic discrimination in labor markets perpetuates inequality surrounding the accumulation of work experience across the career.

² However, the ex-offender observed mean cumulative work experience trajectory decreases sharply from 555.78 weeks of work experience to 359.87 weeks of work experience between age 40 and 41. The decline in the observed mean of cumulative work experience for 41 year old ex-offenders is the result of a small sample size. By age 41, there are a total of 11 white, Latino and African American ex-offenders participating in the survey. For the remainder of this chapter, the late career comparison will examine 37 year olds.

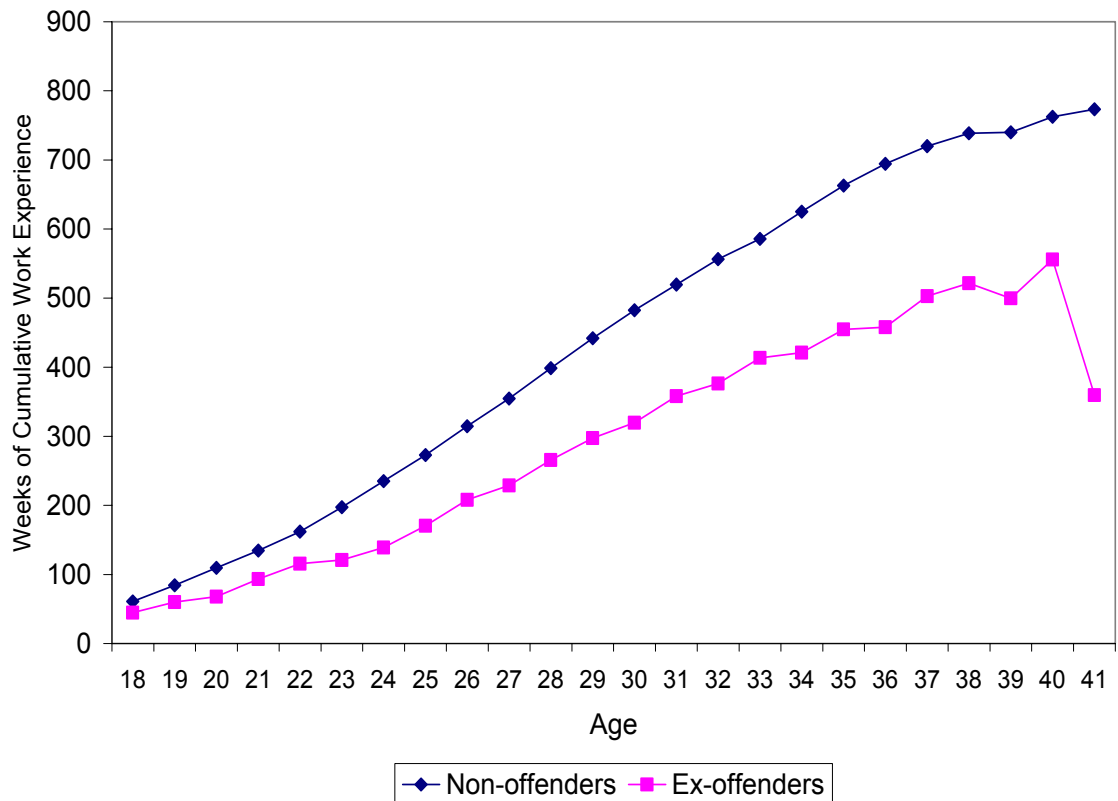


Figure 5.1. Observed Cumulative Work Experience by Offender Status, NLSY Men, 1979-1998

Figure 5.2 graphs observed cumulative work experience for ex-offenders and non-offenders by race/ethnicity. The general pattern found in Figure 5.1 is replicated in this chart. Within group comparison shows that there is also racial/ethnic variation in the number of weeks of cumulative work experience among non-offenders and ex-offenders. At age 18, the observed mean weeks of cumulative work experience for white non-offenders is 62.95 weeks. The average for Latino non-offenders is 55.50 weeks. On average, African American non-offenders would experience 38.35 weeks of cumulative experience. Among ex-offenders at age 18, the observed average mean weeks of cumulative work experience for a white male is 49.97 weeks, thirteen weeks less than whites who have not gone to prison. Latino males who have been to prison average 28.01 weeks, twenty seven weeks less than Latinos who have not been to prison. African American males who have already

been to prison by age 18 average 38.35 weeks, nine weeks less than African Americans who have not been incarcerated.

When examining comparisons between non-offenders and ex-offenders by race/ethnicity, there is little difference in the observed mean weeks of cumulative work experience for African American non-offenders and white ex-offenders between the ages of 18-22. The race/ethnic disparity in weeks of cumulative work experience between non-offenders and ex-offenders, however, grows dramatically across the career.

By age 37, the observed mean cumulative work experience for an average white ex-offender is 151.68 weeks than the average cumulative work experience of white non-offenders. The observed mean weeks of cumulative work experience for an average African American ex-offender is 206.81 weeks more than the average cumulative unemployment for an African American non-offender. An average Latino ex-offender has an observed mean cumulative work experience that is 128.37 weeks more than the observed mean cumulative work experience for an average Latino non-offender.

Figure 5.2 demonstrates that African American ex-offenders have more problems gaining work experience than Latinos and whites. The reader should note that the relative sharp year-to-year fluctuations in cumulative work experience for Latino ex-offenders across the time series and for white ex-offenders after age 38 reflect relatively small year to year sample sizes.

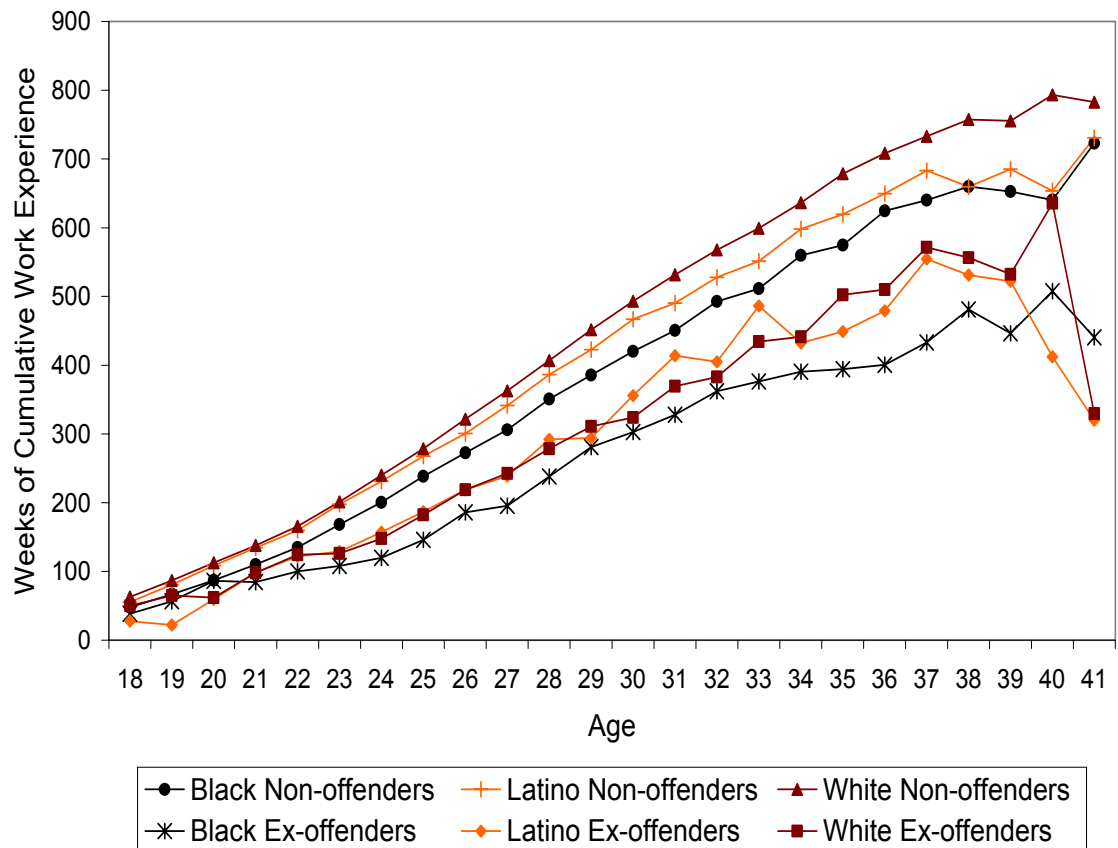


Figure 5.2. Observed Cumulative Work Experience by Offender Status and Race/Ethnicity, NLSY Men 1979-1998

5.3 Fixed Effects Model Estimates

The accumulation of human capital is critical to understanding how cumulative work experience, with statistical controls for both fixed effects and age related exogenous effects such as education and marriage shape the career trajectories of ex-offenders. Modeling how incarceration affects cumulative work experience can provide information concerning the influence of going to prison across the career. The general fixed effects model is presented below:

$$\begin{aligned} \text{Work Experience}_{it} = & \alpha_t + \beta_1 \text{Age}_{it} + \beta_2 \text{Jail}_{it} + \beta_3 \text{PriorJail}_{it} + \beta_4 \text{Education}_{it} + \beta_5 \text{Age} \\ & \text{Education}_{it} + \beta_6 \text{Age Prior Jail}_{it} + \beta_7 \text{Age Black}_{it} + \beta_8 \text{Age } t\text{Latino}_{it} + \beta_9 \text{Black Prior Jail}_{it} + \\ & \beta_{10} \text{Latino Prior Jail}_{it} + \beta_{11} \text{Age Black Prior Jail}_{it} + \beta_{12} \text{Age Latino Prior Jail}_{it} + \beta_{13} \\ & \text{Unemployment}_{it} + \beta_{14} \text{Tenure}_{it} + \beta_{15} \text{Control}_{it} + Z_i + \varepsilon_{it} \end{aligned}$$

where

Work Experience _{it}	=	Cumulative work experience in time t
Z _i	=	Characteristics that are measured and stable over time (e.g., Race/Ethnicity, Cognitive Skill)
α _{tj}	=	Fixed effect for unobserved and observed differences across individuals that are stable over time
Age _{it}	=	Respondent's age in time t
Jail _{it}	=	Current Incarceration in time t
Prior Jail _{it}	=	Prior Incarceration in time t
Education _{it}	=	Years of education in time t
Age Education _{it}	=	Product term for age and education in time t
Age PriorJail _{it}	=	Product term for age and prior incarceration in time t
Age Black _{it}	=	Product term for age and Blacks in time t
Age Latino _{it}	=	Product term for age and Latinos in time t
Black Prior Jail _{it}	=	Product term for Blacks and prior incarceration
Latino Prior Jail _{it}	=	Product term for Blacks and prior incarceration in time t
Age Black Prior Jail _{it}	=	Product term for age, Blacks and prior incarceration in time t
Age Latino Prior Jail _{it}	=	Product term for age, Latinos and prior incarceration and in time t
Unemployment _{it}	=	Cumulative unemployment in time t
Tenure _{it}	=	Tenure in current job in time t

Control_{it} = Control variables in time t

ϵ_{it} = The disturbance term in time t

Table 5.1 reports the results of Models 1 through 6 concerning the impact of incarceration on work experience. Model 1 shows that there is a significant relationship between cumulative work experience and prior incarceration. For those men who have been incarcerated in the past, they have 104.79 fewer weeks of work experience than non-offenders, net of the numbers of hours worked per worked, marital status, city residence, suburban residence, cognitive skill, school enrollment and educational attainment. Model 1 supports *Hypothesis 6: Ex-offenders will have fewer weeks of cumulative work experience than non-offenders.*

There is a significant relationship between cumulative work experience and age. Across the career, cumulative work experience increases on average by 40.21 weeks per year. The interaction terms for age by education and age by cognitive skill are included in Model 1. The interaction age by education is significant. It suggests that cumulative work experience increases by 0.26 weeks with each an additional year of education over time. Also, the relationship between cumulative work experience and cognitive skill is conditioned by age. High cognitive skill has increasing returns in experience across the career.

Models 2 and 3 introduce the interaction between age and prior incarceration and the product term between age and race/ethnicity. In Model 2, the interaction term age by prior incarceration is significant. Ex-offenders average 75 fewer weeks of cumulative work experience than non-offenders. The age by prior experience terms suggests that this average deficit accumulates across the career at about ten fewer weeks of employment per year for those who have been to prison relative to non-offenders. The results from Model 3 indicate that cumulative work experience varies by race/ethnicity. In general, white men accumulate more work experience than African American and Latino men. African

American men's cumulative work experience decreases by 2.11 weeks per year relative to white men. Latino men's cumulative work experience decreases by about half a week per year relative to whites.

In Models 4 and 5, interaction terms between race/ethnicity by prior incarceration and a three level interaction term between age by race/ethnicity by prior incarceration are added respectively. The results indicate that differences in cumulative work experience for ex-offenders do not vary for African American and white ex-offenders. Latino ex-offenders, net of other variables in the model accumulate about nine weeks less cumulative work experience per year relative to white ex-offenders. Model 5 adds a three level interaction for age by race/ethnicity by prior incarceration. Although the results of the interaction Black by prior incarceration is not statistically significant, the three level interaction age by black by prior incarceration is significant. The significance of this term suggests that across the career, African American ex-offenders cumulative work experience decreases by 2 weeks per year relative to white ex-offenders. Therefore, Models 4 and 5 support *Hypothesis 7: Minority ex-offenders will have fewer weeks of cumulative work experience than white ex-offenders.*

Model 6 adds a term for cumulative unemployment. Not surprisingly, the results indicate that there is a strongly significant relationship between cumulative work experience and cumulative unemployment. The coefficient is nearly one, which reflects the nearly definitional tradeoff between time spent unemployed or searching for work and experience in the labor market. Thus, one more week of unemployment translates into one less week of work experience. If an unemployed person becomes discouraged, then I would expect it to lead to less work experience because people leave the labor force. On the other hand, perhaps more unemployment means you must search for a job more aggressively and are less likely to leave a job when you finally have one.

After the cumulative unemployment measure is added to Model 5, the coefficient of prior incarceration decreases from -72.63 to -59.21. The age by prior incarceration interaction is reduced from -9.46 to -8.62. This indicates that incarceration influences experience not only through the stigma and the lack of social capital that impedes finding work, but incarceration also influences cumulative work experience in some additional manner, the most obvious being time spent in jail. It is also possible that this represents increased time not looking for employment because of pursuing criminal career activity.

Table 5.1. Fixed Effect Models of Cumulative Work Experience on Selected Variables for NLSY Men, 1979-1998 (Person Years= 69,133).

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Current Incarceration	20.19*** (8.21)	2.77 (1.14)	2.92 (1.21)	2.88 (1.19)	2.96 (1.25)	2.99 (1.36)
Prior Incarceration	-104.79*** (50.76)	-75.20*** (35.20)	-72.25*** (33.86)	-72.05*** (22.50)	-72.63*** (22.64)	-59.21*** (20.30)
Education	-9.85*** (32.30)	-9.78*** (32.58)	-9.61*** (32.12)	-9.61*** (32.13)	-9.61*** (32.10)	-9.67*** (35.56)
Age	40.21*** (796.31)	40.12*** (806.68)	40.38*** (767.92)	40.38*** (767.35)	40.40*** (763.66)	42.66*** (822.28)
Age*Cognitive Skill	1.80*** (32.19)	1.60*** (28.90)	1.05*** (17.11)	1.06*** (17.11)	1.06*** (17.14)	0.49*** (8.68)
Age*Education	0.26*** (12.44)	0.24*** (11.70)	0.34*** (15.89)	0.34*** (15.89)	0.34*** (15.79)	0.07*** (3.92)
Age*Prior Incarceration		-10.57*** (44.93)	-10.20*** (43.34)	-10.20*** (43.14)	-9.46*** (26.82)	-8.62*** (27.00)
Age*Black			-2.11*** (20.25)	-2.14*** (20.18)	-2.11*** (20.13)	-1.19*** (12.33)
Age*Latino			-0.46*** (4.31)	-0.43*** (3.91)	-0.43*** (4.02)	-0.55*** (5.55)
Black*Prior Incarceration				2.58 (0.57)	5.68 (1.23)	14.71*** (3.50)
Latino*Prior Incarceration				-9.16* (1.64)	-9.13 (1.59)	-4.64 (0.89)
Age*Black*Prior Incarceration					-1.79*** (3.36)	-1.27** (2.61)
Age*Latino*Prior Incarceration					-0.64 (0.95)	-0.17 (0.29)
Cumulative Unemployment						-0.98*** (115.71)
R ²	0.955	0.957	0.957	0.957	0.957	0.964

Absolute value of t statistic in parentheses

*p<.05 **p<.01 ***p<.001 (one-tailed tests)

Note: Time-invariant main-effects are excluded from fixed-effects models. These estimates are based upon variables centered around the grand mean. The coefficients are unstandardized estimates. The control variable results are presented in the Appendix, Table A.3.

5.4 Predicted Values for Work Experience Models

Figures 5.3 and 5.4, chart the predicted values for cumulative work experience across the career. The predicted value calculations are based upon Models 3 and 6. I generated predicted values based upon Model 3 because this model allows me to examine the incarceration effect on cumulative work experience. Using Model 6 to calculate predicted values allows me to examine the race by incarceration effect on cumulative work experience. All predicted values are calculated at the sample mean for all other variables except marital status and current school enrollment. These two variables are strongly related to age and cumulative unemployment. Therefore, age specific means for current enrollment and marital status are used in the estimation of predicted weeks of cumulative work experience.

Based on Model 3, as presented in Figure 5.3, the predicted values of cumulative work experience are graphed by offender status. Across the career, ex-offenders have fewer weeks of cumulative work experience than non-offenders. At age 18 the predicted work experience of ex-offenders is slightly higher than non-offenders. Beginning at age 23, the non-offenders close this small gap and start to accumulate more cumulative work experience than ex-offenders. This pattern continues throughout the career. By age 37, the non-offender with average characteristics on all other variables has accumulated 697.61 weeks of work experience. On the other hand, the similar ex-offender has only accumulated 542.14 weeks of cumulative work experience. Ex-offenders have a deficit of 155.47 fewer weeks of cumulative work experience than non-offenders across the career. This is a very large effect. By their late thirties, the prison experience has lead to three fewer years of cumulative experience. Since these models control for current incarceration, these effects happen after release from prison. Due to the impact of incarceration, ex-offenders are more likely to have fewer opportunities to accumulate human capital. This skill deficit impacts employment opportunities and results in less cumulative work experience across the career.

The predicted gap in cumulative work experience at age 37 is 155.47 weeks. The observed gap in Figure 5.1 was 217.03 weeks. Thus serving time in prison contributes to the increase in the gap of cumulative work experience for non-offenders and ex-offenders. About 71% of the increase in the gap of cumulative work experience between non-offenders and ex-offenders by age 40 is a function of incarceration and 29% is a function of differences in educational achievement, marriage, race/ethnicity and fixed but unmeasured individual characteristics.

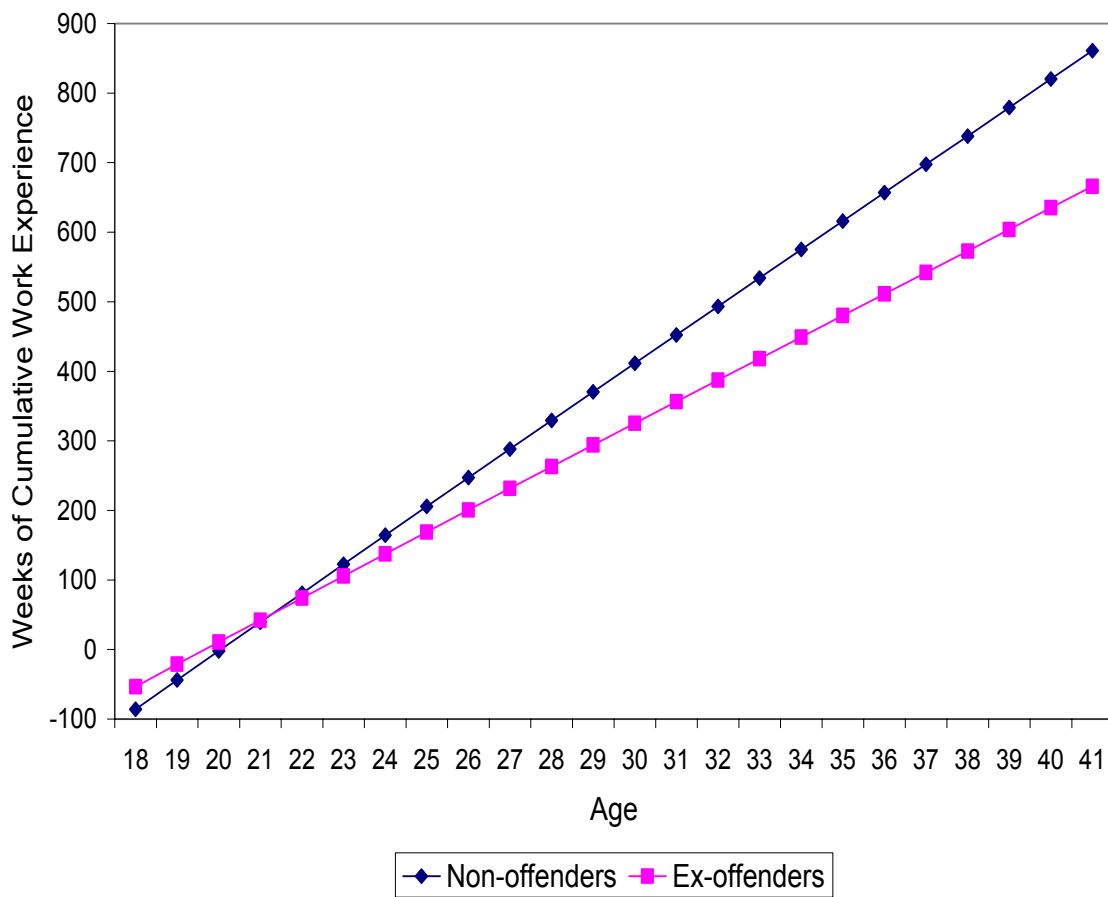


Figure 5.3. Predicted Values of Cumulative Work Experience by Offender Status, NLSY Men, 1979-1998

Based on Model 6, the predicted values of cumulative work experience are graphed by offender status and race/ethnicity in Figure 5.4. The graph illustrates that there are race/ethnic differences cumulative work experience for non-offenders and ex-offenders. Between the ages of 18-22, Latino ex-offenders and non-offenders have similar work experience trajectories. The experience trajectories of the Latino ex- and non-offenders are slightly higher than the trajectories of African American and white ex-offenders and non-offenders. The trajectories for Latino ex-offenders and non-offenders begin to converge by age 21. By age 27, Latino non-offenders begin to receive higher returns to work experience and gap between Latino non-offenders and ex-offenders increases. After age 27, the white and African American non-offenders begin to accumulate more work experience than Latinos. From this point on, there is a small gap in cumulative work experience among white and African American non-offenders. By age 37, a white non-offender has only 33.83 more weeks of cumulative work experience than an African American non-offender. Late in the career, the Latino non-offender cumulative work experience trajectory has a lower slope than the trajectory of the white non-offender. By age 37, the Latino non-offender has only 82.50 fewer weeks of experience than the white non-offender.

Among the ex-offenders, white and African American ex-offenders have more weeks of cumulative work experience than Latino ex-offenders. The gap between white ex-offenders and African American ex-offenders is relatively small, white ex-offenders have only 33 more weeks of experience than African American ex-offenders. By age 37, white ex-offenders have 82.50 more weeks of experience than Latino ex-offenders. The African American ex-offenders have 48.67 more weeks of experience than Latino ex-offenders. The graph illustrates that there are race/ethnic differences in cumulative work experience among ex-offenders and non-offenders. White and African American ex-offenders have similar experience trajectories across the career. For Latino, ex-

offenders, they have higher levels of cumulative work experience than white and African American ex-offenders early in the career. However, late in the career, Latino ex-offenders do not accumulate as much experience as white and African American ex-offenders. This same pattern is repeated among the non-offenders. Specifically, Latino non-offenders have more cumulative work experience early along the career trajectory. Then white and African American non-offenders begin to surpass the Latino non-offenders experience levels later in the career. Within all three race/ethnic statuses, incarceration decreases cumulative work experience. It appears that early in the career, Latinos who go to prison have better experience trajectories than whites or African Americans who go to prison. However, the prison experience has more serious consequences on the late career trajectory of Latino ex-offenders.

When I examine the comparison across non-offenders and ex-offenders, I found that there is a small emergent career gap in cumulative experience between those who have gone to prison and those who have not. Since I have controlled for unemployment, this means that those who have been to prison must have higher employment turnover than non-offenders. This suggests that ex-offenders must be quitting or being fired at higher rates.

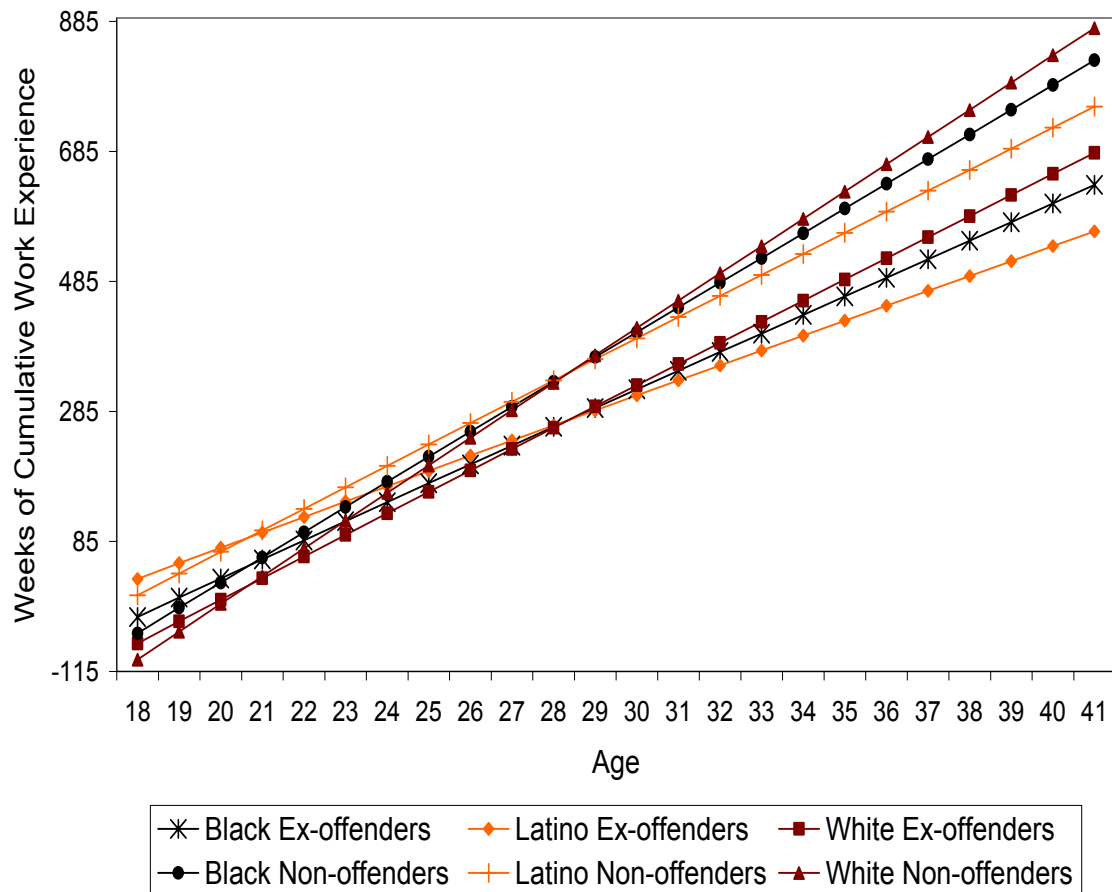


Figure 5.4 Predicted Values of Cumulative Work Experience by Offender Status and Race/Ethnicity, NLSY Men, 1979-1998.

5.5 Discussion

In this chapter I examined the impact of incarceration on cumulative work experience. The presentation of the observed charts for cumulative work experience by offender status and offender status by race/ethnicity provide information concerning the distribution of the mean values for these respective subgroups of men. The fixed effects models tested the hypotheses pertaining to the influence of incarceration on cumulative work experience net of other factors. The models supported the hypothesis that ex-offenders have fewer weeks of cumulative work experience. The models support the

hypothesis that minority ex-offenders have fewer weeks of cumulative work experience than white ex-offenders net of cumulative unemployment.

After controlling for exogenous human capital and other factors (i.e., cognitive skill, education, marital and enrollment status, and fixed effects of personal history and period) in the fixed effects models, the results indicate that the likelihood of gaining work experience throughout the career decreases for ex-offenders. The implication of this finding is that regardless of exogenous human capital acquisition, the stigma associated with incarceration potentially limits employment opportunities and creates firm-specific skill deficits among ex-offenders. This process is theorized to occur as a function of three mechanisms. First, since incarceration weakens social capital, ex-offenders' social networks may lack information about employment opportunities that lead to gaining valuable work experience. Second, ex-offenders may be relegated to spot-market jobs, which have little stability. The inability to gain stable employment reduces opportunities for ex-offenders to acquire firm-specific skills. Employers typically view job applicants that have acquired firm-specific skills through labor force participation as attractive workers, because they tend to spend less money to train these applicants. In addition, the impact of cumulative unemployment also conditions the association between cumulative work experience and incarceration. For instance, if an ex-offender experiences numerous unemployment spells throughout the career, those unemployment spells minimize the cumulative work experience of the offender. Thus, the longer an ex-offender is unemployed, the less cumulative work experience can be accumulated. Third, in the event that an ex-offender secures employment, then the likelihood of job turnover increases. Employers may be more likely to fire ex-offenders particularly if they feel the ex-offender is not developing the skills necessary to perform the job. Also, ex-offenders may be more likely to leave their job if they feel that the stigma of being an "ex-con" shapes how the employer or other workers may evaluate

their performance. As the results of this chapter suggest, due to stigma, weak social capital and high turnover, ex-offenders are less likely to accumulate work experience throughout the career.

5.6 Summary

This chapter examines the impact of incarceration on cumulative work experience. The results indicate that incarceration decreases work experience throughout the career for ex-offenders. Also, the findings from this chapter suggest that the relationship between incarceration and cumulative work experience is influenced by the race/ethnicity of the ex-offender. As a result of lower levels of work experience, ex-offenders are not afforded opportunities to accumulate human capital. The findings from this chapter further provide support the theoretical argument that incarceration disrupts the career trajectory.

CHAPTER 6

THE IMPACT OF INCARCERATION ON CAREER EARNINGS

6.1 Introduction

According to the literature, prison time can disrupt key life transitions. One of the major transitions that incarceration affects is the ability to gain stable employment. In this chapter, I will investigate the question of whether incarceration reduces ex-offenders access to career jobs that produce steady earnings growth among young men. I examine the impact of incarceration on career earnings with the estimation of the proposed earnings models. The dependent variable is log hourly wage. Hourly wage is conceptualized to reflect the earnings mobility of young workers across the career. In these models I isolate the influence of prison time on the wage trajectory. Specifically, I investigate three questions: (1) whether there are differences in hourly wage among ex-offenders and non-offenders throughout the career, net of other factors and (2) whether there is racial/ethnic variation in the hourly wages of white, Latino and African American ex-offenders and (3) if the effect of prison on career earnings trajectories is largely produced via the accumulation of human capital within the labor market. The estimates generated from these models allow me to explore the proposition that the stigma or social capital effects of incarceration are more detrimental for minorities. To do this hourly wages of these men are regressed on offender status, controlling for the number of hours worked, marital status, central city residence, suburban residence, cognitive skill, school enrollment and educational attainment. In addition to the use of these statistical controls, I also able to model the unmeasured but stable person and year influences (i.e., fixed effects). From these models, I have relatively strong confidence that they actually estimate the consequences of incarceration. I introduce an interaction term race/ethnicity by prior incarceration to address the issue of racial/ethnic variation in the hourly wage of ex-offenders.

6.2 Observed Log Hourly Wage Patterns

Figure 6.1 charts the observed log hourly wage-age trajectories for ex-offenders and non-offenders. In general, non-offenders have higher hourly wage trajectories across the career than ex-offenders. At age 18, ex-offenders and non-offenders have essentially equal hourly wages. By age 20, a small gap in the wage trajectory begins to develop between ex-offenders and non-offenders. An average 20-year-old ex-offender earns an hourly wage that is 32% less than the hourly wage of an average non-offender. This wage disparity continues to grow across the career. By age 37, the gap between ex-offenders and non-offenders is larger¹. At this point in the career, an average 37-year-old ex-offender earns an hourly wage that is 51% less than the hourly wage for an average non-offender. It appears that going prison does contribute to ex-offenders having flatter wage trajectories across the career. However, the reader must note that the graph in Figure 6.1 does not control for all the possible covariates that are related to going to prison. Therefore, other factors could contribute to the perpetuation of inequality surrounding wage disparities throughout the career.

¹Over time, year-to-year fluctuations have resulted in a small number of 41 year olds being interviewed. In order to discuss the earnings trajectories for the sample, I will only examine the late career trajectories for 37-year-old males.

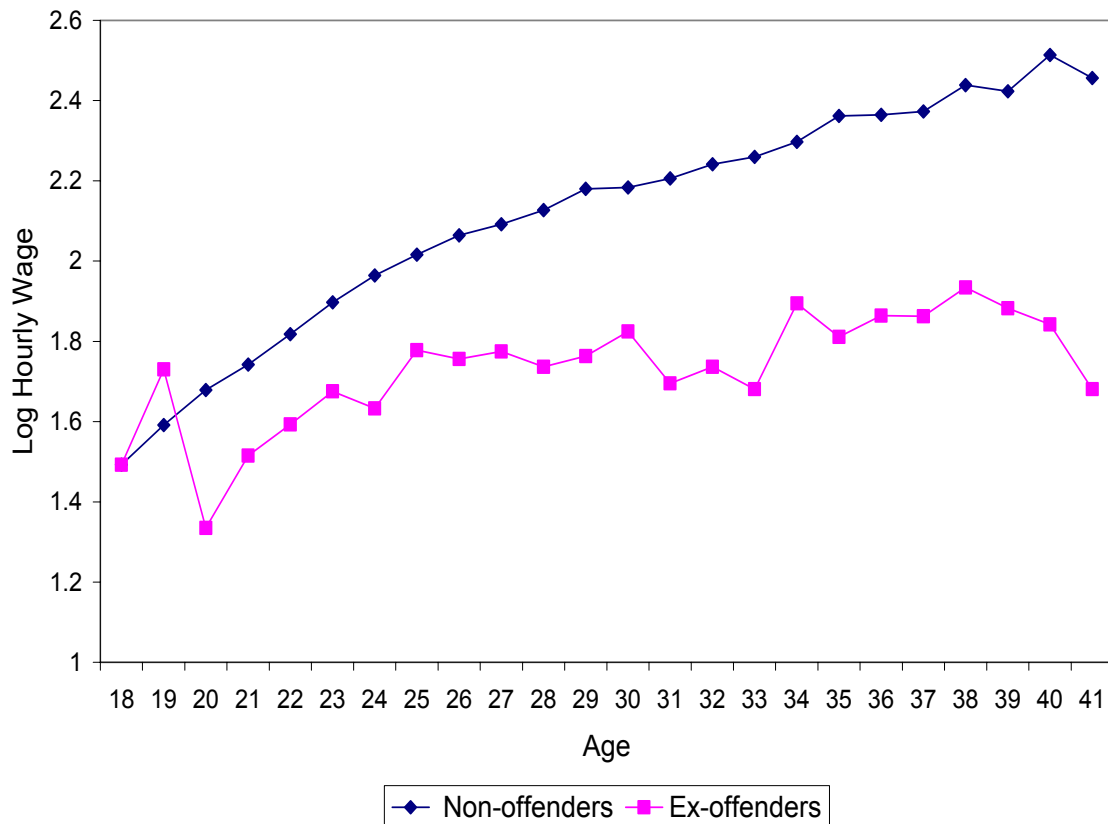


Figure 6.1. Observed Log Hourly Wage by Offender Status, NLSY Men, 1979-1998

Figure 6.2 graphs observed log hourly wage for ex-offenders and non-offenders by race/ethnicity. The pattern of non-offenders having higher hourly wages than ex-offenders is repeated in this chart. Early in the career, the difference between the wage trajectories for non-offenders and ex-offenders is very small. Around age 28, a pattern based upon offender status and race/ethnicity emerges. According to this pattern, the average white non-offender has a higher hourly wage than the average Latino and the average African American non-offender. Although the trajectories for white, Latino and African American ex-offenders are subject to numerous fluctuations, the same pattern holds. The average white ex-offender has a slightly higher hourly wage than the average Latino and the average African American ex-offender. For both groups, this pattern continues along the career

trajectory. The chart presented in Figure 6.2 demonstrates ex-offenders have lower hourly wages than non-offenders and that African American ex-offenders earn lower hourly wages than Latino and white ex-offenders. The chart, however, does not suggest that there is an interaction between race/ethnicity and prison experience. The wage trajectories for the prison population fluctuate a great deal year-to-year. It remains to be seen if such an interaction exists in the multivariate context.

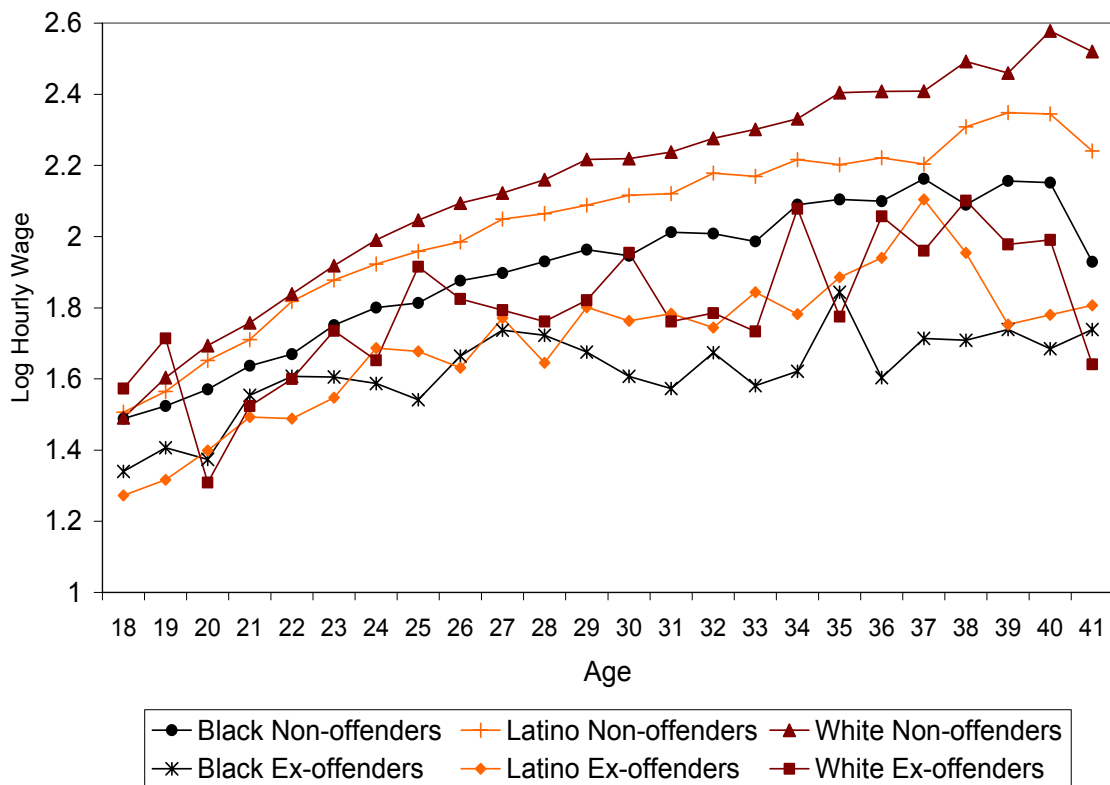


Figure 6.2. Observed Log Hourly Wage by Offender Status and Race/Ethnicity, NLSY Men 1979-1998

6.3 Fixed Effects Model Estimates

The literature concerning the impact of incarceration on career earnings suggest that incarceration disrupts the career trajectory of ex-offenders by limiting opportunities for ex-offenders to accumulate human capital. In these models, I examine how incarceration influences earnings inequality across the career with statistical controls for both fixed effects and age related exogenous effects such as education and marriage. By controlling for these factors, I can see how prison influences the career trajectories of ex-offenders. The general fixed effects model is presented below:

$$\begin{aligned} \text{Wages}(\ln)_{it} = & \alpha_t + \beta_1 \text{Age}_{it} + \beta_2 \text{Jail}_{it} + \beta_3 \text{PriorJail}_{it} + \beta_4 \text{Education}_{it} + \beta_5 \text{Age Education}_{it} \\ & + \beta_6 \text{Age PriorJail}_{it} + \beta_7 \text{Age Black}_{it} + \beta_8 \text{Age Latino}_{it} + \beta_9 \text{Black Prior Jail}_{it} + \beta_{10} \text{Latino} \\ & \text{Prior Jail}_{it} + \beta_{11} \text{Age Black Prior Jail}_{it} + \beta_{12} \text{Age Latino Prior Jail}_{it} + \beta_{13} \\ & \text{Unemployment}_{it} + \beta_{14} \text{Mean Work Experience}_{it} + \beta_{15} \text{Tenure}_{it} + \beta_{16} \text{Control}_{it} + Z_i + \epsilon_{it} \end{aligned}$$

where

$\text{Wages}(\ln)_{it}$	=	The natural log of hourly wages in time t
Z_i	=	Characteristics that are measured and stable over time (e.g., Race/Ethnicity, Cognitive Skill)
α_t	=	Fixed effect for unobserved and observed differences across individuals that are stable over time
Age_{it}	=	Respondent's age in time t
Jail_{it}	=	Current Incarceration in time t
Prior Jail_{it}	=	Prior Incarceration in time t
Education_{it}	=	Years of education in time t
$\text{Age Education}_{it}$	=	Product term for age and education in time t
$\text{Age PriorJail}_{it}$	=	Product term for age and prior incarceration in time t
Age Black_{it}	=	Product term for age and Blacks in time t

Age Latino_{it}	=	Product term for age and Latinos in time t
$\text{Black Prior Jail}_{it}$	=	Product term for Blacks and prior incarceration
$\text{Latino Prior Jail}_{it}$	=	Product term for Blacks and prior incarceration in time t
$\text{Age Black Prior Jail}_{it}$	=	Product term for age, Blacks and prior incarceration in time t
$\text{Age Latino Prior Jail}_{it}$	=	Product term for age, Latinos and prior incarceration and in time t
$\text{Mean Work Experience}_{it}$	=	Mean of cumulative work experience in time t
Control_{it}	=	Control variables in time t
ϵ_{it}	=	The disturbance term in time t

Table 6.1 reports the results of Models 1 through 6 concerning the influence of incarceration on hourly wage. In model 1, there is a significant relationship between hourly wage and educational attainment. For each additional year of education, hourly wage increases by 5% controlling for hours worked per week, marital status, school enrollment, city residence, and suburban residence. Also there is a significant relationship between hourly wage and age. Along the career trajectory, hourly wages increases by 3% per year. Two interaction terms are featured in Model 1, age by cognitive skill, and age by education. These interactions are significant. Increases in cognitive skill increase hourly wage across the career. Each additional year of education increases hourly wage across the career.

Most importantly in Model 1, there is a significant relationship between log hourly wage and prior incarceration. For men who have even been to prison or jail, hourly wage decreases by 11%, controlling for hours worked per week, marital status, school enrollment, city residence, and suburban residence and the fixed effect.

Models 2 and 3 introduce interaction terms for age by prior incarceration and age by race/ethnicity respectively. In Model 2, the interaction term age by prior incarceration is

significant. Thus, the effect of prior incarceration is conditioned by age. Ex-offenders' hourly wages decrease by 1.2% per year across the career. In Model 3 there are significant differences in hourly wages by race/ethnicity. On average, the hourly wages for African American males decrease by 0.5% per year relative to whites males. Latinos wages decrease 0.2% per year relative to white men across the career. The age by prior incarceration interaction is not reduced in model 3 by the inclusion of age by race/ethnicity interaction terms. Thus the high proportion of minority males in the prison population does not contribute to the flatter career trajectory of men who have been to prison. Therefore, the results of Model 3 support *Hypothesis 1: Incarceration has a negative effect on earnings and Hypothesis 2: Ex-offenders have lower earnings trajectories across the career than non-offenders.*

Model 4 includes the interactions race/ethnicity by prior incarceration. The interaction terms black by prior incarceration and Latino by prior incarceration are not statistically significant in this model. Therefore, this model does not support *Hypothesis 3: The costs of imprisonment are higher for minority ex-offenders than for white ex-offenders.* I also estimated an additional model, which included an interaction term age, by race/ethnicity by prior incarceration. The results of this model suggest that the impact of incarceration on hourly wages does not vary by race/ethnicity or age.

Models 5 and 6 introduce endogenous human capital variables to the earnings analysis. The first endogenous labor market variable I examine is cumulative unemployment (Model 5). There is a significant relationship between hourly wage and cumulative unemployment. Cumulative unemployment decreases hourly wage by 1.3% on average across the career. Including cumulative unemployment in the model decreases the main effect of prior incarceration on hourly wage from 8.7% (Model 4) to 4.7%. The interaction effect of age by prior incarceration decreases from 1.2% (Model 4) to 1.0%. Therefore, part of the stigma associated with incarceration can be considered a combination

of factors dealing with prison time as well as factors contributing to the spotty work histories produced by prison time.

In Model 6, I introduce two other variables endogenous to the labor market, tenure and mean work experience². The relationships between hourly wage and job tenure and hourly wage and mean work experience are statistically significant. As job tenure and mean work experience increase, hourly wage also increases. Once job tenure and mean work experience are introduced in the model, the main effect of prior incarceration is no longer statistically significant. However, the interaction age by prior incarceration remains statistically significant, but decreases from 1.0% to 0.7%. The results indicated in the earnings models demonstrate that imprisonment lowers hourly wages across the career. These models also suggest that the effect of prison is primarily mediated by its influence on endogenous human capital, which in turn affects the career trajectories of ex-offenders.

² Mean work experience is defined as cumulative work experience (weeks)/years in the labor force. This number provides the average person mean of weeks worked per year.

Table 6.1. Fixed Effect Models of Career Earnings on Selected Variables for NLSY Men, 1979-1998 (Person Years = 69,133)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Current Incarceration	0.028* (1.68)	0.008 (0.47)	0.008 (0.49)	0.007 (0.46)	0.008 (0.51)	-0.005 (0.31)
Prior Incarceration	-0.11*** (7.95)	-0.080*** (5.25)	-0.071*** (4.76)	-0.087*** (3.88)	-0.047*** (3.14)	-0.041 (1.83)
Education	0.05*** (25.15)	0.05*** (25.20)	0.05*** (25.40)	0.05*** (25.40)	0.05*** (25.44)	0.052*** (25.12)
Age	0.03*** (77.41)	0.03*** (77.10)	0.03*** (74.68)	0.03*** (74.66)	0.03*** (77.03)	0.022*** (49.17)
Age*Cognitive Skill	0.007*** (18.16)	0.007*** (17.49)	0.005*** (12.40)	0.005*** (12.37)	0.005*** (10.63)	0.005*** (12.22)
Age*Education	0.002*** (13.38)	0.002*** (13.22)	0.002*** (14.40)	0.002*** (14.38)	0.002*** (11.98)	0.0016*** (10.55)
Age*Prior Incarceration		-0.012*** (7.51)	-0.012*** (6.94)	-0.012*** (7.00)	-0.010*** (6.03)	-0.009*** (4.06)
Age*Black			-0.005*** (7.25)	-0.005*** (7.32)	-0.004*** (5.43)	-0.005*** (7.12)
Age*Latino			-0.002*** (2.58)	-0.002** (2.56)	-0.002** (2.79)	-0.002*** (3.26)
Black*Prior Incarceration				0.033 (1.05)	0.029 (0.90)	0.052 (1.63)
Latino* Prior Incarceration				0.015 (0.38)	0.016 (0.39)	0.004 (0.93)
Cumulative Unemployment					-0.013*** (20.34)	-0.0009** (13.34)
Tenure						0.00016*** (14.77)
Work Experience						0.008*** (31.12)
R ²	0.608	0.608	0.609	0.609	0.611	0.619

Absolute value of t statistic in parentheses

*p<.05 **p<.01 ***p<.001 (one-tailed tests)

+p<.05 ++p<.01 +++p<.001 (two-tailed tests)

Note: Time-invariant main-effects are excluded from fixed-effects models. These estimates are based upon variables centered around the grand mean. The variables are unstandardized estimates. Table 6.1 presents results for variables of substantive interest only. All models include the following control variables: hours worked per week, marital status, city residence, suburban residence, and current school enrollment. The control variable results are presented in the Appendix, Table A.4.

6.4 Predicted Values for Earnings Models

Figure 6.3 charts the predicted values for earnings across the career. The predicted value calculations are based upon Models 3 and 5. Using Model 3 to calculate predicted values allows me to examine the influence of offender status on career earnings. The predicted values calculated using Model 5 allow me to examine the race effect on earnings. All predicted values are calculated at the sample mean for all other variables except marital status and current school enrollment. These two variables are strongly related to age and hourly wage. Therefore, age specific means for current school enrollment and marital status are used in the estimation of predicted log hourly wages.

Based on Model 3, Figure 4.3 presents the predicted values of log hourly wage graphed by offender status and race/ethnicity. Net of other, primarily exogenous, factors, early in the career, ex-offenders are predicted to earn slightly more than similar non-offenders between the ages of 18 through 23. Around age 24, non-offenders begin to earn more than ex-offenders. This earnings disparity grows across the career. By age 37, the ex-offender has an hourly wage of \$7.17 (antilog 1.97) and the non-offender has an hourly wage of \$8.58 (antilog 2.15). The predicted gap at age 37 is \$1.41. The observed gap in Figure 6.1 is \$4.27. Since prison time decreases hourly wages, about 33% of the decrease in hourly wages of prisoners by age 37 is estimated to be a function of prison time and 67% is a function of the other factors in the model including educational achievement, marriage, race/ethnicity and fixed but unmeasured individual effects.

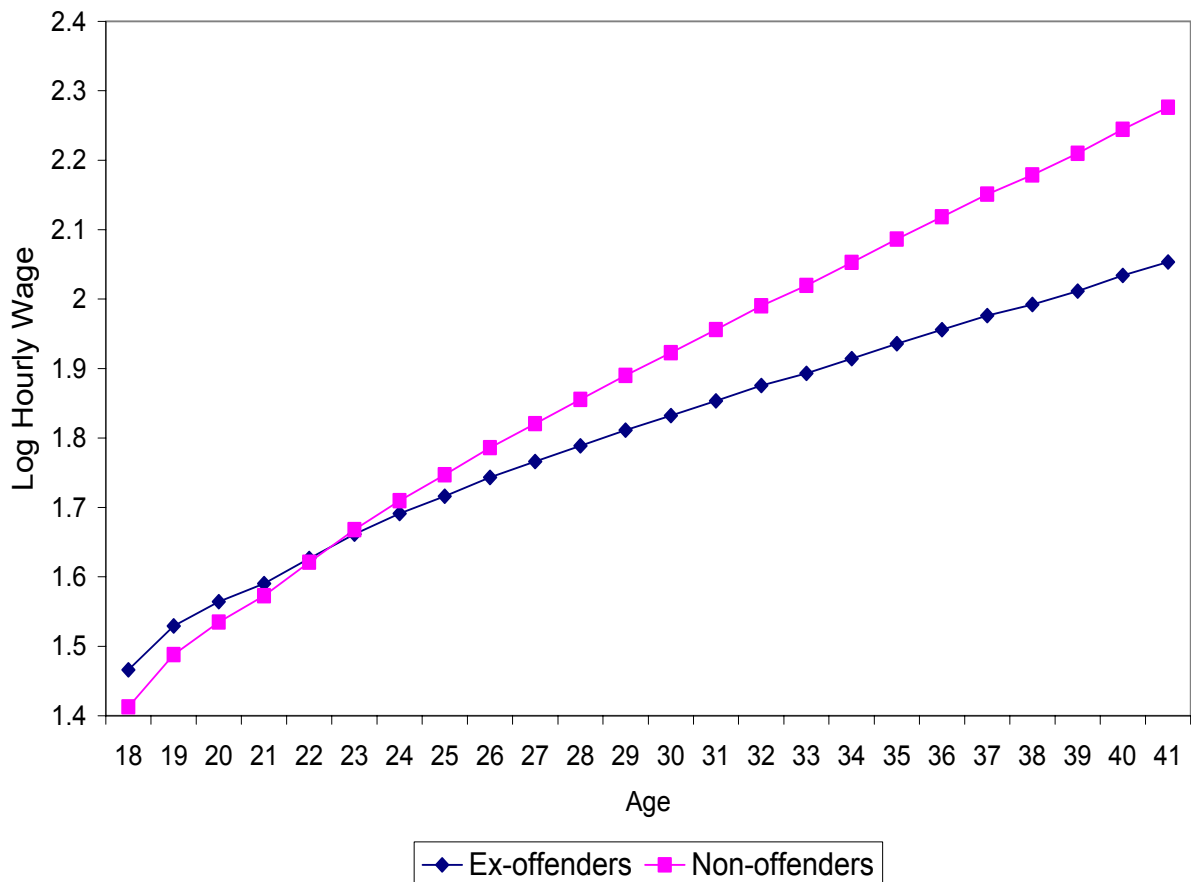


Figure 6.3 Predicted Values of Log Hourly Wage by Offender Status, NLSY Men, 1979-1998

Based upon Model 6, the predicted values of log hourly wage are graphed by offender status and race/ethnicity in Figure 6.4. The graph shows that there are race/ethnic differences in hourly wage for ex-offenders and non-offenders. Thus, race/ethnicity does influence the likelihood of ex-offenders earning higher wages. Early in the career, there is little variation in the earnings trajectories for non-offenders and ex-offenders by race/ethnicity. At age 27, the earnings trajectories for non-offenders and ex-offenders begin to diverge. A pattern develops in which non-offenders earn higher hourly wages than ex-offenders. Within the respective offender categories, the

race/ethnic gap in hourly wages is small and this pattern remains throughout the trajectory.

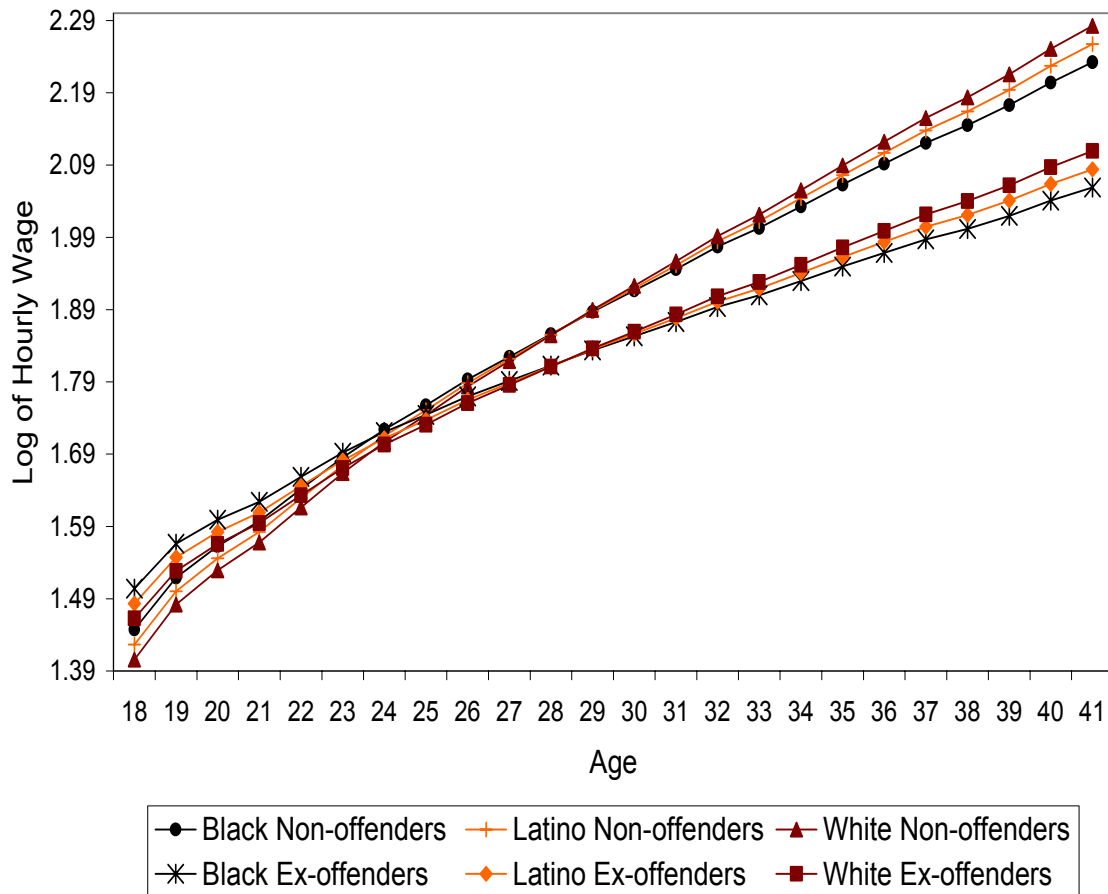


Figure 6.4. Predicted Values of Log Hourly Wage by Offender Status and Race/Ethnicity, NLSY Men, 1979-1998

6.5 Discussion

In this chapter, I examined the impact of incarceration on career earnings. The presentation of the observed charts for log hourly wage by offender status and offender status by race/ethnicity provide information concerning the distribution of the mean earnings values for these respective subgroups. The fixed effects models tested the hypotheses pertaining to the influence of incarceration on earnings net of other factors.

The models supported the hypotheses that incarceration has a negative effect on earnings and that ex-offenders have lower earnings trajectories than non-offenders. This relationship is reduced but holds, controlling for cumulative unemployment. When tenure and work experience were introduced in the model, the incarceration effect became non-significant, but the age by incarceration interaction remained negative. The models did not support the hypothesis that minority ex-offenders have lower earnings than white ex-offenders produced by an interaction between prison experience and race/ethnicity.

The results from these models have several implications. First, the impact of incarceration on earnings may be conditioned by the timing of the prison experience. For example, early in the career of an ex-offender, they may be able to secure spot market jobs with high hourly wages and little to no job stability. But later in the career, the likelihood of ex-offenders being able to obtain career jobs decreases, due to the stigma associated with incarceration. Around age 25, many young non-offenders begin securing career jobs. However, the ex-offender's prison time makes him less attractive to employers and limits his ability to embark upon a career due to a lack of exogenous human capital (i.e., education and skills) as well as the endogenous human capital, stigma, and social capital consequences of prison. This deficit of human and social capital may contribute to the ex-offender not being able to earn higher hourly wages.

Second, the finding that the coefficients of the age by incarceration interaction effect decreases when endogenous human capital variables such as work experience and tenure are present in the model makes a theoretical contribution to the literature. This finding suggests that the relationship between incarceration and earnings is mediated by the accumulation of endogenous human capital. Although the stigma associated with incarceration grows over the career, the extent to which employers process workers based upon this stigma is shaped by the human capital that ex-

offenders have accumulated across the career. The findings from these models stress the importance of evaluating measures of human capital that are generated outside the labor market versus inside the labor market. By making this distinction, I could control for differential career returns to education and age that may be due to opportunities to accumulate work experience and tenure across the career.

In this study, I found that the earnings penalty associated with incarceration did not vary by race/ethnicity, which contradicts Western's (2002) finding. Estimating separate models for whites, Latinos and African Americans, Western finds that the wage decline experienced by whites and Latinos is roughly the same. However, he finds that African Americans experience a slightly smaller wage decline relative to whites and Latinos. Western did not formally test to see if this difference for African Americans was significantly different from the wage decline of whites and Latinos. Therefore, he indirectly tested his hypothesis. However, I modeled this relationship using interactions, which directly tests whether the earnings penalty varies by race as oppose to initially assuming that career process is distinct for white, Latinos and African Americans. The results from my models suggests that the slightly smaller difference in wage decline that Western found for African Americans is not significantly different from the wage decline experienced by whites and Latinos.

The results of Model 6 demonstrate that the accumulation of endogenous human capital for ex-offenders is particularly problematic. As a result of not having access to endogenous human capital, ex-offenders are more likely to experience unemployment spells and lower earnings over time. This chapter illustrates that the impact of incarceration on earnings is mediated by access to endogenous human capital.

6.6 Summary of Individual Level Analysis

In Chapter 4 through 6, I have examined the impact of incarceration on three key labor market outcomes: cumulative unemployment, cumulative work experience and career earnings. As a result of being incarcerated, ex-offenders have higher levels of cumulative unemployment and lower levels of cumulative work experience and earnings. For each of these relationships, there is a prison effect, which indicates that incarceration contributes to more cumulative unemployment, fewer weeks of cumulative work experience and lower earnings. In addition the relationship between incarceration and cumulative unemployment and incarceration and cumulative work experience is shaped by the race/ethnicity of the ex-offender. However, in the case of earnings, there is not a difference in the career trajectory of ex-offenders by race/ethnicity. One limitation of these models so far is that they do not take into account spatial context. In Chapter 7, I will examine how incarceration impacts the career earnings for ex-offenders living in particular labor market or residential contexts.

CHAPTER 7

THE IMPACT OF INCARCERATION AND SPATIAL CHARACTERISTICS ON CAREER EARNINGS

7.1 Introduction

In this chapter, I examine spatial level processes to discover if the earnings of ex-offenders are shaped by the characteristics of the labor markets where they reside. The dependent variable is log hourly wage and there are 36,946 person years for the male sub-sample of the NLSY who live in urban areas. In the theoretical model, MSAs characterized by high violent crime rates, high unemployment rates, large minority populations and high levels of residential segregation are hypothesized to decrease earnings for ex-offenders relative to non-offenders residing in the other MSAs. Similar predictions are made for racial earnings patterns. In cities with these spatial contexts, ex-offenders may have additional difficulty finding work and are expected to have lower hourly wages relative to ex-offenders in other communities. I investigate this issue by examining models that contain the following structural covariates: violent crime rates, unemployment rates, Black/White index of residential dissimilarity, Latino/White index of residential dissimilarity, percent African American, and percent Latino residing in the MSA in interaction with prior incarceration and race.

This chapter contains a discussion of a theoretical model which links four plausible mechanisms: 1) perceived threat of criminality, 2) labor demand, 3) perceived threat of minority population and 4) spatial mismatch and residential segregation to offender/non-offender disparities in earnings. Next, I discuss how these four mechanisms may lead to racial/ethnic earnings disparities for ex-offenders. Then, I present hypotheses that are derived from the theoretical discussion. Finally, I provide a description of the data, variables, models and modeling strategy that I use when investigating the impact of spatial

context on the relationship between incarceration and individual earnings at the MSA level. The data and methods section of this chapter is followed by a discussion of the results derived from random effects model estimates.

7.2 Spatial Processes of Racial/Ethnic Inequality

I use a demand-side perspective to examine differential opportunities within local labor markets. The demand side of the labor market provides information concerning the nature and characteristics of jobs and information about the employers who make hiring decisions. In the context of this discussion, I will focus on how employers might consider labor market characteristics in the context of making recruiting, hiring and workplace location decisions.

Tilly, Moss, Kirschenman and Kennelly (2001) discuss the significance of neighborhoods in metropolitan labor markets. They explore how employers think about urban space, and how race/ethnicity figures into the map of desirable locations for doing business, recruiting and hiring employees. They contend that employers are surrounded by a spatial environment and each manager forms his or her own mental map of that environment. The mental maps formed by employers have important effects on the labor market outcomes for racial/ethnic groups.

Using the Multi-City Study of Urban Inequality (MSCUI) Face-to-Face Employer Survey, Tilly et al., interviewed three types of employers: the Chief Executive Operating Officer on site, the Personnel Manager and the Line Manager/Immediate Supervisor who managed employees in the sample job at each establishment located in the cities of Atlanta, Boston, Detroit and Los Angeles. From these interviews, Tilly et al.. emphasized that race/ethnicity and space are entangled when employers' make decisions about hiring and locating work sites. Specifically, geographic space is a signal to employers. For instance, the location of certain neighborhoods may evoke stereotypes that employers may associate

with the residents and then draw inferences about the quality of workers from these neighborhoods. These perceptions are strongly influenced by the actual or perceived racial (as well as class) composition of neighborhood residents (306). As a result of these signals, employers try to avoid these areas in their location and recruitment practices.

The importance of place in determining labor market opportunities was also present in the employment interview data analyzed by Kirschenman and Neckerman (1991) and Tilly et al. (2001). In interviews with Chicago employers, Kirschenman and Neckerman found that African American applicants from ghetto neighborhoods, especially those from “the projects” were assumed to be particularly deficient. Home address was a distinguishing mark to many employers. These employers take residence into account when deciding not to hire otherwise qualified minority candidates.

Likewise, Tilly et al. found that employer perceptions of the location where African American populations are concentrated shape their recruiting, hiring and location practices. In many employers’ minds, white areas are linked to positive workforce attributes, while African American and Latino areas are linked to negative attributes. For example, Atlanta employers in the southern suburbs implicated areas where African American populations are high and viewed as undesirable, both from customers and employers’ standpoints. According to a white assistant director of a government agency, “the whole south side of Atlanta is fairly high on blacks, which makes a lot of whites nervous coming down in this area.”

Tilly et al. argue employers’ images of neighborhoods having large minority populations influence their desirability as business locations but also employers’ views of workers from these areas. The authors demonstrate in their discussion of the interview findings that employers’ perceptions are closely attuned to the particularities of local social geography and race relations. The employers shared their concerns about the inner-city

workforce skills. They suggest these concerns are filtered and magnified through a racial lens that stigmatizes African American neighborhoods and workers.

Although the previous literature focuses on race, it seems plausible that spatial context might amplify or reduce the stigma employers perceive in reaction to criminal history. In this discussion of space as a signal, I examine four plausible mechanisms employers might consider when formulating decisions about certain neighborhoods and workers within labor markets. Then I discuss how these mechanisms might influence the behavior of employers within labor markets.

Mechanism 1: Perceived Threat of Criminality

When employers assess the spatial location of neighborhoods for locating businesses, recruiting or hiring workers, they consider several factors. In addition to considering the racial/ethnic composition of the neighborhood, employers may also be influenced by the perception of neighborhood crime.

While perceptions of neighborhood crime may be shaped by reality, research suggests that these perceptions are not simply a reflection of reality. For instance, Taub, Taylor and Dunham (1984) report substantial variation in perceptions of neighborhood crime when controlling for official measures of crime rates. Bursik and Grasmick (1993) suggest that reports of disorderly or uncivil conduct and visible signs of neighborhood housing deterioration also have an impact on perceptions of neighborhood crime. These researchers indicate that most neighborhood perceptions of crime are influenced by myriad factors individuals consider when actually gauging neighborhood conditions.

Quillian and Pager (2001) contend that neighborhood racial composition is a potentially important aspect of the neighborhood environment that may influence the perception of crime. They argue that a neighborhood's racial makeup and the stereotypes associated with race/ethnicity are likely to influence the perception of neighborhood crime.

First, a neighborhood's racial composition is an observable characteristic in the segregated United States, where most neighborhoods fall into the category of either mostly white or mostly African American (Massey and Denton 1993). Second, stereotypes associated with certain minority group members particularly African Americans, as criminals are deeply embedded in the collective consciousness of Americans, irrespective of the level of prejudice or personal beliefs (Quillian and Pager 2001:722). The authors state that these stereotypes are sufficiently powerful to lead to perceptions that African American neighborhoods have higher rates of crime than they actually do.

Studies find that African American neighborhoods do on average have higher rates of crime than white neighborhoods, although the association of neighborhood racial composition and crime tends to disappear in models that control for nonracial variables correlated with race, such as economic class variables (see Sampson 1987; Bursik and Grasmick 1993). However, the bivariate correlation between neighborhood racial composition and crime rates is one reason that stereotypes associating race and crime remain widespread (Quillian and Pager 2001).

Within the context of neighborhoods, racial stereotypes linked to crime are most likely to be activated by the presence of residents who closely approximate the profile of likely criminals. Quillian and Pager suggest that because of typical media portrayals and the demographic fact that young men commit a disproportionate number of crimes, the presence of young African American men is especially likely to activate stereotypes that link race and criminality. Using three data sources that contain individual and neighborhood characteristics, they examined the association between neighborhood racial composition and perception of crime. The authors found with respect to neighborhood racial composition there is a strong association between percentage of young African American men (ages 12-29) and the perception of the neighborhood's crime problem. Even when controlling for actual measures of the crime rate, the effect of percentage young African American men on

perceptions of crime appears to hold for African American and white respondents. To explore the possibility that neighborhoods characterized by signs of disorder in the physical environment and in the social environment may lead to the perception of high crime, Quillian and Pager controlled for measures of the social environment and the physical appearance of the neighborhood. The effect of young African American men on perceptions of crime remains strong and statistically significant after these controls are added. They contend that even in the presence of potentially endogenous measures of social disorder, the racial composition of one's neighborhood has a strong independent effect on perceptions of neighborhood crime.

General Propositions: Quillian and Pager's argument describes perceptions of crime at the neighborhood level, however, I extend their argument to discuss how employer perceptions of crime within the city shapes hiring decisions for ex-offenders and African American men. Employers in cities with higher crime rates will be more reluctant to hire ex-offenders and African American men, because of the increased perception of criminal threat. As the perception of criminal threat increases, employers are less to likely to hire neighborhood residents who live in crime-ridden areas. The stereotypes associated with race/ethnicity and the perception of crime can contribute to higher unemployment and lower earnings for neighborhood residents. Since ex-offenders are more likely to return to neighborhoods that are perceived as crime-ridden areas, the behavior of employers may have a strong effect on the labor market outcomes for this group. This effect may be particularly strong for minority ex-offenders, especially African Americans, due to the stereotypes associated with race and the difficulties African Americans face in the labor market.

Mechanism 2: Labor Demand

A demand perspective to explain labor market opportunities focuses upon the nature and characteristics of jobs as well as the impact of employer behavior concerning recruiting and hiring decisions. Variation in labor demand produces differential access to jobs both across and within labor markets. Murphy and Topel (1997) found that long-term changes in labor demand have reduced the returns to work among the least skilled. They suggest that declining labor-market opportunities have led to higher unemployment rates among men.

Labor demand will condition the amount of unemployment within the local labor market. If there are few or no jobs available, persons without jobs will remain unemployed longer, regardless of the human capital attributes they possess or how intense they search for employment. In areas where jobs are ample and a shortage of labor to fill those positions exists, the unemployed will probably be in a better position to end their spells of unemployment more quickly.

As labor demand shifted from the manufacturing to the service sector, the hiring of less-educated workers decreased. Holzer (1996) reports that young male high school graduates and dropouts of all race/ethnic groups earn 20% to 30% less per hour than workers did in the 1970s and they participate in the labor force less frequently. He suggests that since the education and skill levels of inner-city minorities tend to be lower than their inner city white counterparts, minority workers are particularly hit hard by these labor market changes.

Bound and Freeman (1992) examined the relative economic position of young African American men from 1973 to 1988. They used Current Population Survey (CPS) data to show that the relative African American economic advance ended in the mid-1970s. Subsequently, the racial earnings gaps for recent male entrants widened from 1976 to 1989, especially among African American college graduates and less educated men in the Midwest. Bound and Freeman explain the erosion of African American earnings in terms of

shifts in the relative demand and supply of specific groups that occurred within the context of weakened affirmative action and equal opportunity pressures.

To further examine the impact of industrial shifts for African American workers, Bound and Holzer (1993) estimate the effect of industrial shifts on the wages and employment of white and African American men. They use micro data from 1970 and 1980 Census to construct measures of changes in labor demand for white and African American males in manufacturing across 52 metropolitan areas with large populations of African Americans. Their results show that demand shifts away from manufacturing reduced employment and wages for African American and white males. However the employment declines are larger for African Americans than for whites in each age and educational category. The decline in employment was more pronounced for less-educated African American men. In fact, employment rates fell by one-third over the decade among young African American high school dropouts. Bound and Holzer contend that African Americans are probably more affected by declines in manufacturing because their skills do not allow them to make transitions to other industries as quickly or because the wages they may obtain in other industries are below their reservation wages. Furthermore, declines in African American employment rates may reflect geographic barriers and costs of relocation to suburban areas where manufacturing jobs are readily available. Overall, the shift in labor demand results in a higher metropolitan unemployment rate that has negative effects on the incidence and duration of joblessness for everyone, but especially for young African American and Latino males.

General Propositions: As the unemployment rate rises, the ability of employers to refuse to hire stigmatized ex-offenders increases. Given the historical connection between unemployment rates and the difficulties of African Americans in the labor market, this may be particularly true for African Americans.

Mechanism 3: Perceived Threat of Minority Population

Group threat theory (Quillian 1996) suggests that prejudice is a response to the feelings that certain privileges viewed as belonging to the dominant racial group are under threat by members of the subordinate group. Attitudes toward the other race are influenced by individual fears that their own race will be put at systematic disadvantage. Group threat emphasizes the feeling individuals have of belonging to a racial group and their view of the relations between groups as a source of racial attitudes (Quillian 1996:820).

One source that contributes to the feeling of group threat is size of the subordinate group relative to the dominant group. Blalock (1967) argues that subordinate group size is related to perceived threat for two reasons. First, the larger the subordinate population in a geographic area, the more likely the subordinate group competes with the dominant group for jobs and other economic resources. Second, large numbers of subordinate group members could potentially engage in collective action against the dominant group. These sources of threat are a consequence of the dominant group perception that minority concentration threatens their social or economic well-being.

Quillian (1996) suggests the most direct test of this hypothesis would be to examine if the percent minority population is related to an individual level measure of threat and then see if that threat measure is related to prejudice or discrimination. In the absence of an intervening threat measure, most studies have examined the relationship between city-level or regional level measures of the percent minority and measures of discrimination. These studies (Blalock 1956; Frisbie and Neidert 1977; Fossett and Kiecolt 1989) have found that as the percent African American concentration increases, African American-white inequality increases. Many studies (Seymyonov, Hoyt and Scott 1984; Tienda and Lii 1987; Beggs, Villemez and Arnold 1997; Cohen 2001;) test the influence of minority population on earnings within local labor markets. These studies found that there is a substantial penalty associated with being non-white in places with large non-white populations. They also

found that whites benefit economically when they live in places with a large non-white population.

General Propositions: As the percent minority in a community increases, minority wages decline relative to whites. Because criminal and racial threat tend to overlap in the minds of many employers, increased percent Black or Latino in the community may diminish earnings for ex-offenders over the career as well.

Mechanism 4: Spatial Mismatch and Residential Segregation

Another body of research points to the role of spatial mismatch within labor markets as conditioning the economic circumstances of minorities (see Kirschenman and Neckerman 1991; Holzer 1996). According to spatial mismatch theory, central cities have lost many low-skill jobs in all sectors. The loss of low skill jobs is a consequence of central cities being transformed from centers of goods production and distribution to centers of administration and information processing (Kain 1968; Kasarda 1989; 1995). Competition for scarce jobs in the inner city lowers wages and reduces employment among inner city residents; unless potential workers are willing to face a longer commute to the suburbs. If the cost of commuting for inner city residents is not offset by employers paying higher wages, this may lead to a disincentive for low-skilled inner city residents to seek paid work outside their neighborhoods (Kasarda 1989).

The “mismatch” aspect of this theory occurs when residential segregation by race restricts the employment opportunities of low-skilled inner city African Americans (Zax and Kain 1996). Housing segregation in particular, has been singled out as one of the most powerful local practices producing race/ethnic inequality (Massey and Denton 1993). One tactic used by residents to safeguard the market value of their property in a neighborhood is to maintain the neighborhood color line (Galster 1988). Maintaining the residential color line

generates a series of institutional practices and collective actions that prevent minorities from moving freely into any neighborhood they choose. Farley, Marshall and Stahura (1979) found that about half of white respondents would feel uncomfortable if about one-fifth of the people in their neighborhood were African American. When the number of African Americans in the neighborhood increases, whites move out of the neighborhood. As a result of white flight, housing values fall and investments in the neighborhood decline (Fong 1997).

Using 1980 census data, Massey and Denton (1993) assessed segregation across 30 Metropolitan Statistical Areas (MSAs)¹. They found that one-third of all African Americans live under conditions of intense racial segregation. They conceptualized segregation in terms of five distinct dimensions: unevenness, isolation, clustering, concentration and centralization.

Massey and Denton argue that a high score on any single dimension is serious because it removes African Americans from full participation in urban society and limits their access to its benefits. Not only were African Americans more segregated than other groups on any single dimension of segregation, but they were also more segregated on all dimensions simultaneously. In sixteen metropolitan areas, African Americans experienced what Massey and Denton referred to as hypersegregation, having high scores on at least four of the five dimensions at once (1993:74). This pattern of constant segregation remained for African Americans, regardless of income². In 1980, African American families earning under \$2,500 per year experienced an average segregation index of 86, families in the middle category displayed an index score of 81 and those families who earned more than \$50,000 had an average score of 83 (Massey and Denton 1993:86).

¹ In a larger series of articles, Massey and Denton examined segregation in 60 metropolitan areas. However, in *American Apartheid* (1993), Massey and Denton focus on examining segregation within in 30 MSAs that have the largest Black populations.

² The 1980 segregation indices discussed are calculated for three income categories: under \$2,500, \$25,000-27,500, \$50,000+ (Table 4.1 p.86).

Although U.S. Latinos are also relatively poor and disadvantaged, they do not experience hypersegregation in any metropolitan area. Overall, Latinos were never highly segregated on more than three dimensions. In the series of articles on segregation, Massey and Denton found that Latinos were highly segregated on the centralization dimension in forty-five of the sixty metropolitan areas. In 1979, Latinos who lived in the Los Angeles metropolitan area and earned under \$2,500 had a segregation index of 64. This index declined to 50 among Latinos earning \$50,000 or more (1993:86). Despite their immigrant origins, Spanish language and high poverty rates, U.S. Latinos are considerably more residentially integrated in U.S. society than African Americans.

Massey and Fischer (1999) updated Massey and Denton's work by using 1990 Census data. They computed segregation indices within income categories to assess how the residential segregation of African Americans, Latinos and Asians declines with rising socioeconomic status (SES). They calculated these indices for metropolitan areas, as well as central cities and suburbs to consider whether rising SES and suburbanization result in the spatial assimilation of minority groups. Their data indicate that African American segregation levels remain substantially above those of Latinos and Asians at all levels of income and regardless of whether they live in central cities or suburbs.

Across central cities, African American-White dissimilarity drops from .75 for poor families to .68 for lower middle class families. In contrast, levels of Latino and Asian segregation fall more dramatically from the poorest to the most affluent families. Latino-White dissimilarity drops from .51 for poor Latino families to .40 for affluent Latino families. Asian-White dissimilarity drops from .57 for poor Asian families to .45 for affluent Asian families. Within suburbs, levels of segregation are slightly lower for African Americans and slightly higher for Latinos and Asians. However, the basic pattern still remains: African American segregation is uniformly higher than that of other minorities regardless of income (Massey and Fischer 1990). The authors conclude that based upon the dissimilarity indices,

that there has been little change concerning the racial residential structure of suburban America.

An implication of this body of research is that segregation concentrates poverty within racially isolated neighborhoods and simultaneously increases the odds of socioeconomic failure within the segregated group. Within these neighborhoods, economic dislocations, such as the relocation of manufacturing to non-metropolitan areas and the decentralization of blue-collar employment from city to suburban areas, result in thousands of inner city workers, primarily men with little formal education being displaced from jobs that pay them relatively high wages. Subsequently, these workers enter a two-tiered service economy that generates a large number of menial low paying jobs and a few high paying jobs for workers without education or training (Massey and Denton 1993).

Given the unequal race/ethnic distribution of residences (Massey and Denton 1993), the composition of neighborhoods may result in differential allocation of employment opportunities within local labor markets. An implication of the spatial mismatch theory is that as segregation rises the racial distribution of workplaces tends to become more unequal, limiting the overall wage and employment opportunities of African Americans.

Using data from the Multi-City Study of Urban Inequality (MCSUI), Holzer (1996) found that across four cities: Atlanta, Boston, Detroit, and Los Angeles, whites are relatively more likely to work in suburban areas and African Americans in the central cities. The distribution of Latino and Asian workers is more mixed across both geographic areas. For example, the under representation of African Americans in manufacturing jobs among males is generally much larger in the suburbs than in the central cities. In the cities of Los Angeles and Boston, African American males virtually have no representation in the central city's manufacturing sector. However, in Los Angeles, high percentages of Latino males work in blue-collar and manufacturing employment in the central city and in the suburbs. The racial gaps in employment between the central cities and the suburbs are most severe in Detroit

and least severe in Los Angeles. Holzer contends that differences in employment locations for African Americans and Whites across metropolitan areas parallel the racial segregation of the residences and the distinction between the central city and the suburbs.

Holzer (1987) found evidence that inner-city residents have poor information concerning the spatial distribution of job opportunities within local labor markets. These residents were not aware of the large percentage of suburban jobs available to low-skilled workers. Instead of relying on formal job search methods such as the classifieds, or using an employment agency, inner-city residents rely heavily on friends and relatives and direct applications without referrals. Holzer suggests that the information on available job opportunities may diminish as the job's distance from the neighborhood increases. Likewise, Wilson (1987) has argued that minorities living in underclass neighborhoods have poor information about legitimate jobs because they lack contact or interaction with individuals and institutions that represent mainstream society.

Similarly, Ihlanfeldt (1997) found that African American workers without college degrees have poor information concerning the spatial distribution of jobs openings within the Atlanta metropolitan area. He attributes this finding to the residential segregation that exists within the metro-Atlanta area. For example, the share of the region's jobs available for low skilled workers in the northern suburbs increased from 40% to 52% between 1980 and 1990. The racial composition of the northern Atlanta suburbs contains 65% of the region's whites but only 18% of the region's African Americans. On the other hand, the share of the region's jobs available for low skilled workers located in the City of Atlanta declined from 40% to 29% over the same period. The racial composition of the city contains 39% of the region's African Americans, but only 7% of the region's whites. The southern suburbs contain 43% of the region's African Americans but only 28% of the white population. Ihlanfeldt suggests that since the northern suburbs are disproportionately white, African Americans may believe they are excluded from suburban jobs because of labor or housing

market discrimination. As a result, African Americans may be less likely to have knowledge of the available job opportunities in this region.

General Proposition: As residential segregation increases, the supply of locally available jobs for minorities decreases and negative stereotypes about minorities are intensified, thus leading to lower wages for African Americans and Latinos in high segregation cities. The decreasing number of low skill jobs in the central city coupled with the status quo of maintaining the residential color line, severely restricts inner city minority access to employment opportunities located in the suburbs. Therefore, the spatial distribution of jobs influences the labor market outcomes of minorities, particularly African Americans. The implication of residential segregation for ex-offenders is developed in the next section.

7.3 Racial/Ethnic Inequality, Incarceration and Spatial Effects on Labor Market Outcomes

This section expands upon the implications of spatial mismatch for the career prospects of ex-offenders. Based upon the literature, I suspect that the impact of spatial processes on the incarceration-earnings relationship may be race-specific. Within the context of this discussion, I present research that examines racial disparities in labor market outcomes and the effects of prisoner re-entry for ex-offenders.

Labor Market Prospects and Ex-offenders

Since the level of incarceration has increased massively, it may result in increasing the likelihood of certain groups being stereotyped as criminals. Freeman (1992) examined the relationship between incarceration and subsequent employment at the individual level. Using the National Longitudinal Survey of Youth (NLSY) data, he found that among African Americans, one-fifth of the 16 to 34 year old men and as many as three-fourths of the 25 to

34 year old high school dropouts had criminal records in the 1980s. These alarming rates created a sizable population of offenders and ex-offenders potentially outside the mainstream society. Freeman suggested that crime became a major determinant of the economic lives of a large proportion of disadvantaged African American men.

As a result of imprisonment being so commonplace among African American men, any taint resulting from imprisonment could substantially affect these men and the groups to which they belong (Lynch and Sabol 2000). Based upon current incarceration rates, the Bureau of Justice Statistics (BJS) estimates that 28% of African American males will be incarcerated at least once in their lifetime compared to 16% of Latino males and only 4% of white males. The BJS reports that the median time served for prisoners released during the late 1990s was less than two years (Bureau of Justice Statistics 1997). This information suggests that at any given point in time, the proportion of African Americans with past criminal convictions who have served time may be quite large.

Given that the labor market prospects of ex-offenders are likely to be influenced by whether employers have access to criminal records, individuals with past convictions may be excluded from or at least impeded in finding employment. Since the proportion of minority men who have served time is high, this form of exclusion may have adverse consequences on future employment opportunities for many individuals in this group.

In a situation where information about criminal history is limited, employers may infer the likelihood of past criminal activity from a master status, such as race. The stigmatization of race coupled with the inference about criminal activity in this manner, would negatively affect the employment outcomes of individuals with clean records that belong to this demographic group. Therefore, employers who do not run criminal background checks may eliminate African American and Latino applicants based on perceived criminality (Holzer, Raphael and Stoll 2002).

Holzer et al. 2002 analyzed the effect of employer-initiated criminal background

checks on the hiring of African Americans. They used establishment level data for four metropolitan areas to assess whether the race of the most recently hired employee is impacted by whether the employer investigates the criminal backgrounds of job applicants. They found that employers who check criminal backgrounds are *more* likely to hire African American male workers. This positive association remains even after controlling for an establishment's spatial proximity to African American residential areas and for the proportion of applications to the firms that come from African Americans. They indicate that the positive net effect suggests that the adverse consequence of employer-initiated background checks on the likelihood of hiring African Americans is more than offset by the positive effect of eliminating statistical discrimination.

In addition, Holzer et al. found this effect is stronger among those employers who report an aversion to hiring those with criminal records than among those who do not. They report that this pattern is consistent with the proposition that employers with a particularly strong aversion to ex-offenders may be more likely to over-estimate the relationship between criminality and race. Therefore, these employers may hire too few African Americans. In the absence of criminal background checks, employers may statistically discriminate against African American men and those with weak employment records. Holzer et al. estimates suggest that this type of statistical discrimination against African American men reduces the demand for their labor by at least 10-13%.

The findings from Holzer et al. (2002) suggest that the growing accessibility of criminal background records is leading employers to perform them in greater numbers. Due to the increases in incarceration rates of young African American men during the 1980s and 1990s, larger numbers of these men will be excluded from employment on the basis of these background checks in the future. They suggest that this form of discrimination may contribute to the observed employment and earnings gaps between young white and African American men.

As a result of limited labor market prospects, most prisoners fail to successfully transition to community life (Travis, Solomon and Waul 2001). The challenge of changing habits learned on the street and reinforced in the institution increases the difficulty associated with reintegration. Subsequently, prisoners are not primed for making the transition from the prison to the community. Due to the possibility of ties with family and friends being severed, the likelihood of finding work diminishes.

The likelihood of successful reintegration perhaps is even more of a challenge for minority prisoners. Since minority ex-offenders are more likely to return to the inner-city and employers are less likely to choose the inner-city as a business location (Tilly et al. 2001). This increases the difficulty of finding a job and limits the labor market opportunities of minority ex-offenders. In the next section, I discuss literature that addresses the effect of ex-offenders being concentrated in disadvantaged areas.

Spatial Concentration of Ex-offenders

As a consequence of the social and economic barriers produced by the residential segregation of African Americans, the inner-city has become home to a disproportionate concentration of the most disadvantaged segments of the urban African American population. The prevalence of incarceration is extremely problematic for African American men, especially African American men who do not complete high school. These men are much more likely to experience prison than other groups (Lynch and Sabol 2000). For released ex-offenders, the problem of reintegration becomes difficult within a spatial environment plagued by massive joblessness.

According to their analysis of BJS data, Lynch and Sabol (2000), report that cohorts of ex-offenders are concentrated in a few large states. In 1998, five states accounted for 265,000 released offenders. Within these states, ex-offenders are increasingly concentrated in core counties, which contain the central city of a metropolitan area.

Recent data from Ohio highlights the extreme concentration of offenders within neighborhoods. Bania, Coulton and Leete (2000) found that 20% of all offenders in Ohio prisons resided in Cuyahoga County before they were incarcerated. Of those who resided in the county, 75% lived in the central city-Cleveland before their incarceration. Using census block groups to define a neighborhood, 50 block groups out of 1,539 block groups accounted for one-fifth of all prisoners. Roughly 3% of Cuyahoga County's block groups accounted for about 20% of the state's prisoners. Out of the 50 block groups, 48 of these block groups were located in Cleveland. Bania et al. estimated that 350 to 700 offenders per year could be expected to return to the 48 block groups in Cleveland.

While many of the block groups are concentrated in the poorest Cleveland neighborhoods, some of the block groups are located near or in working class neighborhoods. This increased geographic concentration of ex-offenders within central city neighborhoods places the burden of reentry disproportionately on a small number of urban areas. If these urban areas have limited access to jobs, this enhances the possibility that involvement in illegitimate, income-producing activities will increase (Lynch and Sabol 2000).

The spatial concentration of incarceration can potentially compound the barriers to meaningful employment for ex-offenders and their peers. For example, Bania et al. (2000) found that in the Cleveland area, between 1975 and the mid-1990s, employment within the city of Cleveland grew by less than 2%, while employment in the suburbs grew by 121%. During this period, the percentage of manufacturing jobs (characterized by low-skill but high wage jobs) declined from 30% to 15% in the central city. Due to a large concentration of ex-offenders within the central city, a spatial mismatch between the residence of minority ex-offenders and the location of skill-appropriate jobs occurred within the city of Cleveland's racially segregated labor markets. I suspect that this type of spatial mismatch occurs more in cities characterized by high residential segregation.

Similarly, the volume and number of individuals moving into and out of prison can conceivably alter the conditions of supply and demand in local labor markets. When individuals from the community are incarcerated, the labor prospects of those who remain in the community improve (Western and Beckett 1999). However, when these released prisoners' return, they often join a large group of disadvantaged workers. Over time, the concentration of released prisoners on the local population could affect firms' location decisions and reduce labor demand (Western, Kling, Weinman 2001).

To examine the interrelationship of incarceration and labor force participation at the county level, Lynch and Sabol (1998) used the National Corrections reporting Program (NCRP) data to estimate prison admission rates and release rates for counties in 1983 and 1990. They hypothesize that men who experienced imprisonment will have less success in the job market upon release. Census data in 1980 and 1990 was used to estimate labor force participation and demographic characteristics of the counties for 1983 and 1990. They estimated a pooled time-series regression model that predicted participation in the labor force for the county, using releases from prison as well as economic and demographic variables. They estimated separate models for African Americans and whites, with the notion that higher rates of incarceration for African Americans were much more likely to affect labor force participation rates than the incarceration rates of whites. Offender release rates were negatively related to labor force participation for African Americans, but positively related to labor force participation for whites. The results suggest that incarceration negatively affects the social organization of African American communities but not white ones. In counties characterized by large numbers of African American men who experienced incarceration, the labor force participation of African American men is lower. Since whites are not limited in residence by racial segregation, Lynch and Sabol suggest that white released prisoners are more likely to move into high labor demand destinations upon release from prison.

The number of men incarcerated and the concentration of that incarceration in inner-city African American communities undermine social networks within these areas. Compared to other residents, African American ex-offenders are less likely to know someone who is employed within the legitimate labor market (Hagan 1993). Consequently, the return of ex-offenders to these communities only compounds the geographic concentration of joblessness. Ex-offenders are returning to communities that may be ill equipped to provide them with the support necessary for reintegration.

General Proposition: Higher racial residential segregation is likely to exacerbate the influence of imprisonment on the labor market disruption of minority ex-offenders. No such effect is expected for white ex-offenders.

7.4 Theoretical Model

The theoretical discussion presented thus far suggests that labor market characteristics influence the incarceration-earnings relationship. Figure 1 offers a visual representation of the relations that are examined, at their most general level. My intent is to specify ways in which spatial mechanisms explain the incarceration-earnings relationship and leads to differential labor market outcomes for race/ethnic groups.

According to the illustration below, I expect labor market processes to interact with incarceration and race/ethnicity in influencing earnings. Specifically, I argue that the four spatial level mechanisms have a direct impact on the way employers process job applicants. These four spatial mechanisms affect how employers evaluate the stigmas associated with incarceration and race/ethnicity as well as human capital accumulation and information generated through the activation of social capital, in terms of social networks (see Lin 2000). In this study, I am interested in the interaction of labor market attributes with race/ethnicity and prison status.

Although the argument has been made that labor market attributes influence the rate of crime and subsequent imprisonment (Crutchfield 1989; Crutchfield and Pitchford 1997), this relationship is not directly theorized in this study. Likewise, the direct association between labor market attributes and the average quality of jobs is not addressed within the context of the theoretical framework developed in this chapter. However, if these latter factors influence wages this would be obvious in estimating the direct effects of the labor market processes on wages.

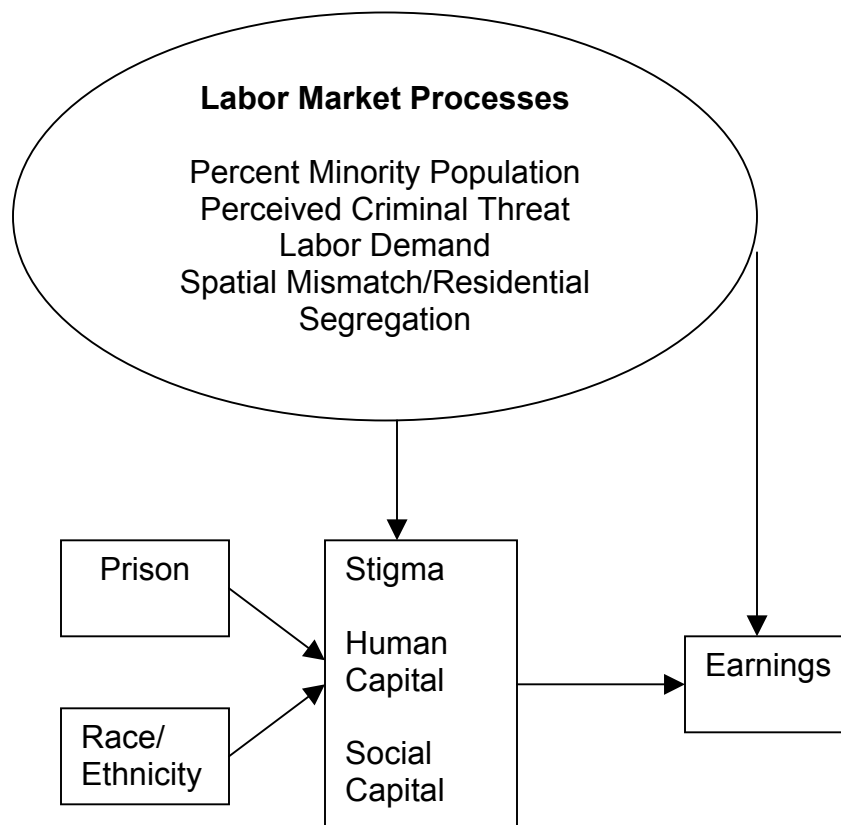


Figure 7.1. General Theoretical Model of the Interrelations between Labor Market Characteristics, Incarceration, Race/Ethnicity and Earnings

7.5 Data and Sample

The data for the spatial level analysis are drawn from the Restricted use file of the NLSY, the 1990 Summary Tape File 3 (STF3) of the Decennial Census and the 1990 Uniform Crime Reports (UCR). First, I merged the (STF3) file with the (UCR) file, to create a file that contained labor market characteristics measured at the MSA level. Then I merged the spatial file with the individual level data from the NLSY. This file contained individual level measures for the years 1979-1998 and spatial level measures for the year 1990. A key assumption surrounding the issue of merging the spatial file with the multiple observation individual level file is that MSA location on the spatial level indicators are relatively constant throughout the 18 year interval (i.e., the crime rate in 1990 is the similar to the relative crime rate in 1994). Basically, I assume that labor market characteristics associated with the 1990 MSAs are not subject to much variation over the time period. Since this is the first model that I am aware of to simultaneously use panel and spatial data, this approach seemed a prudent first step in developing such mixed models. In future research along these lines, I will try to build upon this mixed model strategy by incorporating time-varying spatial characteristics as well as time-varying individual level characteristics.

I used a one-to-many match merge³ procedure to assure that the 1990 (STF3) data would be assigned to the multiple observations within the person-period dataset. The sample for this analysis is based upon people residing in 395 MSAs and results in generating 36,946 person-years of data. Person year observations were dropped if they met the following conditions: (1) if the MSA code was coded as don't know and (2) if the individual did not reside in an MSA during a given year. Consequently, generalization of estimates is now restricted to urban populations.

³ A one-to-many match merge procedure is used when you are combining two data sets by matching one observation from one data set with more than one observation in another.

7.6 Spatial Level Variables

The spatial level variables included in this analysis are: the MSA codes, unemployment rate, violent crime rate, percent African American, percent Latino, African American/white residential dissimilarity and Latino/white residential dissimilarity measured at the MSA level. I describe each of these variables below.

The spatial unit of analysis of this data is the Metropolitan Statistical Area (MSA). An MSA is a geographic entity defined by the federal Office of Management and Budget for use by federal statistical agencies. MSA is based on the concept of a core urban area with a large population nucleus, plus adjacent communities having a high degree of economic and social integration with that core (US Census Bureau 1990)⁴. Although MSA definitions are partially based on commuting flows among counties, there is a limitation associated with selecting MSA as the unit of analysis. MSA as a unit of analysis is based upon a central place model. This model assumes that the geographic area has an urban center therefore rural areas are not included in the analysis. The elimination of rural areas means that MSA designations do not cover the entire geography of the U.S.

Some researchers who study labor market inequality have addressed this limitation by using 1990 journey-to-work data to produce another geographical category, the Labor Market Area (LMA) (Tolbert and Sizer 1997). Since LMAs do not have to contain an urban center, they can include both metropolitan and non-metropolitan areas. The drawback to using LMA as the unit of analysis is that prisoner re-entry research indicates most ex-offenders, especially minorities, return to urban areas which contain the central city upon

⁴ To be classified as an MSA requires the presence of a city with 50,000 or more inhabitants, or the presence of an Urbanized Area (UA) and a total population of at least 100,000 (75,000 in New England). Central counties of the MSA are the county or counties containing the largest city and surrounding densely settled territory. Additional outlying counties must qualify to be included in the MSA by meeting certain other criteria of metropolitan character, such as a specified minimum population density or percentage of the population that is urban. MSAs in New England are defined in terms of minor civil divisions, following rules concerning commuting and population density (U.S. Census 2000).

their release from prison (Bain, Coulton and Leete 2000; Lynch and Sabol 2000). By definition, MSAs include central cities. This inclusion of central city designations allows me to potentially investigate issues surrounding the concentration of ex-offenders. Therefore, I suspect selecting MSA as the unit of analysis comes with a minimal cost. Also, residential segregation is undefined for rural areas, so for many reasons MSA is the better spatial unit.

According to the Bureau of Labor Statistics (BLS), unemployed persons are defined as all persons who had no employment during the reference week and were actively seeking work. These people were available for work, except for temporary illness, and had made specific efforts to find employment sometime during the 4-week period ending with the reference week. Persons who were waiting to be recalled to a job from which they had been laid off need not have been looking for work to be classified as unemployed (Bureau of Labor Statistics 2002). It follows that the unemployment rate for the MSA as defined by the U.S. Census represents the number of unemployed persons as a percent of the civilian non-institutional labor force⁵.

The violent crime rate is composed of violent offenses and is used to gauge fluctuations in the volume and rate of crime reported to law enforcement officials. Violent crime is composed of 4 offenses: murder and non-negligent manslaughter, forcible rape, robbery, and aggravated assault. These offenses all involve force or threat of force. The violent crime rate is calculated by adding the total number of offenses reported for each crime divided by the total local population and multiplied by 100,000 (Crime in the United States 2000).

Percent African American is defined as the proportion of the population that is African American in the MSA. Percent Latino is defined as the proportion of the population that is Latino in the MSA.

⁵ According to the Bureau of Labor Statistics definition, a person who is currently incarcerated cannot be counted as an unemployed person, because they are considered part of the institutionalized population.

The Index of Dissimilarity is a measure of residential evenness, which captures the degree to which minority groups and whites are evenly spread among neighborhoods in a city. Evenness is defined with respect to the racial/ethnic composition of the city as a whole. The index of dissimilarity gives the percentage of minorities who would have to move to achieve an “even” residential pattern-one where every neighborhood replicates the racial/ethnic composition of the city (Massey and Denton 1993:20). This index is calculated for Africans and Latinos.

7.7 Hypotheses

I conceptualize the earnings process for jobseekers to be influenced by differences in spatial characteristics within and between labor markets. As a result of variation in labor markets, the ability to secure employment or high wages may become more problematic for both ex-offenders and non-offenders. The theory tested below is concerned with the effects on minorities and prisoners in particular. Thus, the hypotheses listed below predict spatial characteristics are expected to influence racial/ethnic and prison impacts on earnings.

H1: The costs of imprisonment are higher for ex-offenders in MSAs with high violent crime rates.

When the stigma of incarceration status is coupled with the stigma of violent crime urban areas, employers may be less likely to consider ex-offenders as viable employees. Given that employers may consider the criminal history of ex-offenders when making hiring decisions, finding a job becomes challenging. Therefore, ex-offenders will tend to have increasingly lower wages than non-offenders in high violent crime MSAs.

H2: The cost of being a minority is higher in MSAs with high violent crime rates.

I predict that the process of linking minority status and criminal threat in high crime environments generates stereotypes, which may influence employers' hiring decisions. Since minorities tend to live in areas that are more likely to be perceived as crime-ridden, employers may entangle the stigma of race and perceived criminality. Consequently, employers may label minorities from these areas as "honorary criminals". This label may translate into more unemployment and lower wages across the career. Employers in high crime cities may be more likely to view minority applicants as less productive workers, due to a lack of human capital or a more suspect set of social capital ties. I suspect that in cities with high violent crime rates, minorities may not be afforded opportunities to accumulate skills that may make them viable employees. As a result, minorities may be increasingly concentrated in low skilled, low paying jobs.

H3: The costs of imprisonment are higher for ex-offenders in MSAs with high unemployment rates.

Since ex-offenders tend to be low skilled and less-educated workers, employers may be more likely to view ex-offenders as a "bad risk" for employment. In labor markets with high unemployment rates, employers may find it easier to exercise a "taste for discrimination" that is based on criminal background. Therefore, employers may invoke higher employment standards, which decrease the likelihood of ex-offenders being hired.

H4: The cost of being a minority is higher in MSAs with high unemployment rates.

Declining labor-market opportunities have led to higher unemployment rates among minority men living in metropolitan areas. The shift in labor demand results in minority

workers competing for a scarce number of low skilled and low wage jobs. Consequently, the minority workers tend to have accumulated less human capital and skills that make them desirable to employers. Therefore, minority workers are more likely to be affected by a labor market with high unemployment rates. The same reasoning as above for ex-offenders suggests that it is easier for employers to exercise a taste for discrimination in high unemployment labor markets.

H5: As the percent minority in the MSA increases, ex-offender wages are lower than non-offender wages.

Wilcox and Roof (1978) found that traditional race stereotypes and norms intensify fears and threats, to the extent that minority visibility often provokes discriminatory responses. I suspect that in MSAs with a large minority population the negative perceptions associated with race/ethnicity will result in employers being less likely to hire ex-offenders. Since the majority of ex-offenders that are released from prison tend to be minorities (Lynch and Sabol 2001), then the stereotype of being a member of a group that is considered an economic threat coupled with incarceration status may make employers reluctant to hire ex-offenders.

H6: As the percent minority in the MSA increases, minority wages are lower than white wages.

In areas characterized with large minority populations, African American-white and Latino-white income inequality increases (Blalock 1956; Frisbie and Neidert 1977; Kiecolt 1989). Employers may have negative perceptions of communities with large minority populations. As a way to curtail the competition for economic resources, employers may engage in discriminatory practices that result in them refusing to hire minority workers.

Consequently, minority workers are predicted to have lower wage trajectories than white workers.

H7: The costs of imprisonment are higher for minority ex-offenders in MSAs with high levels of residential segregation.

Due to the economic and social barriers associated with residential segregation, ex-offenders, who tend to be minority group members, are spatially concentrated in segregated neighborhoods. These neighborhoods may lack persons who have access to information about employment. As a consequence of spatial concentration and the lack of social capital, minority ex-offenders may find it difficult to secure employment within the community.

H8: In MSAs with high residential segregation, minority wages are lower.

Residential segregation concentrates poverty in racially isolated neighborhoods. When an economic dislocation, such as a plant closing occurs, a large segment of the population is displaced from employment. Therefore workers from the racially isolated group enter a two-tier service economy that has numerous jobs. These jobs are typically low paying and low skilled positions; however, a few positions that require little education or skill are high paying jobs (Massey and Denton 1993). Overall, residential segregation contributes to increasing economic inequality. Likewise the wage gap between minority and white workers increases.

7.8 Random Effects Models

In Chapters 4 through 6, I used fixed-effects models to analyze individual longitudinal data with continuous outcome variables. However, I do not use a fixed effects approach in

the spatial level analysis. Since the spatial data is only collected for 1990 it does not vary across time and so a fixed effects model is not possible. Although both fixed and random effects models help reduce error variance in grouped data, according to Hsiao, a random effects model is preferable when you have a sample from a population (2001:389). The NLSY clearly represents a sample of residents from each observed MSA. For the individual level models emphasized in earlier chapters, I had a complete career history rather than a sample, strengthening the appropriateness of the fixed effects model.

A key assumption of random effects models is that α is uncorrelated with the predictor variables that change over time. Also α is uncorrelated with the error term (Allison 1994:179). In this study, α represents unobserved differences across MSAs that are constant over time. Thus, this model assumes that things considered stable causes are random within MSA effects. For each MSA, this approach controls for variation attributable to each unique characteristic of the MSA by fitting a random error term for each MSA. This requires multiple observations within each MSA.

One advantage of moving from a fixed effects model to a random effects model is that I can now estimate coefficients for time invariant variables (stable individual characteristics or MSA characteristics) within the model. This is due to the assumption that stable individual variables such as race and cognitive skill and the time varying individual and MSA variables in the model are not correlated with α , the unobserved differences across MSAs. A fixed effects model essentially introduces a dummy variable for the grouping variable (Person ID in the previous chapters). When you are examining within person variation, the fixed effect is always perfectly correlated with any other time invariant traits such as race for each individual that is tracked in the dataset. There is simply no unique information. Thus, a fixed effects model captures nearly perfectly, the part of the error term associated with stable group individual traits but sacrifices the ability to estimate the direct consequences of theoretically interesting fixed traits such as race. However, there

is a trade-off between bias and efficiency when determining whether to use fixed versus random effects. The fixed effects approach is effective at reducing bias due to omitted explanatory variables but this occurs at the cost of possibly increasing the standard error substantively. The random effects approach reduces the standard error but is subject to bias if the standard regression assumption that the error term is uncorrelated with observed variables is violated (Allison 1997).

Thus these random effects models have two advantages and one disadvantage relative to the fixed effects models presented in earlier chapters. The effect of time invariant traits can be estimated within the spatial models developed in this chapter. Some person level heterogeneity that is fixed but unmeasured is controlled in the fixed effects model, but remains uncontrolled in these models. This uncontrolled person level heterogeneity will only influence the estimates of spatial characteristics if these fixed unmeasured individual traits are correlated with the measured spatial characteristics. At this point, I do not have theoretical reasons to suspect such correlations might exist. For these correlations to exist there would need to be stable cultural differences between places that are associated with structural indicators. Such factors may exist and future research should explore a mixture of random effects spatial models and fixed effects individual ones. Given these limitations these models are clear improvements over previous spatial models by incorporating career processes. They are also clear improvements over fixed effects human capital models by incorporating spatial processes into the explanation of wage variation. They are also the first models to look at the influence of prison on wages for individuals who live in a particular spatial context.

My modeling strategy examines the impact of each spatial effect individually to see how each particular labor market characteristic shape ex-offender earnings. First, I will generate estimates for each spatial effect separately. After estimating separate spatial level

models, I will estimate a model that includes all four spatial level variables and the pertinent interaction variables simultaneously.

7.9 Random Effects Model Estimates

The literature concerning racial and ethnic disparities in labor market opportunities suggests that labor market characteristics are shaped to some extent by geographic location. Geographic variation in local labor markets may impact the degree to which incarceration influences individual earnings for ex-offenders. To investigate this issue, I examine how labor market characteristics influence the relationship between incarceration and earnings with statistical controls for random-effects and age related exogenous effects such as education and marriage. By controlling for these factors, I can see if labor market characteristics influence the career trajectories of ex-offenders and minorities.

An assumption concerning the random effects model is that α is uncorrelated with the X s. Under the assumption of no correlated error, OLS and GLS estimates of the effects of the measured covariates should not differ systematically. However, the resulting estimates of β for a random effects model are more efficient than the estimates of the standard error from a simple OLS regression that do not control for the possibility of city specific error terms (Hausman 1978; Teachman, Duncan, Yeung and Levy 2001). Therefore in the tables discussed below, I present both full OLS and random effects models consisting of the respective structural covariates and structural by individual level covariate interaction terms. When OLS and random effects coefficients are similar, we can be fairly confident that the inference based on the random effects model is strong. When the OLS and the random effects models are substantially different, there is an increased threat that the estimates are biased and a more cautious interpretation is reasonable.

There are additional variables included in the random effects models explored in this chapter. In addition to the human capital variables, these models include spatial level variables and a set of two-way interaction variables: (spatial level characteristics by incarceration) and (spatial level characteristics by race/ethnicity).

Due to the structure of random effects models, I am able to generate race-specific slopes. Therefore to better understand the impact of spatial characteristics on earnings, I am focusing on examining the total effects of prison and race/ethnicity rather than age-prison and age-race/ethnicity trajectories. In this case, I suspect that the trade off concerning the estimation of random effects models instead of fixed effects models is minimal. It is hard to imagine that the individual error term is strongly correlated with city characteristics. However, this assumption can be tested in future research if MSA values are allowed to vary over time. I will use comparisons to OLS estimates to reduce the chance of making a false inference.

Spatial Characteristic: Violent Crime Rate

The random effects model for examining the influence of violent crime rates on hourly wages is listed below:

$$\begin{aligned} \text{Wages}(\ln)_{it} = & \alpha_t + \beta_1 \text{Age}_{it} + \beta_2 \text{Black}_{it} + \beta_3 \text{Latino}_{it} + \beta_4 \text{Jail}_{it} + \beta_5 \text{Prior Jail}_{it} + \beta_6 \\ & \text{Education}_{it} + \beta_7 \text{Age*Education}_{it} + \beta_8 \text{Black*Prior Jail}_{it} + \beta_9 \text{Latino*Prior Jail}_{it} + \beta_{10} \\ & \text{Violent Crime Rate}_{it} + \beta_{11} \text{Violent Crime Rate*Prior Jail}_{it} + \beta_{12} \text{Violent Crime} \\ & \text{Rate*Black}_{it} + \beta_{13} \text{Violent Crime Rate*Latino}_{it} + \beta_{14} \text{Violent Crime} \\ & \text{Rate*Black*Prior Jail}_{it} + \beta_{15} \text{Violent Crime Rate*Latino*Prior Jail}_{it} + \beta_{16} \text{Control}_{it} + Z + \\ & \epsilon_{it} \end{aligned}$$

where

$Wages(\ln)_{it}$	=	The natural log of hourly wages in time t
α_t	=	The unobserved differences across MSAs that are constant over time
Z	=	The random error term for MSAs
Age_{it}	=	Respondent's age in time t
$Jail_{it}$	=	Current Incarceration in time t
$Prior\ Jail_{it}$	=	Prior Incarceration in time t
$Education_{it}$	=	Years of education in time t
$Black_{it}$	=	Dummy variable for Blacks in time t
$Latino_{it}$	=	Dummy variable for Latinos in time t
$Age\ Prior\ Jail_{it}$	=	Product term for age and prior incarceration in time t
$Age*Black_{it}$	=	Product term for age and Blacks in time t
$Age*Latino_{it}$	=	Product term for age and Latinos in time t
$Age*Black*Prior\ Jail_{it}$	=	Product term for age, Blacks and prior incarceration and in time t
$Age*Latino*Prior\ Jail_{it}$	=	Product term for age, Latinos and prior incarceration and in time t
$Violent\ Crime\ Rate_{it}$	=	MSA violent crime rate in time t
$Violent\ Crime*Prior\ Jail_{it}$	=	Product term for MSA violent crime rate and prior incarceration in time t
$Violent\ Crime*Black_{it}$	=	Product term for MSA violent crime rate and Blacks in time t
$Violent\ Crime*Latino_{it}$	=	Product term for MSA violent crime rate and Latino in time t
$Violent\ Crime*Black*Prior\ Jail_{it}$	=	Product term for MSA violent crime rate Blacks and prior incarceration
$Violent\ Crime*Latino*Prior\ Jail_{it}$	=	Product term for MSA violent crime rate Latinos and prior incarceration
$Control_{it}$	=	Control variables in time t

ε_{it} = The disturbance term in time t

Table 7.1 reports an Ordinary Least Squares (OLS) model and a random-effects model concerning the influence of the violent crime rate on hourly wage. I also estimated models using the total crime rate. The results of the total crime models are similarly to the violent crime models. However the estimates for the violent crime models were stronger, suggesting that violent crime is a more powerful source of criminal threat than crime in general. In the random effects model, the most important finding is that the relationship between hourly wage and the violent crime rate is conditioned by race/ethnicity but not by prison experience. The estimate for the violent crime by black interaction is negative and statistically significant. Thus, African Americans incur a higher wage penalty when they live in cities with high violent crime rates. In the MSA with the highest violent crime rate, African Americans experience a 7% ($2298.3 * -0.00003 * 100$) decrease in hourly wages relative to whites. In the MSA with the lowest crime rate, African Americans experience a decrease in hourly wages of 0.25% relative to whites. The parameter estimates from the OLS models are similar to the random effects parameter estimates. This suggests that the estimates are unlikely to be biased by some correlation between α and the measured variables. Controlling for the random error terms also functions as a control for unmeasured processes that may exist within metropolitan areas. The random effects model does find support for *Hypothesis 2: the costs of imprisonment are higher for minorities in MSAs with high violent crime rates*. This suggests that the violent crime rate of an MSA affects the labor market opportunities of African Americans who reside in these high crime areas.

Table 7.1. OLS and Random Effects Models of Log Hourly Wage on Violent Crime Measures and Selected Variables for NLSY Men, 1979-1998.

	OLS Model	Random Effects Model
Prior Incarceration	-0.145** (9.59)	0.057*** (2.18)
Black	-0.073*** (11.90)	-0.079*** (11.99)
Latino	-0.053*** (8.04)	-0.038** (4.79)
Prior Incarceration *Black	0.026 (0.91)	0.012 (0.43)
Prior Incarceration*Latino	-0.012 (0.36)	0.0004 (0.01)
Violent Crime Rate	0.00010*** (23.20)	0.000062*** (2.34)
Violent Crime*Prior Incarceration	-0.000008 (0.34)	-0.000002 (0.09)
Violent Crime*Black	-0.000020* (1.77)	-0.00003*** (2.86)
Violent Crime*Latino	0.000036** (3.04)	-0.00001 (1.07)
Intercept	1.86	1.83
R ²	0.3184	
-2 Log Likelihood		41512.5

Person Years = 36,946. Absolute value of t statistic in parentheses

*p<.05 **p<.01 ***p<.001 (one-tailed tests)
⁺p<.05 ⁺⁺p<.01 ⁺⁺⁺p<.001 (two-tailed tests)

Note: These estimates are based upon variables centered around the grand mean. The coefficients are unstandardized. Table 7.1 presents results for variables of substantive interest only. All models include the following control variables: hours worked per week, marital status, living in the suburbs, central city, current school enrollment, current incarceration, age, education, and cognitive skill. The control variable results are presented in the Appendix, Table A.5.

Spatial Characteristic: Unemployment Rate

The random effects model for examining the influence of unemployment rates on hourly wages is listed below:

$$\begin{aligned} \text{Wages}(\ln)_{it} = & \alpha_t + \beta_1 \text{Age}_{it} + \beta_2 \text{Black}_{it} + \beta_3 \text{Latino}_{it} + \beta_4 \text{Jail}_{it} + \beta_5 \text{Prior Jail}_{it} + \beta_6 \\ & \text{Education}_{it} + \beta_7 \text{Age} * \text{Education}_{it} + \beta_8 \text{Black} * \text{Prior Jail}_{it} + \beta_9 \text{Latino} * \text{Prior Jail}_{it} + \beta_{10} \\ & \text{Unemployment Rate}_{it} + \beta_{11} \text{Unemployment Rate} * \text{Prior Jail}_{it} + \beta_{12} \text{Unemployment} \\ & \text{Rate} * \text{Black}_{it} + \beta_{13} \text{Unemployment Rate} * \text{Latino}_{it} + \beta_{14} \text{Unemployment} \\ & \text{Rate} * \text{Black} * \text{Prior Jail}_{it} + \beta_{15} \text{Unemployment Rate} * \text{Latino} * \text{Prior Jail}_{it} + \beta_{16} \text{Control}_{it} \\ & + Z + \epsilon_{it} \end{aligned}$$

where

α_t	=	The unobserved differences across MSAs that are constant over time
Z	=	The random error term for MSAs
Age_{it}	=	Respondent's age in time t
Jail_{it}	=	Current Incarceration in time t
Prior Jail_{it}	=	Prior Incarceration in time t
Education_{it}	=	Years of education in time t
Black_{it}	=	Dummy variable for Blacks in time t
Latino_{it}	=	Dummy variable for Latinos in time t
$\text{Age Prior Jail}_{it}$	=	Product term for age and prior incarceration in time t
$\text{Age} * \text{Black}_{it}$	=	Product term for age and Blacks in time t
$\text{Age} * \text{Latino}_{it}$	=	Product term for age and Latinos in time t
$\text{Age} * \text{Black} * \text{Prior Jail}_{it}$	=	Product term for age, Blacks and prior incarceration and in time t
$\text{Age} * \text{Latino} * \text{Prior Jail}_{it}$	=	Product term for age, Latinos and prior incarceration and in time t

Unemployment Rate _{it}	=	Unemployment rate in the MSA in time t
Unemployment Rate*Prior Jail _{it}	=	Product term for MSA unemployment rate and prior incarceration in time t
Unemployment Rate* Black _{it}	=	Product term for MSA unemployment rate and Blacks
Unemployment Rate*Latino _{it}	=	Product term for MSA unemployment rate and Latinos
Unemployment Rate*Prior Jail*Black _{it}	=	Product term for MSA unemployment rate Blacks and prior incarceration
Unemployment Rate*Prior Jail*Latino _{it}	=	Product term for MSA unemployment rate Latinos and prior incarceration

Table 7.2 displays results concerning the influence of the MSA unemployment rate on hourly wages. In the random effects model, one key interaction is statistically significant. The interaction of unemployment rate by Latino suggests that the relationship between hourly wage and the unemployment rate of the MSA is conditioned by race/ethnicity. For Latino men, living in an MSA with a high unemployment rate results in these men experiencing a wage penalty. Latino men who live in the MSA with the highest unemployment rate in the sample, experience a 53% ($14.32^* - 0.037^*100$) decrease in hourly wage relative to whites. Latino men who live in the MSA with the lowest unemployment rate experience an 11% ($2.87^* - 0.037^*100$) decrease in hourly wages relative to whites. This result supports *Hypothesis 3: the cost of being a minority is higher in MSAs with high unemployment rates*.

The results from the OLS and the random effects models indicate that living in cities with high unemployment influences the hourly wages of Latinos. The results for African Americans are quite different. In the random effects model, parameter estimates for the African American interaction variables are not significant. This may suggest that in cities with high unemployment rates, employers may engage in racial bias that is a function of

viewing African Americans as threatening. The perceived threat associated with African Americans may result in lower employment rates. Perhaps this is an indication that the model has omitted other variables important to the job search process for African Americans.

Table 7.2. OLS and Random Effects Models of Log Hourly Wage on Unemployment Measures and Selected Variables for NLSY Men, 1979-1998.

	OLS Model	Random Effects Model
Prior Incarceration	-0.148*** (2.59)	-0.141*** (9.27)
Black	-0.058*** (9.51)	-0.080*** (12.32)
Latino	0.040*** (5.99)	-0.026*** (3.33)
Prior Incarceration* Black	0.038 (1.36)	0.018 (0.65)
Prior Incarceration*Latino	-0.003 (0.09)	0.025 (0.67)
Unemployment Rate	-0.007*** (4.60)	-0.005 (0.90)
Unemployment Rate*Prior Incarceration	0.013 (1.67)	0.022 (2.91)
Unemployment Rate*Black	-0.002 (0.73)	0.002 (0.52)
Unemployment Rate*Latino	-0.053*** (16.95)	-0.037*** (7.45)
R ²	0.3151	
Intercept	1.87	1.82
-2 Log Likelihood		41410.0

Person Years = 36,946. Absolute value of t statistic in parentheses

Note: These estimates are based upon variables centered around the grand mean. The estimates are unstandardized. Table 7.2 presents results for variables of substantive interest only. All models include the following control variables: hours worked per week, marital status, living in the suburbs, central city, current school enrollment, current incarceration, age, education, and cognitive skill. The control variable results are presented in the Appendix, Table A.6.

*p<.05 **p<.01 ***p<.001 (one-tailed tests)
 +p<.05 ++p<.01 +++p<.001 (two-tailed tests)

Spatial Characteristic: Minority Concentration

The random effects model for examining the influence of minority concentration on hourly wages is listed below:

$$\begin{aligned} \text{Wages}(\ln)_{it} = & \alpha_t + \beta_1 \text{Age}_{it} + \beta_2 \text{Black}_{it} + \beta_3 \text{Latino}_{it} + \beta_4 \text{Jail}_{it} + \beta_5 \text{Prior Jail}_{it} + \beta_6 \\ & \text{Education}_{it} + \beta_7 \text{Age} * \text{Education}_{it} + \beta_8 \text{Black} * \text{Prior Jail}_{it} + \beta_9 \text{Latino} * \text{Prior Jail}_{it} + \beta_{10} \\ & \text{Percent Minority}_{it} + \beta_{11} \text{Percent Minority} * \text{Prior Jail}_{it} + \beta_{12} \text{Percent Minority} \\ & * \text{Minority}_{it} + \beta_{13} \text{Percent Minority} * \text{Minority} * \text{Prior Jail}_{it} + \beta_{14} \text{Control}_{it} + Z + \varepsilon_{it} \end{aligned}$$

where

α_t	=	The unobserved differences across MSAs that are constant over time
Z	=	The random error term for MSAs
Age_{it}	=	Respondent's age in time t
Jail_{it}	=	Current Incarceration in time t
Prior Jail_{it}	=	Prior Incarceration in time t
Education_{it}	=	Years of education in time t
Black_{it}	=	Dummy variable for Blacks in time t
Latino_{it}	=	Dummy variable for Latinos in time t
$\text{Age Prior Jail}_{it}$	=	Product term for age and prior incarceration in time t
$\text{Age} * \text{Black}_{it}$	=	Product term for age and Blacks in time t
$\text{Age} * \text{Latino}_{it}$	=	Product term for age and Latinos in time t
$\text{Age} * \text{Black} * \text{Prior Jail}_{it}$	=	Product term for age, Blacks and prior incarceration and in time t
$\text{Age} * \text{Latino} * \text{Prior Jail}_{it}$	=	Product term for age, Latinos and prior incarceration and in time t
$\text{Percent Black}_{it}$	=	Percent Black residing in the MSA in time t
$\text{Percent Latino}_{it}$	=	Percent Latino residing in the MSA in time t

Percent Black*Prior Jail _{it}	=	Product term for percent Black residing in the MSA and prior incarceration in time t
Percent Latino*Prior Jail _{it}	=	Product term for percent Latino residing in the MSA and prior incarceration in time t
Percent Black*Black _{it}	=	Product term for percent African American residing in the MSA and individual level term for Blacks in time t
Percent Latino*Latino _{it}	=	Product term for percent Latino residing in the MSA and individual level term for Latinos in time t
Percent Black*Black*Prior Jail _{it}	=	Product term for percent African American residing in the MSA, individual level term for Blacks and prior incarceration in time t
Percent Latino*Latino *Prior Jail _{it}	=	Product term for percent Latino residing in the MSA, individual level term for Latinos and prior incarceration in time t

Using the same equations presented in Tables 7.3 and 7.4, I derived separate models for African Americans and Latinos.

African American Concentration

Table 7.3 presents the results concerning the relationship between hourly wages and African American concentration. The second model is estimated with random effects at the MSA level. This model indicates that the relationship between hourly wage and percent black is positive and statistically significant. This suggests that whites receive an additional 0.20% increase in hourly wages for each additional 1% increase in the proportion of African Americans. In this model the interaction term percent Black by Black (at the individual level) is negative and statistically significant. In MSAs with a large African American population, African American hourly earnings decrease by an additional 0.02% relative to whites for each 1% increase in the proportion of African Americans.

The OLS and the random effects results support *Hypothesis 6: As the percent minority in the MSA increases, minority wages are lower than white wages*. This suggests that African Americans incur a wage penalty when they live in cities with a large proportion of the population that is African American. On the other hand, whites who live in cities with a large African American population experience an increase in hourly wages. Therefore, the results suggest that minority concentration contributes to racial disparities in earnings.

The results from the OLS and the random effects models indicate that there is not a relationship between minority concentration and the effect of incarceration status. Thus the results do not support *Hypothesis 5: As the percent minority in the MSA increases, ex-offender wages are lower than non-offender wages*. For these models, the results indicate that in cities with a large minority population, employers may view the proportion of African Americans negatively. Therefore employers may be increasingly reluctant to hire African Americans into higher wage jobs.

Table 7.3. OLS and Random Effects Models of Log Hourly Wage on African American Population Measures and Selected Variables for NLSY Men, 1979-1998.

	OLS Model	Random Effects Model
Prior Incarceration	-0.144 *** (2.43)	-0.015*** (9.42)
Black	-0.001*** (5.14)	-0.074*** (10.77)
Prior Incarceration *Black	0.005 (0.18)	-0.008 (0.29)
Percent Black	0.0014*** (5.14)	0.0020** (1.94)
Percent Black*Prior Incarceration	0.002 (1.97)	-0.00013 (0.08)
Percent Black *Black ^a	-0.005*** (9.79)	-0.002** (3.13)
Intercept	1.87	1.82
R ²	0.3095	
-2 Log Likelihood		41472.0

^a This variable represents the race coefficient for African Americans at the individual level.
Person Years = 36,946. Absolute value of t statistic in parentheses

Note: These estimates are based upon variables centered around the grand mean. The estimates are unstandardized. Table 7.3 presents results for variables of substantive interest only. All models include the following control variables: hours worked per week, marital status, living in the suburbs, central city, current school enrollment, current incarceration, age, education, and cognitive skill. The control variable results are presented in the Appendix, Table A.7.

*p<.05 **p<.01 ***p<.001 (one-tailed tests)
⁺p<.05 ⁺⁺p<.01 ⁺⁺⁺p<.001 (two-tailed tests)

Latino Concentration

Table 7.4 presents the results concerning the relationship between hourly wages and Latino concentration. In the random effects model, the interaction between percent Latino and Latino is negative and statistically significant. This indicates that Latinos living in cities with a large Latino population experience a 0.16% decrease in hourly wages relative to whites for each additional 1% increase in the proportion of Latinos.

The results from the OLS and random effects models support *Hypothesis 6: As the percent minority in the MSA increases, minority wages are lower than white wages.* Therefore, the results find support for a race effect concerning the relationship between minority concentration and hourly wages. Latinos who live in cities with a large Latino population experience a wage penalty. However, the results do not support *Hypothesis 5: As the percent minority in the MSA increases, ex-offender wages are lower than non-offender wages.* In contrast, the interaction between percent Latino by prior incarceration was positive and significant. This finding suggests that ex-offenders who live in cities with a large Latino population do not incur a wage penalty.

Table 7.4. OLS and Random Effects Models of Log Hourly Wage on Latino Population Measures and Selected Variables for NLSY Men, 1979-1998.

	OLS Model	Random Effects Model
Prior Incarceration	-0.148*** (9.79)	-0.141** (9.26)
Latino	0.034*** (4.43)	-0.026*** (3.01)
Prior Incarceration* Latino	-0.057 (1.38)	-0.041*** (1.00)
Percent Latino	0.004*** (12.61)	-0.0012 (1.10)
Percent Latino*Prior Incarceration	0.0039*** (2.60)	0.0039** (2.08)
Percent Latino*Latino ^a	-0.012*** (21.31)	-0.0016** (2.11)
Intercept	1.88	1.81
R ²	0.3162	
-2 Log Likelihood		41470.7

^aThis variable represents the race coefficient for Latinos at the individual level.
Person Years = 36,946. Absolute value of t statistic in parentheses

Note: These estimates are based upon variables centered around the grand mean. The estimates are unstandardized. Table 7.4 presents results for variables of substantive interest only. All models include the following control variables: hours worked per week, marital status, living in the suburbs, central city, current school enrollment, current incarceration, age, education, and cognitive skill. The control variable results are presented in the Appendix, Table A.8.

*p<.05 **p<.01 ***p<.001 (one-tailed tests)
⁺p<.05 ⁺⁺p<.01 ⁺⁺⁺p<.001 (two-tailed tests)

Spatial Characteristic: Residential Segregation

The random effects model for examining the influence of residential segregation on hourly wages is listed below:

$$\begin{aligned} \text{Wages}(\ln)_{it} = & \alpha_t + \beta_1 \text{Age}_{it} + \beta_2 \text{Black}_{it} + \beta_3 \text{Latino}_{it} + \beta_4 \text{Jail}_{it} + \beta_5 \text{Prior Jail}_{it} + \beta_6 \\ & \text{Education}_{it} + \beta_7 \text{Age} * \text{Education}_{it} + \beta_8 \text{Black} * \text{Prior Jail}_{it} + \beta_9 \text{Latino} * \text{Prior Jail}_{it} + \beta_{10} \\ & \text{Dissimilarity}_{it} + \beta_{11} \text{Dissimilarity} * \text{Prior Jail}_{it} + \beta_{12} \text{Dissimilarity} * \text{Minority}_{it} + \beta_{13} \\ & \text{Dissimilarity} * \text{Minority} * \text{Prior Jail}_{it} + \beta_{14} \text{Control}_{it} + z + \varepsilon_{it} \end{aligned}$$

where

α_t	=	The unobserved differences across MSAs that are constant over time
z	=	The random error term for MSAs
Age_{it}	=	Respondent's age in time t
Jail_{it}	=	Current Incarceration in time t
Prior Jail_{it}	=	Prior Incarceration in time t
Education_{it}	=	Years of education in time t
Black_{it}	=	Dummy variable for Blacks in time t
Latino_{it}	=	Dummy variable for Latinos in time t
$\text{Age Prior Jail}_{it}$	=	Product term for age and prior incarceration in time t
$\text{Age} * \text{Black}_{it}$	=	Product term for age and Blacks in time t
$\text{Age} * \text{Latino}_{it}$	=	Product term for age and Latinos in time t
$\text{Age} * \text{Black} * \text{Prior Jail}_{it}$	=	Product term for age, Blacks and prior incarceration and in time t
$\text{Age} * \text{Latino} * \text{Prior Jail}_{it}$	=	Product term for age, Latinos and prior incarceration and in time t
$\text{B/W Dissimilarity}_{it}$	=	Black/White Dissimilarity in time t
$\text{L/W Dissimilarity}_{it}$	=	Latino/White Dissimilarity in time t

B/W Dissimilarity*Prior Jail _{it}	=	Product term for Black/White Dissimilarity and prior jail in time t
L/W Dissimilarity*Prior Jail _{it}	=	Product term for Latino/White Dissimilarity and prior jail in time t
B/W Dissimilarity * Black _{it}	=	Product term for Black/White Dissimilarity and the individual level term for Blacks in time t
L/W Dissimilarity* Latino _{it}	=	Product term for Latino/White Dissimilarity and the individual level term for Latinos in time t
B/W Dissimilarity * Black* Prior Jail _{it} =		Product term for Black/White Dissimilarity, the individual level term for Blacks and prior incarceration in time t
L/W Dissimilarity* Latino* Prior Jail _{it} =		Product term for Latino/White Dissimilarity, the individual level term for Latinos and prior incarceration in time t

Two separate models, for African Americans and Latinos are derived from the general equation presented.

African American/White Residential Segregation

Table 7.5 presents the results for the impact of African American/White residential segregation on hourly wages. In the random effects model, ex-offenders earn 14.1% less per hour than non-offenders. African Americans earn 8% less per hour than whites. The interaction residential segregation by black is statistically significant. When compared to their white counterparts, African Americans living in highly segregated places experience a 5.1% decrease in their hourly wages. The cost of segregation for African Americans who live in Detroit results in a \$4.45 decrease in hourly wages (5.1*0.874). While the cost of segregation for those African Americans who live in an MSA with low segregation Jacksonville, NC their hourly wages decrease by \$1.15 (5.1*0.227).

The results from the OLS and random effects models provide support for *Hypothesis 7: In MSAs with high residential segregation, minority wages are lower.* If racial segregation

concentrates poverty in geographic space, then any type of economic dislocation that occurs within this space may result in a decrease in the income of African Americans. As a result, African Americans who tend to live in racially segregated communities are more likely to experience lower wages. However, the models do not support *Hypothesis 6: the costs of imprisonment are higher for minority ex-offenders in MSAs with high levels of residential segregation*. Therefore, ex-offenders who live in racially segregated communities may not incur a wage penalty. Employers may not consider incarceration status when making hiring decisions concerning ex-offenders who live in highly segregated communities.

Table 7.5. OLS and Random Effects Models of Log Hourly Wage on Black/White Residential Segregation Measures and Selected Variables for NLSY Men, 1979-1998.

	OLS Final Model	Random Effects Model
Prior Incarceration	-0.147*** (9.61)	-0.141** (9.23)
Black	-0.055*** (8.97)	-0.080*** (12.31)
Prior Incarceration*Black	0.035 (1.23)	0.014 (0.50)
Residential Segregation	0.005 (0.51)	-0.023 (0.51)
Residential Segregation*Prior Incarceration	-0.005 (0.08)	-0.007 (0.13)
Residential Segregation*Black ^a	-0.10*** (4.17)	-0.051* (2.00)
Residential Segregation*Black ^a *Prior Incarceration	0.14 (1.19)	0.20 (1.68)
Intercept	1.86	1.81
R ²	0.3077	
-2 Log Likelihood		41456.0

^aThis variable represents the race coefficient for African Americans at the individual level.
Person Years = 36,946. Absolute value of t statistic in parentheses

Note: These estimates are based upon variables centered around the grand mean. The estimates are unstandardized. Table 7.5 presents results for variables of substantive interest only. All models include the following control variables: hours worked per week, marital status, living in the suburbs, central city, current school enrollment, current incarceration, age, education, and cognitive skill. The control variable results are presented in the Appendix, Table A.9.

*p<.05 **p<.01 ***p<.001 (one-tailed tests)
⁺p<.05 ⁺⁺p<.01 ⁺⁺⁺p<.001 (two-tailed tests)

Latino/White Residential Segregation

Table 7.6 displays the results of the effect of Latino/White residential segregation on hourly wages. The estimates of prior incarceration and Latino in the random effects full model are similar to the OLS estimates. The OLS model shows that ex-offenders earn 14% less per hour relative to non-offenders. Latino hourly wages are 2.7% less than whites. However, the substantive interpretation of the interaction of residential segregation by Latino is different. In the random effects model the estimate is negative and statistically significant. This indicates that in areas characterized by high levels of segregation, Latinos actually experience a decrease in hourly wages relative to whites. Thus, Latinos concentrated in ethnic enclaves incur a wage penalty due to living in areas where the Latino population is heavily concentrated.

The OLS model estimates do not provide support for *Hypothesis 7: In MSAs with high residential segregation, minority wages are lower*. In fact the coefficients for these values are the opposite sign of the predicted direction. The OLS model suggests that men living in cities with high levels of residential segregation actually experience a wage increase. In addition, the interaction term, residential segregation by Latino suggests that in ethnic segregated communities, Latinos receive an additional wage increase. The contradictory results between the OLS and random effects models suggest omitted variable bias. Therefore, the results of these models suggest that the process concerning the impact of residential segregation for Latinos is characterized by more complexity than currently modeled. Thus while the hypotheses was supported in the random effects model it must be treated as more suspect than significant effects in earlier models.

The three way interactions between residential segregation by race/ethnicity by prior incarceration were not statistically significant in these models. These interactions tested *hypothesis 6: the costs of imprisonment are higher for minority ex-offenders in MSAs with higher levels of residential segregation*. This hypothesis was derived from the theoretical

discussion concerning the spatial concentration of minority ex-offenders. Therefore the key prediction that the spatial concentration of ex-offenders in segregated minority neighborhoods was not supported for either Latinos or African Americans.

Table 7.6. OLS and Random Effects Models of Log Hourly Wage on Latino/White Residential Segregation Measures and Selected Variables for NLSY Men, 1979-1998.

	OLS Model	Random Effects Model
Prior Incarceration	-0.139*** (9.14)	-0.143** (9.37)
Latino	-0.054*** (7.73)	-0.027*** (3.27)
Prior Incarceration*Latino	-0.010 (0.28)	0.014 (0.40)
Residential Segregation	0.41*** (23.31)	0.09 (0.94)
Residential Segregation*Prior Incarceration	-0.026 (0.29)	-0.11 (1.29)
Residential Segregation*Latino ^a	0.150 ⁺⁺⁺ (2.96)	-0.143*** (2.50)
Residential Segregation*Latino ^a *Prior Incarceration	-0.43 (0.12)	-0.38 (1.31)
R ²	0.3174	
Intercept	1.85	1.82
-2 Log Likelihood		41446.4

^a This variable represents the race coefficient for Latinos at the individual level.
Person Years = 36,946. Absolute value of t statistic in parentheses

Note: These estimates are based upon variables centered around the grand mean. The estimates are unstandardized. Table 7.6 presents results for variables of substantive interest only. All models include the following control variables: hours worked per week, marital status, living in the suburbs, central city, current school enrollment, current incarceration, age, education, and cognitive skill. The control variable results are presented in the Appendix, Table A.10.

*p<.05 **p<.01 ***p<.001 (one-tailed tests)
⁺p<.05 ⁺⁺p<.01 ⁺⁺⁺p<.001 (two-tailed tests)

7.10 Modeling Spatial Characteristics

Based upon the four individual spatial characteristic models, I estimated four models which included all of the main spatial level effects and interaction terms. To check for multicollinearity, I ran each of these models in OLS and examined the variance inflation factor for each variable. In the first model, the terms percent Latino and the interaction term percent Latino by Latino had variance inflation factors greater than 4, which indicates that these variables are highly correlated with each other as well as other variables in the model. Therefore, I ran a model, which deleted the percent Latino term to see how it affected the variance inflation factor of the other variables in the model. Once this term was deleted, the variance inflation factor of the percent Latino by Latino interaction term remained at 4. This indicates that this term is still highly correlated with the other variables in the model.

To solve this problem, I turned to the theoretical discussion to determine which variables should be highly correlated with minority concentration. Based upon the spatial level mechanisms, the theories associated with minority concentration and residential segregation are closely related. Therefore, I decided to run models in which I separated the residential segregation and the minority concentration measures. After running two separate models, the variance inflation factors for every variable in these models ranged between 1 and 2. Therefore, the multicollinearity problem was addressed. Then I ran the random effects models, which are presented below in Table 7.7⁶.

Table 7.7 presents the results from the random effects models concerning the impact of spatial level characteristics on the relationship between incarceration and hourly wages. Upon examination, the estimates from models 1 and 2 generate the same results⁷. In these models, five interactions were statistically significant. The significance of the violent crime

⁶ When estimating the mega model for the spatial level characteristics, I also estimated models, which contained the interaction terms for each spatial characteristic by prison. The spatial by prison interactions were not significant.

⁷ Model 2 differs from model 1 due to the absence of the main effect term percent Latino.

rate by Black suggests that, African Americans who live in urban areas with high violent crime rates earn less per hour relative to whites who live in these areas. The interaction unemployment rate by Latino was significant and indicates that Latinos who live in areas characterized by high unemployment rates have lower hourly wages relative to whites. In addition, the interaction between percent Black by Black indicates that African Americans who live in places with a large population of African Americans experience a decrease in their hourly wage relative to whites. Also, African Americans as well as Latinos who live in highly segregated places receive lower hourly wages relative to whites. The findings from models 1 and 2 support hypotheses 1, 3, 5 and 7, which address the impact of the violent crime rate, the unemployment rate, African American concentration, and residential segregation on minorities. Therefore the results indicate that the relationship between race and hourly wages is shaped by local labor market characteristics.

In estimating models 3 and 4, I wanted to determine which empirical model best described the theoretical discussion concerning the impact of spatial characteristics on the hourly wages. Based upon the OLS models, I discovered that the models had potential collinearity problems when estimating both residential segregation and minority concentration simultaneously. This discovery resulted in me separating the models. In model 3, I eliminated all of the terms related to Black/White and Latino/White residential segregation. From this model, only three interactions (violent crime rate by Black, unemployment rate by Latino and percent Black by Black) were statistically significant. These three interactions have a negative effect on hourly wages. The estimates of these coefficients were very similar to the coefficients presented in model 2. In model 4, I eliminated all of the terms related to African American and Latino concentration. Four interactions (violent crime rate by Black, unemployment rate by Latino, Black/White residential segregation by Black and Latino/White residential segregation by Latino) were significant in this model. Each of these interactions has a negative effect on hourly wages.

The results from models 3 and 4 both support hypotheses related to the negative impact of spatial characteristics on hourly wages. However, when comparing the estimates of these models, the coefficients are relatively the same. Both residential segregation and minority concentration measures affect hourly wages in local labor markets. Therefore, I reached the same substantive conclusions concerning the impact of spatial characteristics on hourly wages using either model. Perhaps reaching the same substantive conclusion whether residential segregation or minority concentration measures are present in the model may be a function of the theoretical overlap, which exists between these literatures.

Table 7.7. Random Effects Models of Log Hourly Wage on Spatial Level Measures and Selected Variables for NLSY Men, 1979-1998.

	(1)	(2)	(3)	(4)
Prior Incarceration	-0.130*** (9.00)	-0.137*** (9.01)	-0.137*** (9.01)	-0.138*** (9.05)
Black	-0.072*** (10.19)	-0.072*** (10.20)	-0.072*** (10.30)	-0.077*** (11.46)
Latino	-0.030*** (3.32)	-0.029*** (3.32)	-0.036*** (4.14)	-0.021** (2.54)
Prior Incarceration*Black	0.011 (0.42)	0.011 (0.42)	0.011 (0.39)	0.014 (0.52)
Prior Incarceration*Latino	0.006 (0.18)	0.006 (0.18)	0.008 (0.25)	0.008 (0.23)
Violent Crime Rate	0.00006 (1.57)	0.00005 (1.72)	0.0005 (1.64)	0.0005 ⁺⁺ (2.09)
Unemployment Rate	-0.009 (1.44)	-0.008 (1.59)	-0.010* (1.71)	-0.006 (1.30)
Percent Black	0.0002 (0.14)	0.00006 (0.06)	0.00034 (0.28)	-
Percent Latino	0.0003 (0.19)	-	0.0012 (0.83)	-
Black/White Residential Segregation	-0.05 (1.19)	-0.055 (1.28)	-	-0.052 (1.24)
Latino/White Residential Segregation	0.09 (0.93)	0.097 (1.05)	-	0.10 (1.13)
Violent Crime Rate*Black	-0.00005*** (3.58)	-0.00005*** (3.58)	-0.00004*** (3.09)	-0.0005*** (3.75)
Violent Crime Rate*Latino	0.00002 (1.15)	0.00002 (1.14)	-0.00002 (1.23)	0.00002 (1.60)
Unemployment Rate*Black	0.010 ⁺⁺⁺ (2.26)	0.010 ⁺⁺⁺ (2.25)	0.007 (1.67)	0.010 ⁺⁺ (2.31)
Unemployment Rate*Latino	-0.046*** (7.60)	-0.046*** (7.64)	-0.045*** (7.40)	-0.035*** (7.04)
Percent Black*Black	-0.0018*** (2.72)	-0.0018*** (2.72)	-0.0018*** (2.75)	-
Percent Latino*Latino	0.003 ⁺⁺⁺ (3.30)	0.003 ⁺⁺⁺ (3.34)	0.0025 ⁺⁺ (2.56)	-

Table 7.7. (Continued).

	(1)	(2)	(3)	(4)
Residential Segregation*Black ^a	-0.074*** (2.81)	-0.074*** (2.81)	-	-0.076*** (2.92)
Residential Segregation*Latino ^a	-0.31*** (3.90)	-0.31*** (3.90)	-	-0.25*** (3.33)
Intercept	1.84	1.84	1.84	1.84
-2 Log Likelihood	41478.6	41467.6	41487.3	41448.0

^a This variable represents the race coefficient for African Americans or Latinos at the individual level. Person Years = 36,946. Absolute value of t statistic in parentheses

Note: These estimates are based upon variables centered around the grand mean. The estimates are unstandardized. Table 7.7 presents results for variables of substantive interest only. All models include the following control variables: hours worked per week, marital status, living in the suburbs, central city, current school enrollment, current incarceration, age, education, and cognitive skill. The control variable results are presented in the Appendix, Table A.11.

*p<.05 **p<.01 ***p<.001 (one-tailed tests)
⁺p<.05 ⁺⁺p<.01 ⁺⁺⁺p<.001 (two-tailed tests)

7.11 Discussion

In this chapter I examined the impact of incarceration and spatial level characteristics on earnings. The random-effects models tested hypotheses pertaining to the influence of incarceration and spatial measures on earnings net of other factors and controlling for an MSA level error term. A key assumption associated with the random effects models is that α and the Xs are not correlated. The α represents unobserved differences among the MSAs. Since the estimates generated in the random effects model are typically slightly lower than the OLS estimates, I am confident that these models are correctly allowing for the unobserved heterogeneity across metropolitan areas (see Hsiao 2001, Allison 1996). While most of the estimates generated from the random effects models provide unbiased estimates of β and the covariance matrix of

these estimates (see Allison 1994), I think that the Latino/White residential segregation coefficients are suspect. This is due to the change in sign as well as magnitude of the coefficients when comparing OLS and random effects estimates.

Overall, both the OLS and random effects models supported the hypotheses concerning how spatial measures contribute to racial/ethnic hourly wage disparities. The results suggest that the total race/ethnicity effect is impacted by the presence of spatial level processes. Thus, race/ethnicity and spatial dynamics interact and influence hourly wages. The results indicate that for African Americans, living in a city with a high violent crime rate, or living in a city with a large population concentration of African Americans, or living in a city with high levels of residential segregation lowers hourly wages. The results suggest that Latinos who live in cities with a high unemployment rate, or live in cities with a large concentration of Latinos, are more likely to have lower hourly wages.

After examining the impact of the four spatial characteristics separately, I estimated a model in which I had to check for multicollinearity. Once I assessed the potential collinearity issues, I estimated four models. The last two models provided support for the hypotheses concerning the impact of spatial measures on the earnings of racial/ethnic minorities. Also these models enable me to reach similar substantive conclusions concerning the influence of residential segregation and minority concentration on hourly wages.

However, the OLS and the random effects models did not support the hypotheses concerning the impact of spatial measures for the earnings of ex-offenders. Therefore, the prison effect on hourly wages is not conditioned by spatial level measures. The results suggests that perhaps for ex-offenders, as well as for other citizens, the stereotypes concerning race/ethnicity and spatial characteristics of the labor market play a more important role in the hiring process than any increased stigmatization of incarceration. Thus, the models in this chapter provide substantial

evidence that the relationship between hourly wages and race/ethnicity is influenced by the characteristics of the MSA in which respondents live.

7.12 Summary

I explored the theoretical literature that focused on spatial level processes to investigate the earnings trajectories of ex-offenders are shaped by the characteristics of the labor markets in which they reside. I discussed four mechanisms: perceived threat of criminality, labor demand, perceived threat of minority population and spatial mismatch and residential segregation and how they are linked to racial/ethnic disparities in earnings. After providing information concerning the data, methods and modeling strategy, I reported OLS and random effects model estimates for four distinct spatial level measures: violent crime rate, unemployment rate, African American concentration, Latino concentration, Black/White residential segregation and Latino/White residential segregation. In addition, I also estimated a model, which included all of the spatial level characteristics and their interactions with race/ethnicity. The results of the random effects models support the hypotheses that suggest that the costs of being African American and Latino coupled with the various spatial characteristics lead to lower hourly wages when compared to whites.

CHAPTER 8

CONCLUSIONS

8.1 Project Summary

This project comes out of an effort to gain insight into the consequences of incarceration for ex-offenders, particularly those ex-offenders who are members of minority racial/ethnic groups. Although a great deal of this work focuses on the determinants of incarceration, less attention has been given to the differential consequences of incarceration on labor market outcomes for racial/ethnic group members. Since research of this nature is a fairly undeveloped area, this project offers a theoretically unique approach to examining the consequences of incarceration for racial/ethnic group members by combining inequality theories, labor market process theories, and relevant criminological perspectives.

Implementing this theoretical approach led me to the development of three research questions: To what extent does incarceration influence the employment, earnings and career trajectories of young men? Is the economic penalty of incarceration the same for individuals from different race/ethnic groups? Do characteristics of the labor market affect the relationship between incarceration and economic outcomes for individuals? To address these questions, this study replicates and extends Bruce Western's research on the impact of incarceration for wage mobility.

This study replicates Western's work by estimating OLS regression and fixed effects models to examine wage mobility across the career trajectories of a sample of young men from the NLSY. In addition, this study extends Western's research in four ways. First, I draw upon the stratification literature to discuss how the three causal mechanisms- stigma, human capital and social capital identified by Western affect how employers evaluate workers and influence labor market opportunities. Second, I extend

Western's research on the impact of incarceration because I investigate the influence of incarceration on cumulative unemployment and cumulative work experience across the career. Specifically, I examine how the stigma associated with incarceration may influence the risk of unemployment or limit work experience for ex-offenders. In addition, I also focus on understanding race/ethnic differences in cumulative unemployment, cumulative work experience and earnings more systematically than Western does in his research. I propose and estimate a fixed effects model that pools observations across race/ethnic categories and models time invariant personal characteristics as age trajectories in a single model.

Most importantly, my substantive extension of Western's research introduces the idea of examining how the incarceration-earnings relationship is influenced by the characteristics of the local labor market. I propose that the job prospects of workers are influence by prison records, race/ethnicity and spatial characteristics within metropolitan areas. In the remainder of this chapter, I highlight some of the more important results relative to my theoretical premise and hypotheses and discuss their implications for future stratification and criminological research.

8.2 Summary of Empirical Findings

Individual Level Analysis

In chapter 4, the first stage of examining the impact of incarceration on human capital accumulation across the career involved estimating fixed effects models where cumulative unemployment is the dependent variable. The fixed effects models supported the hypotheses that ex-offenders experience longer spells of cumulative unemployment than non-offenders. The models also support the hypothesis that the costs of imprisonment results in minority ex-offenders having more cumulative unemployment than white ex-offenders.

Chapter 5 addresses the second stage of examining the impact of incarceration for ex-offenders at the individual level. In this chapter, I estimated fixed effects models in which cumulative work experience is the dependent variable. The models supported the hypothesis that ex-offenders have fewer weeks of cumulative work experience. The models also supported the hypothesis that minority ex-offenders would have additional deficits of cumulative work experience than white ex-offenders net of cumulative unemployment. Once I examined how incarceration impacts human capital accumulation across the career, I estimated models where log hourly wage is the dependent variable in chapter 6. The analysis in this chapter is similar to the analysis in Western (2002). Like Western's research, the models in this study supported the hypotheses that incarceration has a negative effect on earnings and that ex-offenders have lower earnings trajectories than non-offenders. This relationship is reduced but holds, controlling for cumulative unemployment. When tenure and work experience were introduced in the model, the incarceration effect became non-significant, but the age by incarceration interaction remained negative.

However, this study did not replicate Western's finding that the earnings penalty experienced by those who had been incarcerated varies by race/ethnicity. In his study, Western estimated separate fixed effect models for whites, Latinos and African Americans. Using this strategy, Western indirectly tests the hypothesis that the earnings penalty associated with incarceration varies by race/ethnicity. Since he estimates separate models, Western assumes that career earnings processes for whites, Latinos and African Americans are theoretically distinct. In addition, Western is only controlling for the fixed effects that occur within the sub-samples. For instance, in the African American fixed effects model, α is a constant that controls for the unobserved heterogeneity that exists among African Americans in this sample.

In my study, using the strategy of interacting race/ethnicity with prison experience allows me to directly test the hypothesis that the earnings penalty associated with incarceration varies by race/ethnicity. This modeling strategy is an improvement over Western's because I assume that the career earnings process is the same for whites, Latinos and African Americans. With the inclusion of these interaction terms in a single pooled regression model, I am able to control for stable characteristics that are fixed for whites, Latinos and African Americans within this single model simultaneously. The estimated models did not support the hypothesis that minority ex-offenders have lower earnings than white ex-offenders, net of endogenous human capital.

As a result of being incarcerated, ex-offenders have higher levels of cumulative unemployment and lower levels of cumulative work experience and earnings. For each of these relationships, there is a prison effect that indicates that incarceration contributes to more cumulative unemployment, fewer weeks of cumulative work experience and lower earnings. In addition, the relationships between incarceration and cumulative unemployment and incarceration and cumulative work experience are shaped by the race/ethnicity of the ex-offender.

In the case of career earnings, there are differences in the career trajectory by race/ethnicity and by ex-offender status, but the interaction between race/ethnicity and prison experience is not statistically significant for African Americans and Latinos. This finding contradicts Western's research because he suggests that prison has weaker effects for African Americans. Western's models suggest that wages grow slowly for African Americans and the relative decline in wage growth among African American ex-convicts is slightly smaller than the relative decline for whites (2002:538). Western's finding about the relative decline in wages for African Americans is the result of a within race comparison. He does not use an incremental F test to see if the separate models he estimated for whites, African Americans and Latinos are significantly different from

each other. However, the career earnings models I estimate in this study show that the slightly smaller wage decline that Western found for African Americans is not statistically significant when it is estimated in a single pooled regression model. Although the earnings penalty associated with incarceration does not vary by race/ethnicity, the numbers of minority men in prison does suggest that African Americans and Latinos in the population will be more susceptible to experiencing a wage penalty associated with prison experience relative to whites. There is also strong evidence the African American and Latino men who have been in prison pay larger penalties in terms of unemployment and lost work experience.

Spatial Level Analysis

In chapter 7, I examined the impact of incarceration and spatial level characteristics on earnings. The random effects models supported the hypotheses that spatial level measures contribute to racial/ethnic hourly wages disparities. The results suggest that the consequence of race/ethnicity for wages is impacted by the presence of spatial level variation in crime, unemployment and race relations. Thus, race/ethnicity and spatial level processes interact to influence hourly wages. The results indicate that for African Americans, living in a city with a high violent crime rate, or living in a city with a large population concentration of African Americans, or living in a city with high levels of residential segregation lowers hourly wages. The results suggest that Latinos who live in cities with a high unemployment rate, or live in cities with a large concentration of Latinos, are more likely to have lower hourly wages.

After examining the impact of the four spatial characteristics separately, I estimated a model that contains all four spatial measures and their respective interaction terms. As a result of the inclusion of so many terms, I had to check the model for multicollinearity. Once I assessed the potential collinearity issues, I estimated four

theoretically comprehensive, but slightly different models. Race composition and residential segregation were collinear, forcing me to look at their consequences for earnings in separate models. The last two models provided support for the hypotheses concerning the impact of spatial measures on the earnings of racial/ethnic minorities. Also these models led me to reach the same substantive conclusion that residential segregation and minority concentration have a negative impact on hourly wages.

Neither the OLS nor the random effects models supported the hypotheses concerning the impact of spatial measures for the earnings of ex-offenders. Therefore, the prison effect on hourly wages does not seem to be influenced by spatial variation in crime, unemployment or race relations. The results suggest that for ex-offenders, the stereotypes concerning race/ethnicity and spatial characteristics of the labor market may interact and possibly influence how employers process job applicants with a prison record. Although the literature suggests that there are spatial effects on hourly wages for ex-offenders, the models estimated in chapter 7 did not provide evidence for the prison effect. However, the models in this chapter provide considerable evidence that the relationship between hourly wages and race/ethnicity is influenced by the characteristics of the MSA in which the respondent lives.

The Tradeoff: Fixed Effects versus Random Effects

In the individual level analysis section of the dissertation (Chapters 4-6), I used fixed effects models to estimate the impact of incarceration on labor market outcomes. Using fixed effects models to estimate incarceration effects on cumulative unemployment, cumulative work experience and hourly wages over time is advantageous because it is an effective method for controlling for unmeasured but stable individual differences. Fixed effects model estimators are powerful because they remove selectivity biases. With a fixed effect model, I am able to control for all

unobserved differences across individuals that are constant over time, regardless of whether the characteristics are associated with the outcome variable as well as time-varying control variables. In addition, fixed effects models allow me to control for other possible time invariant explanatory variables that may be related to cumulative unemployment because the main effects of these other explanatory variables are subsumed within the fixed-effects model (Allison 1994). Therefore, fixed effects models reduce measurement error associated with: (1) the unmeasured fixed attributes of individuals and (2) the influence of omitted variables that may be correlated with the observed predictors. As a result, I have obtained a relatively unbiased estimation of incarceration effects on cumulative unemployment, cumulative work experience and earnings along the career trajectory. With these estimates, I can make relatively strong inferences about the influence of being incarcerated on labor market outcomes for the NLSY sample.

In chapter 7, I used a random effects model approach to estimate the impact of incarceration and spatial characteristics on earnings. Since the spatial level data is only collected for 1990, it does not vary across time. Therefore, trying to estimate a fixed effects model in which you control for the stable measured characteristics across individuals and across MSAs over time simultaneously is impossible. This leads to the fixed effects approach not being the appropriate way to model this data. Although both fixed and random effects models help reduce error variance in grouped data, according to Hsiao, a random effects model is preferable when you have a sample from a population and fixed effects when you observe a whole population (2001:389). The NLSY clearly represents a sample of residents from each observed MSA. For the individual level models emphasized in earlier chapters, I had a complete career history rather than a sample, strengthening the appropriateness of the fixed effects model.

A key assumption concerning random effects models is that α , the random effects error term, is uncorrelated with the predictor variables that change over time. Also α is uncorrelated with the residual error term (Allison 1994:179). In this study, α represents unobserved differences across MSAs that are constant over time. Thus, this model assumes that things considered stable causes are random within MSA effects. For each MSA, this approach models the variation attributable to each unique characteristic of the MSA by fitting a random error term for each MSA. This requires multiple observations within each MSA.

One advantage of moving from a fixed effects model to a random effects model is that I can now estimate coefficients for time invariant variables (stable individual characteristics or MSA characteristics) within the model. This is due to the assumption that stable individual variables such as race and cognitive skill and the time varying individual and MSA variables in the model are not correlated with α , the unobserved differences across MSAs.

However, there is a trade-off between bias and efficiency when determining whether to use fixed versus random effects. The fixed effects approach is effective at reducing bias due to omitted explanatory variables but this occurs at the cost of possibly increasing the standard error substantively. The random effects approach reduces the standard error but is subject to bias if the standard regression assumption that the error term is uncorrelated with observed variables is violated (Allison 1997).

In this case of estimating the spatial level models, I suspect that the estimation of random effects models is more advantageous than using fixed effects models. According to Hausman (1978) under the assumption of no correlation, OLS and random effects estimates of the measured covariates should differ systematically. Therefore, when comparing random effects models to OLS models, OLS estimates lend confidence to the random effects interpretations. For the spatial analysis, random effect models and

estimation methods are better than using OLS and fixed effects models because this approach corresponds better with the information content of the data.

8.3 Major Contributions

This study makes three major contributions to the study of the consequences of incarceration. First, this study makes a theoretical distinction between exogenous and endogenous human capital. This distinction is crucial for models of racial/ethnic earnings inequality because it addresses the problem of unmeasured but fixed pre-labor market human capital, as well as the empirical reality that racial gaps in both earnings and endogenous human capital grow across careers (Tomaskovic-Devey, Thomas and Johnson 2002). Based upon the individual level analysis, this study provides support for the idea that endogenous human capital accumulation mediates the association between incarceration and earnings. Thus, there is a need to distinguish between the types of human capital and when human capital is accumulated across the career.

Second, this study actually examines how incarceration affects human capital accumulation, by estimating cumulative unemployment and work experience trajectories. The estimation of these trajectories provides information concerning how ex-offenders experience a reduction in human capital and in turn how this reduction affects their labor market opportunities. Specifically for minority ex-offenders, estimating the influence of cumulative unemployment provides information concerning the impact of unemployment spells throughout the career. Since minority ex-offenders tend to experience longer spells of unemployment, these spells contribute to deficits in work experience. Likewise, estimating -work experience trajectories has important implications for the labor market opportunities of minority ex-offenders.

Third, the modeling strategy implemented in this study improves the estimation of earnings models. In the individual level analysis, the use of fixed effects models

automatically controls for all constant unobserved heterogeneity between individuals. Removing fixed effects is particularly important for the test of whether there is a net negative effect of incarceration on earnings, because all stable earnings-relevant but unobserved individual differences between individuals have been controlled. Most importantly, those factors that may influence imprisonment and labor market outcomes are well accounted for in these models by controlling for education, cognitive skill and race as well as all unmeasured stable individual characteristics. Therefore, the inferences drawn from this analysis of longitudinal data are more powerful and provide information concerning how the consequence of incarceration affects individuals' careers over time.

Despite their limitations, the random effects models developed in chapter 7 are an improvement over spatial level analyses of wage variation that appear in the stratification literature (see Beggs, Villmez and Arnold 1997; McCall 2001). These researchers only focus on how local labor market characteristics within the census designated Labor Market Areas (LMAs) influence wage inequality using cross-sectional models. This study improves upon this modeling strategy by incorporating career processes and spatial processes to explain wage variation over time. In addition the models in this chapter are the first to look at the influence of prison on wages in a spatial context. A major finding of the study, the violent crime rate of an MSA influences racial inequality in earnings has implications for the stratification literature. Since there is not an empirical distinction between percent Black and racial residential segregation in the random effects models, this may suggest that previous literature may have been premature to settle on a racial competition thesis as an explanation of wage variation instead of spatial mismatch theory.

Based upon the theoretical model presented in this chapter, MSAs characterized by high violent crime rates, high unemployment rates, large minority populations and

high levels of residential segregation are hypothesized to decrease earnings for ex-offenders relative to non-offenders. I theorized that four spatial mechanisms would influence both prison and race/ethnicity similarly. For example, I argued that employers would be more reluctant to hire ex-offenders and African American men because of the increased perception of criminal threat. I also suspected that as the unemployment rate in the community increases that employers would refuse to hire ex-offenders and minorities. Likewise, I proposed that as the percent minority in a community increases that minority wages would decline relative to white wages. Furthermore, I argued that as residential segregation increases, the supply of locally available jobs for minorities decreases, which results in lower wages for African Americans and Latinos in highly segregated areas.

In fact this study indicates that the four mechanisms operate differently for race/ethnicity and incarceration status. Perhaps, in neighborhoods that employers perceive as crime-ridden, the stereotypes associated with racial/ethnic minorities and the notion of criminal threat overlap to the extent that employers may be extremely reluctant to hire racial/ethnic minorities. For minorities living in areas characterized by high unemployment, employers may rank them at the bottom of the labor queue. In cities where there is a large concentration of African Americans or Latinos, or there is a high level of residential segregation, the number of jobs available for minorities in the area decreases and the negative stereotypes associated with race/ethnicity are intensified to the extent that minorities receive lower wages. Although this study did not find that the labor market context influences the prison-earnings relationship, I suspect that the following contexts, the inner city spatial concentration of ex-offenders and the social capital networks of ex-offenders in their communities, may have important effect on the careers of ex-offenders and should be studied in the future.

8.4 Research Limitations

With secondary data analysis, it is almost a given that the research would be strengthened with better measures. Overall, the NLSY contains good indicators of human capital measures across the time period. The only human capital measure that is even weakly problematic is job tenure. However, human capital accumulation is only one of the three causal mechanisms that I theorized about that links incarceration to labor market outcomes. The results of this study could be strengthened if the NLSY or some other data set had measures that could be indicators of social capital and stigma.

A major limitation of the NLSY concerns how incarceration and other criminogenic behavior concepts are measured. With incarceration only being asked as a response to the question where the respondent was residing at the time of the interview, the researcher cannot address an important issue that pertains to how the consequences of incarceration may vary. For instance, researchers have no knowledge concerning the severity of the offense for which the individual has been incarcerated. The issue of severity has major theoretical implications because it can affect the extent of the stigmatization an ex-offender faces upon reintegration in society. Also the severity of the offense can affect whether an ex-offender has social capital ties that generate opportunities for legitimate versus illegal employment. Likewise, severity can influence the accumulation of human capital because employers may be even more reluctant to hire an ex-offender who commits a violent crime versus a property crime. Another set of questions used to tap into criminal behavior are only asked in 1980, when a supplemental module concerning crime was added to the survey instrument. In addition questions concerning drug and alcohol use are not asked every year. These questions could be conceptualized as indicators of self-control as well as social attachment. Having measures at such a level of specificity would add tremendous breadth and depth to the investigation and results.

A major limitation associated with the examination of spatial effects on the relationship between incarceration and earnings, is that the spatial data is only collected for the year 1990. Since three of the four spatial level measures (percent minority in the MSA, percent unemployed in the MSA, and residential segregation) are based on decennial census data, this study assumed that the values associated with these measures did not change significantly over the time period. Likewise, this study also makes the assumption that the violent crime rates did not change dramatically from one year to the next and used 1990 UCR data. The data limitation suggests that future research based upon this mixed model approach must merge time-varying aggregate level data with individual level data. Therefore, this modeling strategy can be used to learn how spatial mechanisms can affect wage mobility.

8.5 Future Research

The findings from this study provide a springboard to the development of future research concerning the consequences of incarceration. In terms of the individual level analysis, this study only tests the influence of human capital accumulation on the relationship between incarceration and earnings. Future research in this area should examine the mechanisms of stigma and social capital and empirically test how they influence the relationship between incarceration and labor market outcomes. By empirically testing these mechanisms, we can learn more about how employers process ex-offender job applicants as well as information concerning whether or not ex-offender networks generate information about good jobs.

Designing a spatial level study that has time-varying data at the MSA level would allow me to examine within-city variation across the time period. The assumption that the individual error term is not correlated with city characteristics can be tested in future research if MSA values are allowed to vary over time. In this study, I used comparisons

to OLS estimates to reduce the chance of making a false inference. Incorporating time-varying MSA data may generate even more powerful results and provide information concerning how the spatial level mechanisms influence wage variation for ex-offenders and non-offenders.

The next logical progression in the study of the consequences of incarceration is to examine these effects at the neighborhood level. Some scholars have proposed that incarceration has potentially negative consequences for communities, including contributing to higher levels of crime (Rose and Clear 1998; Lynch and Sabol 2000). Rose and Clear (1998) were among the first to express concerns about the potential negative role of high levels of incarceration on communities. They argue that models of crime that emphasize the role of removing offenders from communities fail to take into account the feedback effect of public social control strategies (e.g., incarceration) in increasing social disorganization within areas by: (1) undermining socioeconomic composition through its influence on labor markets, marriage markets, and other resources; (2) contributing to mobility in and out of the neighborhood; and (3) increasing the cultural heterogeneity of areas as prison releasees bring deviant orientations back to communities. The resulting social disorganization leads to higher levels of crime. Rose and Clear go on to argue that these processes are especially consequential for disadvantaged minority communities which have suffered "war-level casualties in parenting-age males during the increase in imprisonment since 1973" (1998:451). There is a need for empirical research to address the claim that incarceration has a detrimental influence on neighborhood crime and other neighborhood social conditions.

8.6 Public Policy Implications

The ideas and findings presented in this dissertation suggest that lack of human capital accumulation, weak social capital in terms of information concerning legitimate

employment opportunities, and the stigma associated with incarceration affect the labor market outcomes for ex-offenders, particularly racial/ethnic minorities. In addition, the characteristics of the labor markets in which people reside influence the relationship between race/ethnicity and labor market outcomes.

The public policy implications for this research suggests that the criminal justice system must first rehabilitate itself before the subject of rehabilitating ex-offenders can be addressed. According to Reiman (2001), the elimination of poverty is the most promising crime fighting strategy. Although poverty itself per se does not result in crime, the contextual effects associated with poverty such as lack of good education, lack of parental authority and lack of cohesive communities, contribute to the conditions that lead to crime (2001:191).

Since young minority males, particularly African American males are statistically more likely to engage in street crime, they are more likely to be prosecuted than white-collar offenders. As a result of the disparity between the prosecution of crime that occurs in the suites (white collar crime) and crime that occurs in the streets, the problem of mass incarceration plagues the criminal justice system. This emphasis of prosecuting street crime offenders results in large numbers of minority men experiencing a prison sentence. Unfortunately, for many of these men, prison has become a right of passage. The mass incarceration of young minority males is an example of how race/ethnicity and class interact to undermine the social and economic well being of these groups.

In the face of increasing incarceration rates for young minority men and the lack of funding appropriated to rehabilitation programs, the situation for these men and their communities appears to be rather bleak. Instead of reducing crime, prisons have served as vehicles for producing crime. Rehabilitative programs (e.g, formal or vocational education, work release, transitional aid or supported work) are needed to assist these men in securing desirable work. These programs should have a two-point programmatic

thrust. First, the program would have to educate employers about hiring workers with a criminal background. If the program could provide some economic incentives for employers then I think employers may be willing to hire ex-offenders. The second aspect of the program should focus on educating the offender. Most states should appropriate a larger percentage of their correctional services budget to pre-release programs that prepare ex-offenders for their actual transition from prison to their respective communities. Incorporating more time, energy and money into pre-release planning may equip more inmates with the tools necessary to overcome the obstacles associated with successful reintegration in society.

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APPENDIX

Table A.1 . Regression Results for Control Variables for Fixed Effects and OLS Models Reported in Table 4.1.

	(1)	(2)	(3)	(4)	(5)	OLS Model
Hours worked	0.094*** (18.76)	0.092*** (18.21)	0.091*** (18.15)	0.091*** (18.14)	0.091*** (18.20)	-0.36*** (36.09)
Marriage	-3.68*** (14.95)	-3.58*** (14.57)	-3.32*** (13.57)	-3.34*** (13.57)	-3.34*** (13.65)	-13.50*** (34.01)
Suburban Residence	-1.06** (3.08)	-1.14*** (3.31)	-1.25*** (3.64)	-1.25*** (3.62)	-1.25*** (3.61)	-5.10*** (10.53)
City Residence	0.94** (2.77)	0.88** (2.61)	0.76** (2.26)	0.76** (2.26)	0.76** (2.23)	2.75*** (6.14)
Current School Enrollment	0.17 (0.51)	0.03 (0.27)	0.23 (0.66)	0.23 (0.65)	0.22 (0.66)	-12.61*** (19.57)

Note: Absolute t ratios in parentheses

Table A.2 . Regression Results for Control Variables for Unemployment Lag Variable Model Reported in Table 4.2.

	OLS Model
Hours worked	-0.072*** (41.55)
Marriage	-0.798*** (11.64)
Suburban Residence	-0.281** (3.37)
City Residence	-0.032 (0.42)
Current School Enrollment	-1.92*** (17.28)

Note: Absolute t ratios in parentheses

Table A.3 . Regression Results for Control Variables for Fixed Effect and OLS Models Reported in Table 5.1.

	(1)	(2)	(3)	(4)	(5)	(6)	OLS Model
Hours worked	-0.29*** (24.08)	-0.27*** (22.55)	-0.27*** (22.59)	-0.27*** (22.57)	-0.27*** (22.56)	-0.27*** (22.56)	0.55*** (23.56)
Marriage	13.95*** (23.82)	13.18*** (22.85)	12.66*** (21.99)	12.64*** (21.95)	12.62*** (21.93)	12.62*** (21.93)	20.71*** (22.40)
Suburban Residence	3.19*** (3.88)	3.80*** (4.69)	4.07*** (5.04)	4.05*** (5.02)	4.03*** (4.99)	4.03*** (4.99)	12.42*** (11.08)
City Residence	4.02*** (4.98)	4.46*** (5.61)	4.70*** (5.93)	4.70*** (5.93)	4.69*** (5.91)	4.68*** (5.91)	-3.51*** (3.39)
Current School Enrollment	-5.00*** (6.16)	-3.81*** (4.78)	-4.26*** (5.35)	-4.26*** (5.35)	-4.25*** (5.33)	-4.25*** (5.33)	-1.00 (0.68)

Note: Absolute t ratios in parentheses

Table A.4 . Regression Results for Control Variables for Fixed Effect and OLS Models Reported in Table 6.1.

	(1)	(2)	(3)	(4)	(5)	(6)	OLS Model
Hours worked	0.0001 (1.55)	0.0001* (1.87)	0.0001* (1.86)	0.0001* (1.87)	0.0001* (1.87)	0.0001 (1.53)	0.0004*** (5.05)
Marriage	0.093*** (23.00)	0.093*** (22.78)	0.091*** (22.45)	0.091*** (22.42)	0.091*** (22.43)	0.075*** (18.55)	0.13*** (34.66)
Suburban Residence	0.058*** (10.28)	0.059*** (10.40)	0.060*** (10.53)	0.060*** (10.53)	0.060*** (10.54)	0.056*** (10.04)	0.17*** (37.99)
City Residence	0.040*** (7.19)	0.040*** (7.28)	0.041*** (7.39)	0.041*** (7.39)	0.041*** (7.39)	0.040*** (7.25)	0.113*** (27.45)
Current School Enrollment	-.184*** (32.76)	-.183*** (32.51)	-.184*** (32.72)	-.184*** (32.71)	-.184*** (32.72)	-.172*** (30.84)	-0.166*** (27.89)

Note: Absolute t ratios in parentheses

Table A.5 . Regression Results for Control Variables for OLS and Random Effects Models Reported in Table 7.1.

	OLS Model	Random Effects
Hours worked	0.0017*** (13.14)	0.0016*** (12.73)
Marriage	0.173*** (34.08)	0.175*** (34.79)
Suburban Residence	0.124*** (14.31)	0.104*** (11.89)
City Residence	0.070*** (8.56)	0.061*** (7.33)
Current School Enrollment	-.185*** (23.50)	-.185*** (23.89)

Note: Absolute t ratios in parentheses

Table A.6. Regression Results for Control Variables for OLS and Random Effect Models Reported in Table 7.2.

	OLS Model	Random Effects
Hours worked	0.0017*** (13.17)	0.0016*** (12.72)
Marriage	0.166*** (32.68)	0.174*** (34.72)
Suburban Residence	0.135*** (15.52)	0.106*** (12.06)
City Residence	0.081*** (9.73)	0.061*** (7.37)
Current School Enrollment	-.180*** (22.86)	-.185*** (23.92)

Note: Absolute t ratios in parentheses

Table A.7. Regression Results for Control Variables for Random Effect and OLS Models Reported in Table 7.3.

	OLS Model	Random Effects
Hours worked	0.0017*** (13.33)	0.0016*** (12.70)
Marriage	0.165*** (32.40)	0.174*** (34.66)
Suburban Residence	0.133*** (15.22)	0.105*** (11.96)
City Residence	0.081*** (9.67)	0.062*** (7.47)
Current School Enrollment	-.181*** (22.88)	-.185*** (23.85)

Note: Absolute t ratios in parentheses

Table A.8. Regression Results for Control Variables for Random Effect and OLS Models Reported in Table 7.4.

	OLS Model	Random Effects
Hours worked	0.0017*** (13.41)	0.0016*** (12.75)
Marriage	0.167*** (32.97)	0.174*** (34.65)
Suburban Residence	0.131*** (15.08)	0.105*** (11.98)
City Residence	0.072*** (8.65)	0.062*** (7.39)
Current School Enrollment	-.181*** (22.99)	-.185*** (23.84)

Note: Absolute t ratios in parentheses

Table A.9. Regression Results for Control Variables for Random Effect and OLS Models Reported in Table 7.5.

	OLS Model	Random Effects
Hours worked	0.0017*** (13.41)	0.0016*** (12.75)
Marriage	0.167*** (32.97)	0.174*** (34.65)
Suburban Residence	0.131*** (15.08)	0.105*** (11.98)
City Residence	0.072*** (8.65)	0.062*** (7.39)
Current School Enrollment	-.181*** (22.99)	-.185*** (23.84)

Note: Absolute t ratios in parentheses

Table A.10. Regression Results for Control Variables for Random Effect and OLS Models Reported in Table 7.6.

	OLS Model	Random Effects
Hours worked	0.0017*** (13.42)	0.0016*** (12.73)
Marriage	0.170*** (33.53)	0.175*** (34.72)
Suburban Residence	0.118*** (13.52)	0.105*** (11.87)
City Residence	0.065*** (7.87)	0.062*** (7.39)
Current School Enrollment	-.181*** (23.04)	-.185*** (23.82)

Note: Absolute t ratios in parentheses

Table A.11. Regression Results for Control Variables for Random Effect and OLS Models Reported in Table 7.7.

	(1)	(2)	(3)	(4)
Hours worked	0.0016*** (12.67)	0.0016*** (13.03)	0.0016*** (12.69)	0.0016*** (12.72)
Marriage	0.175*** (34.86)	0.174*** (34.47)	0.175** (34.84)	0.175** (34.85)
Suburban Residence	0.104*** (11.89)	0.119*** (13.70)	0.105*** (12.02)	0.105*** (11.91)
City Residence	0.062*** (7.43)	0.067** (2.36)	0.061** (7.34)	0.061** (7.31)
Current School Enrollment	-0.185*** (23.96)	-0.183*** (23.43)	-0.185*** (23.98)	-0.185*** (23.96)

Note: Absolute t ratios in parentheses