Where do they live now? Racial variation in the effect of incarceration on neighborhood disadvantage.

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Abstract

The expansion of the penal state has been one of the most dramatic developments in contemporary American Society. Current estimates suggest that one of every 100 American adults is now incarcerated, and each year more than 700,000 individuals are released from prison, numbers that represent a five-fold increase from just a few decades earlier. This dramatic expansion spurred a wealth of research which has focused on the detrimental impact incarceration has on a range of life course outcomes including employment, wages, health, and marital stability. Notably missing from this literature is a systematic examination of the potential impact that incarceration has on the communities to which ex-inmates return following their release from prison. Using nationally representative panel data, this study begins to fill this empirical gap by examining the relationship between incarceration and levels of neighborhood disadvantage. Controlling for neighborhood of origin, we find that upon release incarceration is associated with residence in more disadvantaged neighborhoods, especially for white ex-inmates. These findings have direct implications for understanding the social consequences of the expansion of the penal state as well as the patterns of residential mobility and disadvantage.

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INTRODUCTION

In the last three decades the United States has witnessed a remarkable expansion of the penal system. The United States now has the highest incarceration rate in the world (Raphael 2007), and moreover, since the mid-1970s the prison population has quadrupled. Currently, one of every 100 American adults is now incarcerated (PEW 2008), and this dramatic expansion reflects one of the largest policy experiments of the 20th Century (Spelman 2000). Recent research has investigated the transformative impact this "experiment" has had on incarcerated individuals and their families. In this paper examine the impact of the prison boom on communities.

There is an expanding literature that demonstrates the role of incarceration as an important source of differential life chances for ex-inmates and their families (see overviews in Petersilia 2003 and Travis 2005). For instance, incarceration has been associated with depressed wages (Western 2002) decreased employment opportunities (Pager 2003) diminished health functioning (Massoglia 2008) and marital insatiability (Massoglia, Remster, King forthcoming and Lepoo and Western 2005). Despite these advances there is a surprising little systematic evidence examining the impact of the prison boom on communities. This gap, in part, stems from a scarcity of longitudinal data with measures of both incarceration and residential location. The limited evidence we do have consists of largely anecdotal first-person accounts or is based on localized samples (see, for example, Maruna 2001). This study starts to fill in this empirical gap by analyzing the relationship between incarceration, offender reentry and neighborhood disadvantage.

We start by discussing the expansion of the incarceration system and the challenges in inmate reentry in more detail, with a specific focus on research examining the effect that incarceration has on individual outcomes. We then discuss the theoretical mechanisms that drive our hypothesis on incarceration and disadvantaged neighborhoods. After introducing our data and methods, we test the relationship between reentry and neighborhood disadvantage using nationally representative longitudinal data tracking over 12,000 individuals for more than 20 years. Additionally, these data are notable for our inquiry because they contain residential identifiers, at multiple geographic levels, for all respondents in the data. Thus, we can track individuals for over two decades as they make several meaningful life course transitions, including in some same cases, in and out of prison.

Incarceration and Reentry

While the dramatic rise in incarcerated is certainly striking, also notable is the racial disparity that has accompanied this increase. Current estimates project that one of every five African-American men will be incarcerated during his lifetime (Pettit & Western 2004) and among those who did not graduate the high school this percentage climbs to almost 60 percent. While such numbers are striking, they take on additional meaning because they are 5 to 8 times higher than those of comparable whites. Although it has gotten considerably less attention the expansion of the penal state has also been geographically concentrated. Not surprisingly, the overall expansion of incarceration was greatest for black males in inner cities and other urban areas (Lynch and Sabol 1997). When considered against the continued high levels of residential racial segregation (Lee

et al. 2008), it is clear that a systematic investigation of the impact of incarceration on communities is past due. Indeed, it is now clear that many correctional the policy initiatives – for instance policies that penalized crack usage much more severely than power cocaine -- served to both swell the prison population while also contributing to the concentration of incarceration in certain geographical areas. The policy shifts have contributed to, by some accounts, geographic incarceration rates that approach 25% in some areas (Lynch and Sabol 2004)[1].

Sometimes forgotten in discussions of the scope of the penal system is the fact that the overwhelming majority of inmates are eventually released. The ballooning of the inmate population is thus inevitably followed by an unprecedented ballooning of the ex-inmate population. Over 700,000 individuals are released each year from state and federal prisons. This number is approximately equal to the number of males who graduate yearly from four-year colleges (Mauer 2006; National Center for Educational Statistics 2004). Restating these remarkable figures, the number of people released from prison *each year* comprise a population larger than the city populations of Boston, Massachusetts or Washington, D.C.. Between 1980 and 2000 the number of ex-inmates residing in communities, and often concentrated in certain geographical areas of communities, increased from 1.8 million to 4.3 million (Raphael & Stoll 2004).

In perhaps the most striking assessment of correctional policies, Uggen and colleagues (2006) argue that a new "felon class" has emerged in society -- a class comprising about 7 percent of the total adult population, over 20 percent of the black adult population, and one-third of the black adult male population. Scholars have begun

[1] Research by Rose and Clear (1998) as well as Lynch and Sabol (2004) has found that high rates of incarceration within neighborhoods is damaging to community organization and informal social control.

to explore this felon class, especially noting the effects that the stigma of a criminal record has across different individual outcomes including employment (Pager 2003), employment, wages (Western 2002) and marital dissolution (Massoglia et al forthcoming). Perhaps most relevant for the current research, there is mounting evidence that expansion of the incarceration system produces impacts that extend well beyond the incarcerated individual. Research has found, for instance, that parental incarceration is associated with externalizing behavior in children (Wildeman 2009), as well as child poverty and debt (Wildeman 2009; Harris et al. 2010). Yet, as the sphere of this impact continues to grow, the expansion of the penal state has been linked to the outcome of multiple state and even national elections (Uggen and Manza 2002), racial disparities in health (Massoglia 2008) and the marriage market in some minority communities (Staples 1987; Wilson 1980). Still notably absent, however is the impact the penal state may have on residential inequality.

Reentry & Neighborhood Socioeconomic Inequality

We now more closely examine the current state of the literature on incarceration, reentry and neighborhood inequality. There are, in actuality, multiple avenues through which incarceration can impact neighborhood inequality. And while there exists a small literature examining possible economic benefits of the prison boom in some communities (King et al. 2004, Hooks et al. 2004; Hooks et al. 2010), we focus primarily on the concentration of inmates and ex-inmates in disadvantage areas. Indeed, the bulk of the research on ex-inmate reentry has focused on the significant and wide-ranging negative impacts of re-entry on communities. Research conducted by through the Returning Home

project, conducted by the Urban Institute, provides the best insight to date on the geographic concentration of ex-inmates. In a multi-city frame, the project involves following released inmates over time. In Chicago, for example, of the 400 ex-inmates followed after prison, 54 percent returned to just 7 of the 77 Chicago community areas[2] (Visher and Farrell 2005). Furthermore, 30 percent of the returning offender sample in Baltimore resided in 6 of the 55 communities areas (La Vigne and Kachnowski 2003). Similar trends have been noted by Urban Institute researchers in Cleveland, Ohio (La Vigne and Thompson 2003), and Houston, Texas (Watson et al. 2004). Such findings are consistent with evidence from Brooklyn, where 3 block groups in Brooklyn (representing 9 percent of the total population) housed over 26 percent of Brooklyn's parolees (see Travis 2005).

These qualitative accounts provide very useful information on the spatial concentration of ex-inmates. The findings of these studies also demonstrate that the areas where ex-inmates are concentrated are also among the most disadvantaged areas within the specific cities or counties (Visher and Farrell 2005; La Vigne and Mamlian 2003; La Vigne and Kachnowski 2003). What these studies cannot tell us, however, is if there is any direct effect of concentrated incarceration and reentry on the neighborhoods in which ex-inmates reside. That is, do ex-inmates reside in neighborhoods after prison that are more socioeconomically disadvantage then their pre-prison neighborhoods?

Even a small effect of incarceration on neighborhood disadvantage could have significant and far reaching effects, especially given the strong association between

[2] We use the term 'community area' here to maintain consistency with the terminology used by the Urban Institute researchers. In both Chicago and Baltimore, the community areas are aggregations of census tracts created by city planners meant to more or less reflect neighborhoods in the respective cities.

disadvantage and a range of both neighborhood and individual outcomes. A long line of research has shown that more disadvantaged neighborhoods have higher levels of crime (Sampson and Groves 1989; Roneck and Maier 1991; Warner and Pierce 1993; Bellair 1997; Hipp 2007a). This effect could become even more pronounced if these same neighborhoods are also experiencing a large influx of returning offenders. Hipp and Yates (2009) suggested several pathways through which returning parolees could affect neighborhood crime, including a direct effect based on their own offending and indirect effects working through criminal networks and informal social control. Their examination of parolees in Sacramento suggests that Census tracts with more parolees per capita have higher levels of aggravated assault, robberies and burglaries (Hipp and Yates 2009).

At the individual level, neighborhood disadvantage has been linked to a range of negative outcomes. Amongst children and adolescents, residing in a disadvantaged neighborhood is associated with infant mortality, low birth weight, teenage childbearing, dropping out of high school, child maltreatment, and adolescent delinquency (see Sampson, Morenoff and Gannon-Rowley 2002). Sampson and colleagues (2008) have also shown how growing up in a disadvantaged area can lead to delayed cognitive ability. Among adults, disadvantage has been linked to social isolation (Rankin and Quane 2000), depression (Ross 2000), and physical health problems (Ross and Mirowsky 2001). Prior research has also established that neighborhood disadvantage is predictive of recidivism (Kubrin and Stewart 2006; Hipp et al. 2010a). Thus, if incarceration does result in residence in a more disadvantaged neighborhood, it could contribute to the very conditions that increase the likelihood of recidivism.

Upon leaving prison, one of the most immediate and pressing issues facing ex-inmates is finding housing. The importance of securing adequate housing following prison cannot be understated (Bradley et al. 2001), and – for a range of reasons – returning prisoners often struggle to find and keep a place to love. From a general policy standpoint, supervision strategies shifted during the prison boom away from longstanding models of support and assistance and towards a greater emphasis on surveillance and control (Travis 2005; Petersilia 2003) [3]. As such, there now exists a smaller safety net in place to help ex-inmates find suitable and appropriate housing. It is also plausible that incarceration could impact neighborhood disadvantage independent of post-prison mobility status. On one hand, an individual may simply return to a neighborhood that became significantly worse while they were in prison. On the other hand, the individual could move to a more disadvantaged area following prison. We discuss these two issues in turn.

Pioneering community-level approaches to crime explored how low economic status, ethnic heterogeneity and residential mobility result in elevated crime rates in certain areas, which are maintained across time regardless of population turnover (Shaw and McKay 1942). Over time, some neighborhoods have become locked in a cycle where structural characteristics and crime and disorder reciprocally influence each other (Felson 2002; Miethe and Meier 1994; Skogan 1990). While research grounded in the social capital literature (Beyerlein and Hipp 2005; Messner, Baumer and Rosenfeld 2004; Rosenfeld, Messner and Baumer 2001) has shown how neighborhoods with ample voluntary associations might be able to better handle an influx of returning prisons, this is

[3] This, and other policy shifts such as more drug testing and stringently enforced reporting requirements, has led to an increase in technical violations.

probably not the case for the majority of the neighborhoods that ex-inmates return to. For the most part, neighborhoods with high numbers of returning offenders have higher levels of neighborhood crime (Hipp and Yates 2009; Raphael and Stoll 2004) and have lower levels of residential stability (Clear, Rose and Ryder 2001; Rose and Clear 1998).

In addition, high crime rates in a neighborhood can make it less desirable and bring down home values (Hipp et al. 2009; Schwartz et al. 2003; Tita et al. 2006). This could lead to an influx of more lower income residents into the area over time. As such, individuals leaving prison might simply go back to the same neighborhoods, which only differ in that they have become significantly more disadvantaged over time.

There is even less reason to believe that ex-inmates who move following prison will settle in better neighborhoods. Even amongst non-offenders, recent evidence shows that residents who move from neighborhoods with high levels of disadvantage go to neighborhoods with equally high levels of disadvantage (Sampson and Sharkey 2008). Furthermore, ex-inmates face a host of restrictions in both the public and private realm that make it difficult to find housing. Many ex-inmates are unable to access public housing, and long wait lists mean that this is not a viable option for those who do qualify (Travis 2005). Securing private housing is no easier. Some states provide no gate money upon release, which means that many ex-inmates cannot afford to pay a security deposit (Petersilia 2003). Background and credit checks also decrease the likelihood that ex-inmates can get approved for lease agreements (Travis 2005). All told, these restrictions and exclusionary practices could limit residential options to only a few (and likely disadvantaged) areas.

Again, the *Returning Home* project provides some useful information on the relationship between reentry and residential mobility. In Chicago, for example, almost half of the ex-inmates were living in different neighborhoods after prison (Visher and Farrell 2005). In Houston, researchers found that about one-third of the ex-inmates resided in a different neighborhood following incarceration (La Vigne et al. 2009). Some ex-inmates simply lose their pre-prison housing during their stint of incarceration. Others move because their family members relocate, and some move in order to avoid getting into further trouble back in their original neighborhoods (Visher and Farrell 2005; La Vigne et al. 2009).

Beyond descriptive accounts provided by the *Returning Home* project, there is very little research that has focused explicitly on the types of neighborhoods that returning offenders live in following prison. However, a recent study by Hipp and colleagues (2010b) begins what we hope is a rigorous empirical examination of how incarceration and reentry impact neighborhoods and communities across a range of outcomes. Here the authors use data on all California parolees to explore if sex-offenders, compared to other parolees, reside in more disadvantaged areas following prison. After geocoding respondent addresses within Census tracts, the authors find that sex-offenders both reside in and move to more disadvantage areas compared to other parolees (Hipp et al. 2010b). These results represent an important first step in examining the residential consequences of incarceration, and our analyses that follow build on it using nationally representative panel data that has neighborhood identifiers for ex-inmates both before and after prison.

When placed alongside the descriptive accounts of ex-inmate residential patterns, as well as established research on the spatial concentration of incarceration and reentry, the study by Hipp and his collaborators helps steer us towards three primary hypotheses, which will be the focus on the analyses that follow. In all cases, we test our expectations for the entire group of ex-inmates, as well as ex-inmates grouped by race/ethnicity. The individual level consequences of incarceration are not uniform across different racial groups, and so it is also necessary to explore if the effect of incarceration on neighborhood disadvantage varies for whites, blacks, and Hispanics. Furthermore, different racial groups start out in different neighborhoods, and effects of ex-inmates status might differ because of these different starting values. Our first expectation speaks to the main effect of ex-inmate status on neighborhood disadvantage:

> *Hypothesis 1: Compared to their neighborhoods prior to incarceration, ex-inmates will reside in more disadvantage neighborhoods following release from prison.*

Furthermore, an ex-inmate stigma is not one that is easy to get rid of. Ideally, individuals would be able to overcome this stigma – and the associated human and social capital losses – as they temporally distance themselves from their spell of incarceration. Scattered evidence suggests, however, that this is unlikely to be the case. Western's (2006) work on the labor market, for example, suggests that ex-inmates face wage penalties that widen over time. Any safety net provided by the U.S. post-correctional system (parole), family, or friends is likely to be short term. As time passes, this net is likely removed and ex-inmates often find themselves on their own in search of permanent

employment and housing. At this point, ex-inmates are likely to find that their residential choices are increasingly limited, which leads to our second hypothesis:

Hypothesis 2: The effect of incarceration on neighborhood disadvantage increases over the years after release from prison.

We should note that past research tells us comparatively little about whether the effects of incarceration erode or intensify over time, and hypothesis 2 is certainly a working hypothesis. However, it is insufficient to examine only the application of the ex-inmate status. To fully understand how the label impacts the residential decisions of this group also requires examining how the stigma plays out over time.

Our final hypothesis relates to the mobility patterns of returning offenders. Our prior discussion established that a sizeable proportion of ex-inmates move after prison, and that in some cases increased mobility can lead to residence in more disadvantaged neighborhoods (Hipp et al. 2010b). However, no research that we are aware of explicitly tests how ex-inmate status and post-prison mobility patterns jointly influence neighborhood disadvantage. Research from the *Returning Home* project provides only descriptive accounts, while the work of Hipp and colleagues (2010b) focuses only on moves made after leaving prison. As such, there is little empirical background from which to formulate an empirical expectation regarding ex-inmate mobility and neighborhood disadvantage. There is some evidence from mobility programs that changing a family's residential location can also change that family's lifelong prospects (Rosenbaum and DeLuca 2000). On the other hand, recent research notes that many moves tend to be lateral, in that residents of disadvantaged areas move to comparable neighborhoods (Sampson and Sharkey 2008). Thus, based on the residential restrictions

that many ex-inmates face, those who move might simply be moving to a different disadvantaged area, rather than a better one (see Clear 2007). Ultimately, there is little evidence to suggest that the relationship between incarceration and neighborhood disadvantage would work differently based on residential mobility status following incarceration.

H3: The impact of incarceration on neighborhood disadvantage will be not be significantly different based on post-prison mobility status.

In testing these expectations, we feel we make a number of important and meaningful contributions. First, we use nationally representative panel data to assess the effect of incarceration on neighborhood disadvantage. Prior research has been limited in the geographic scope of the available data. Furthermore, access to restricted data (which we discuss in more detail in the next section) allows us to compare levels of neighborhood disadvantaged in respondent's pre- and post-prison neighborhoods. Thus, rather than simply examining if ex-inmates reside in disadvantage areas (which we largely know to be the case) we are able to determine if post-prison neighborhoods are significantly more disadvantaged than pre-prison neighborhoods. We also test if the effect of incarceration on neighborhood disadvantage is uniform across all ex-inmates, or if it operates differently for different racial/ethnic groups. Finally, if our expectations regarding the association between ex-inmate status and neighborhood disadvantage are correct, this has important policy implications. Since the prison boom was largely policy driven, we will need well-informed policy to address the emerging issues associated with prisoner reentry.

DATA AND METHODS

Examining the relationship between incarceration and neighborhood disadvantage requires a combination of both individual and contextual data. We draw individual data from the National Longitudinal Survey of Youth 1979 (NLYS79), the largest nationally representative data set that contains incarceration history. In conjunction with the Bureau of Labor Statistics (BLS), data collection began in 1979 with a group of 12,686 young people between the ages of 14 and 22. Respondents were interviewed yearly from 1979 to 1994 and biennially since 1994. The 1979 start date is ideal for our purposes, as it corresponds roughly with the beginning of the prison boom in America.

With special permission from the BLS, we were granted access to restricted information identifying the census tract location of all NLSY79 respondents at each wave of data collection. Following much empirical work, we treat census tracts as proxies for neighborhoods (e.g., Massey et al. 1994; Jargowsky 1997; Quillian 2002; Logan et al. 2004; Wilkes & Iceland 2004). Although not a perfect measure of neighborhoods (Tienda 1991), census tracts appear to behave as well, or better, than other operationalizations of neighborhood boundaries (Jargowsky 1997; White 1987)[4]. The census tract identifier, which was only accessible at the BLS offices in Washington, DC, allows us to merge individual data with characteristics of respondent's neighborhoods at multiple points in time.

As of 2000, census tracts were designated for the entire United States, and potential issues concerning shifting census tract boundaries and incomplete coverage at earlier time points are mitigated using contextual data put together through a

[4] For a more detailed discussion on the implications of different geographic boundaries on estimates of residential segregation, see Lee and colleagues (2008) as well as Hipp (2007b).

collaboration of GeoLytics and the Urban Institute (GeoLytics 2006). Our primary source of census tract characteristics is the Neighborhood Change Database (NCDB), which uses census tract boundaries that are standardized to the 2000 tract boundaries. This allows us to maintain the same geographic areas across almost 30 years of data collection. Additionally, to supplement some incomplete coverage at 1980, we use a separate GeoLytics database that contains only the 1980 census tract information using the 2000 boundaries. We use linear interpolation to estimate all census tract characteristics in non-census years.

Incarceration and Ex-inmate Status

We measure incarceration based on a residence item taken at each wave of data collection, which identifies if respondents were interviewed while in prison. Since incarceration status is derived at the time of the interview, prison sentences are observed with certainty (Western 2002). As such, our measure of incarceration depicts substantial and invasive contact with the correctional system as opposed to more passing contact in local jails (Massoglia 2008). Since our research question focuses on life after release, we use this residence item to create two measures of ex-inmate status. The first is a dichotomous variable (coded 1) for each wave after a respondent gets out of prison[5]. This measure captures the stigma associated with ex-inmate status. The second is a time varying variable measuring the number of survey waves that a respondent has been out of

[5] We focus here on the first time out of prison. While some respondents went to prison multiple times, we focus here on the stigma associated with the first trip to correctional confinement. While analyzing recidivism patterns of this group of ex-inmates is certainly an avenue for future research, it is not a component of the current study. Additionally, respondents are removed from the analyses for all waves they are interviewed in prison. Finally, we limit our analyses to male ex-inmates, who make up the vast majority of the ex-inmates in our sample.

prison. This measure is included to determine if any initial effects of incarceration (what we might term the 'shock') either strengthen or weaken over time.

Neighborhood Disadvantage

We capture neighborhood disadvantage as an index (average *z*-scores) of the extent of poverty, joblessness, female headed families and families on public assistance. Each of these measures is available at the census tract level. Disadvantage levels were created by first standardizing the four measures (subtract each respondent's score from the mean and dividing by the standard deviation) and then averaging them at each wave. This creates a measure with a mean of roughly zero at each time point, with higher scores reflecting residence in a more disadvantage neighborhood. This measure was highly reliable, with an average alpha of approximately 0.90 across the range of the survey waves.

Standardizing the measure results in a mean disadvantage score across all waves that is approximately zero. Negative scores indicate disadvantage levels lower than the overall sample mean, while positive scores represent disadvantage scores higher than the overall sample mean. Some notable differences emerge when we examine disadvantage scores in more detail. White respondents had the lowest (consistently negative) neighborhood disadvantage scores, while black respondents lived in neighborhoods, on average, with the highest disadvantaged scores. Hispanic neighborhood disadvantage scores fell, on average, roughly in between blacks and whites (but were consistently positive).

Control Variables

Our regression models also control for a range of relevant time-varying variables. With access to yearly census tract locators, we were able to create a measure of the number of inter-tract moves a respondent made throughout the survey period. This count variable goes up by one for each additional move, and waves in which there was no move were coded according to the prior wave. Another benefit of having access to yearly neighborhood locators is that we were able to create a measure of inter-tract mobility immediately following a spell of incarceration (compared to the pre-prison neighborhood), and we will come back to this measure shortly.

We control for educational attainment using a count measure of the number of years a school a respondent completed. We measure SES as a dichotomous indicator if a respondent's household income was at or below the federally established poverty level for a given year[6]. Poverty levels vary in terms of family size, and this measure takes this variation into account. We also include dichotomous measures (coded 1) if respondents reported owning or making mortgage payments on a home, and if they reported residing in public housing at the time of the interview.

Analytic Strategy

To estimate the effect of incarceration on neighborhood disadvantage, we utilize fixed effects analytic models. Given the longitudinal nature of the NLSY, fixed effects models – which calculate derivations from person-specific means – will give us conservative results based on within-person change over time. To accomplish this, we transformed the 23 waves of individual data into person-period observations. For the

[6] While some readers will likely suggest that a yearly income measure would be a more appropriate measure of SES, high missingness on this variable from wave-to-wave inhibits us from confidently including it in regression models.

entire sample, this results in 291,778 person observations. After adjusting models for missing data, however, our main analytic sample has 183,457 person-observations.

By focusing on within-person change, fixed effects models account for time stable sources of spuriousness such as gender and race. However, since there is evidence that the stigma of ex-inmate status is disproportionately felt between different racial and ethnic groups, we run parallel regression models for whites, African-Americans and Hispanics. To test hypothesis 3, we also run parallel models based on the mobility status of ex-inmates following incarceration. By separately estimating models for movers and non-movers we can determine if incarceration is more predictive of neighborhood disadvantage because people go home to neighborhoods that have gotten worse or if they move to new neighborhoods that are more disadvantaged.

RESULTS

Before presenting our regression results, it is useful and illustrative to review some of the sample descriptive statistics. Table 1 presents descriptive statistics for our variables of interest[7]. After removing ex-inmates who we do not have neighborhood identifiers, we have a total of 557 respondents who enter into the data set at some point as an ex-inmate. When we transform the data to person-period observations, this results in over 3,000 total observations of ex-inmate status. We are able to follow ex-inmates, on average, for a little over five survey waves.

Ex-inmates entered the sample at different times, and one way to begin exploring how the association between incarceration and neighborhood disadvantage play out over

[7] Some of our descriptive statistics are missing from Table 1. The Bureau of Labor Statistics requires that all results be reviewed before being cleared for release to the researcher. At the current time, results that include some descriptive statistics of interest are still in the review process.

time is to standardize ex-inmate disadvantage levels by time out of prison, which we present in figure 1. We created sub-figures for the full sample of ex-inmates and then seperately for whites, African Americans and Hispanics. The small dashed line in each figure represents the overall sample mean (which due to the nature of the variable creation is approximately zero). The longer dashed line represents the group specific pre-prison average neighborhood disadvantage level. This was calculated by averaging all of the survey waves prior to incarceration across the respondents. The solid line depicts the average disadvantage level for all respondents at successive waves out of prison.

------- FIGURE 1 ABOUT HERE ------

One thing that immediately stands out in examining Figure 1 is the differences in neighborhood disadvantage for felons and non-felons. While the disadvantage scale that we created has an overall mean very close to zero, those who went to prison came from neighborhoods with, overall, much higher levels of disadvantage. Furthermore, as noted earlier, there are major differences in disadvantage levels by respondent race and ethnicity. White ex-inmates, in general, started out in least disadvantaged neighborhoods. However, it also appears that, following prison, white ex-inmates experienced the largest absolute changes in neighborhood disadvantage. Disadvantage levels for African Americans stayed relatively close to their pre-prison averages as they moved temporally away from their spell of incarceration. Hispanic ex-inmates appear to live in comparable neighborhoods immediately following incarceration, but over time their neighborhoods appear to become more disadvantaged.

To determine if these patterns are being driven by the stigma of being an ex-offender, rather than other time-varying individual characteristics, we turn to fixed effects

models estimated in Tables 2, 3 and 4. Table 2 displays the results of fixed effects models for the full sample.

------ TABLE 2 ABOUT HERE ------

Model 1 contains the control variables as well as our measure of ex-inmate status. In model 2 we drop ex-inmate status and include our measure of time out of prison, and then we include both measures in model 3. Several of our control variables are significant predictors of neighborhood disadvantage across the three models. Respondents who make more moves tend to move to areas with slightly lower disadvantage levels. Homeowners, on average, also live in less disadvantaged neighborhoods, while respondents in poverty and those residing in public housing live in more disadvantaged neighborhoods.

Restricting our scope of incarceration to only ex-inmate status (model 1) suggests that ex-inmates live in significantly more disadvantage neighborhoods following prison, as opposed to their pre-prison average. In model 2, examining only time out of prison, it also appears that the neighborhoods in which ex-inmates reside become more disadvantaged over time. However, when both of these measures are included in the full model (model 3) the effect of time out of prison is no longer significant. And while the effect of ex-inmate status is reduced, it remains statistically significant. Thus, for the full sample of ex-inmates, it appears that it is the overall stigma of ex-inmate status, rather than how this status plays out over time, that drives the relationship between incarceration and neighborhood disadvantage. However, given that there are notable differences in the initial levels of neighborhood disadvantage across racial/ethnic groups, it is possible that the results for the full sample are being driven by the different

experiences of these groups. To determine if this is the case, we estimated parallel regression models for whites, African Americans and Hispanics, which are displayed in Table 3.

------ TABLE 3 ABOUT HERE ------

We present only the full model broken down by race, and there are some very notable differences in both the focal independent measures as well as the control variables. Both black and Hispanic respondents who make more inter-tract moves tend to move to less disadvantage neighborhoods. White respondents, on the other hand, appear to move to slightly more disadvantage neighborhoods, but this could be a reflection of the very low starting levels for whites. Higher educated black respondents live in less disadvantaged areas, while increases in education are associated with slightly higher levels of disadvantage for white respondents. Again, we feel this is likely reflects the low initial levels of disadvantage for whites. Across all the groups, living in poverty is associated with higher levels of disadvantage, while owning a home is associated with living in a neighborhood with lower levels of disadvantage. Respondents living in public housing tend to reside in more disadvantage areas, but this effect is much stronger for blacks and Hispanics, compared to whites.

There are also notable differences in the effects of our incarceration measures across the sub-groups. Whites ex-inmates (model 1), following prison, both reside in more disadvantaged neighborhoods, and their neighborhoods tend to become more disadvantaged over time. Thus, not only is the stigma of incarceration predictive of neighborhood disadvantage for whites, but this stigma appears to intensify over time. African American ex-inmates (model 2), on the other hand, do not live in significantly

different neighborhoods following prison, compared to their pre-prison averages. This most likely reflects the fact that African American respondents live in, on average, more disadvantaged neighborhoods to begin with. Finally, Hispanic ex-inmates (model 3) appear to reside in significantly more disadvantage neighborhoods following prison, and this effect does not change over time. For Hispanics, the stigma of incarceration itself, rather than how this stigma plays out over time, drives the relationship between incarceration and neighborhood disadvantage.

Our results thus far suggest that ex-inmates do indeed reside in more disadvantaged neighborhoods following a spell of incarceration. However, the effect of incarceration does not operate the same for ex-inmates of different races and ethnicities. A final consideration involves the mobility status of ex-inmates immediately following prison. Comparing the pre- and post-prison neighborhoods of ex-inmates suggests a pretty strong relationship between incarceration and inter-tract mobility. Approximately 43% of the full sample moved following prison. Whites tended to move in the highest percentage (50%), followed by Hispanics (46%), and blacks (40%). We expected that incarceration would impact neighborhood disadvantage regardless of mobility status following prison, and we tested this expectation by running parallel regression models for post-prison movers and non-movers, which are displayed in Table 4.

------ TABLE 4 ABOUT HERE ------

The first column of table 4 presents the results of fixed effects models predicting neighborhood disadvantage for those who did not move following prison (for the full sample and broken down by respondent race/ethnicity). The second column presents parallel results for ex-inmates who moved to a different neighborhood after prison. There

are some notable differences between the two groups of ex-inmates. For the full sample, it appears that the effect of incarceration on neighborhood disadvantage is limited to those who did not move after prison. This suggests that ex-inmates return to neighborhoods following prison that have become more disadvantaged, and these neighborhoods become even worse over time. Post-prison movers, on the other hand, do appear to live in more disadvantaged neighborhoods, in comparison to their neighborhoods before prison.

Again, however, there are important differences between the ex-inmate sub-groups. White ex-inmates who do not move return to similar neighborhoods, but over time they tend to reside in neighborhoods that get more disadvantaged. White ex-inmates who move, on the other hand, go to more neighborhoods with higher levels of disadvantage, and these neighborhoods also become significantly worse over time. There is some evidence that black ex-inmates who move go to neighborhoods that are less disadvantaged, but this effect fails to reach conventional levels of significance. Black ex-inmates who do not move, on the other hand, live in neighborhoods that get significantly more disadvantaged over time. This is an especially notable finding, given that African American returning offenders already reside in some of the most disadvantaged neighborhoods. Finally, the effect of incarceration on neighborhood disadvantage for Hispanic ex-inmates appears to be limited to those who do not move. Again, this suggests that Hispanic ex-inmates return home to neighborhoods that became more disadvantaged during their stay in prison.

DISCUSSION

We started this paper by noting some trends in the temporal and spatial use of incarceration in the United States. Stemming largely from a series of policy changes in the 1980s and 1990s, we continue to lock people up at a very high rate. Consequently, we are starting to release people at a very high rate. Around 700,000 individuals are released from prison each year, leading to the emergence of a "felon class" in America that currently constitutes about 7 percent of the adult population. Incarceration and reentry are further stratified by gender, class and race. More males, poor people and African Americans go to prison than comparable females, affluent people and individuals of other races/ethnicities. Coupled with high levels of economic and racial inequality in housing, incarceration and reentry are also concentrated in space. In some locales as much as one quarter of the adult population incarcerated (Lynch and Sabol 2004). It is clear that individuals who go to prison start out in and go back to some of the most disadvantaged areas in the country.

Following some emerging research on the neighborhood destinations of ex-inmates (Hipp et al. 2010b), our study asked three questions. First, do returning offenders live in neighborhoods after prison that are more disadvantaged than the neighborhoods they lived in before prison? Second, do the neighborhoods of ex-inmates become even more disadvantaged over time? And finally, does the stigma of incarceration differentially impact those who move after prison compared to those who return to their original neighborhoods? For each of these questions, we also investigated if the effect of incarceration was different for white, African American and Hispanic ex-inmates.

Using unique longitudinal data that has the residential location of individuals in the years both leading up to and following a spell of incarceration, we feel that our results have started to provide some answers to these questions. Using a conservative analytical approach that models deviations from within-person means over time, we found that individuals appear to live in more disadvantaged neighborhoods after prison than before prison. Further investigation, however, revealed considerable racial variation in the effect of incarceration on neighborhood disadvantage. Both white and Hispanic ex-inmates resided in significantly more disadvantaged neighborhoods following prison. Black ex-inmates, on the other hand, did not appear to be significantly affected by their ex-inmate status. However, looking at overall racial differences in neighborhood disadvantage we suspect that black ex-inmates are not impacted to the same extent by the label because they already live in more disadvantaged neighborhoods.

Not only do white ex-inmates reside in more disadvantaged areas after prison, but their neighborhoods also get progressively more disadvantaged over time. We do not find a similar pattern of change for either African American or Hispanic ex-inmates. Thus, while we expected that the effect of the incarceration stigma would strengthen over time, it appears that this only applies to white ex-inmates. When we compared the post-prison mobility patterns of ex-inmates, however, some additional time trends emerged. Ex-inmates who do not move after prison tend to reside in neighborhoods that become more disadvantaged over time. The same pattern applies to both white and black ex-inmates who do not move. Furthermore, what we loosely termed the 'shock' of incarceration on white ex-inmates appears to be limited to post-prison movers.

These findings reflect preliminary results regarding the effect of incarceration on neighborhood disadvantage, and we should point out some areas where our results require further refinement. As such, we urge readers to use some caution in interpreting some of aspects our findings. Merging individual and contextual data across a near 30 year time period is a daunting task, and all of results will be slightly modified as we make further adjustments to the data. That said, we are confident in our findings regarding the results presented in tables 1 and 2. Furthermore, in no instance we find evidence that incarceration in any ways contributes to any sort of upward residential mobility. The results broken down by post-prison mobility status, conversely, are an avenue that we have only begun to explore. We currently only focus on a move immediately following prison. With post-prison residential locators spanning over 20 years for some ex-inmates, however, it will be useful to explore larger post-prison mobility patterns over time.

That said, we still feel that our study makes an important contribution to a growing field literature on the consequences of incarceration, and our results have important policy implications. We noted earlier that the steep rise in the prison population was largely policy-driven, rather than being tied to any dramatic increases in criminal activity. As such, shrinking our prison population is likely also going to need to be policy driven. Of course, with respect to the correctional population, policymakers must try to strike the right balance between public safety and the costs of incarceration. That said, many have started to question this balance, noting that public funds that increasingly go to the correctional system could be used for education, health, or any number of other public goods and services (PEW 2008).

Policy changes in the arena of prison reentry have also led to a smaller safety net in place for the suceesful reintegration of former offenders back in to society. The channeling of ex-inmates into more disadvantaged neighborhoods could exacerbate many of the deleterious consequences of incarceration. For example, both incarceration (Massoglia 2008) and neighborhood disadvantage (Ross and Mirowsky 2001) are associated with increased health problems. Thus, ex-inmates who move to more disadvantaged areas following prison might suffer the worse health outcomes. Furthermore, recidivism rates are higher in disadvantaged areas (Charis and Kubrin 2006; Hipp et al. 2010a). Assisting ex-inmates in securing stable housing could help decrease the likelihood of recidivism, especially if this housing is in a less disadvantaged neighborhood.

In the end, we hope that by expanding the scope of the effect of incarceration to include neighborhood inequality, future researchers will keep in mind that ex-inmates do not have a uniform post-prison experience. Some neighborhoods are better equipped to handle the myriad of issues that large numbers of ex-inmates present. Other neighborhoods are less equipped, and only expose ex-inmates to more of the conditions associated with recidivism and a return to prison.

TABLES

Table 1. Descriptive statistics for all variables; NLSY79

	Full Sample				Whites				African-Americans				Hispanics			
	N	%	Mean	SD	N	%	Mean	SD	N	%	Mean	SD	N	%	Mean	SD
Ex-inmate status[a]	557	4.39	3,033	1.35	166	2.21	--	--	287	9.04	--	--	104	5.19	--	--
Time out of prison	--	--	5.57	4.43	--	--	6.02	4.87	--	--	5.19	4.07	--	--	5.75	4.41
Number of moves[b]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Education	--	--	12.49	2.42	--	--	12.77	2.45	--	--	12.35	2.10	--	--	11.83	2.63
Family poverty status	--	--	0.16	0.37	--	--	0.11	0.31	--	--	0.26	0.44	--	--	0.19	0.39
Homeowner	--	--	0.30	0.46	--	--	0.36	0.48	--	--	0.19	0.39	--	--	0.27	0.45
Public housing	--	--	0.05	0.22	--	--	0.02	0.14	--	--	0.11	0.31	--	--	0.05	0.22
Neighborhood disadvantage[b]	--	--	0.00	0.83	--	--	--	--	--	--	--	--	--	--	--	--

a - Male ex-inmates only

b - Descriptives not available at this time due to data availability restrictions.

Note - Means and standard deviations based on person-period observations; percent ex-inmate based on total sample size (12,686)

Table 2. Fixed effects models predicting neighborhood disadvantage; NLSY79

Variable	Model 1	Model 2	Model 3
Ex-inmate status[a]	0.084 ***	--	0.064 **
	(.017)	--	(.021)
Time out of prison	--	0.010 ***	0.005
	--	(.002)	(.003)
Number of moves	-0.013 ***	-0.013 ***	-0.013 ***
	(.001)	(.001)	(.001)
Years of school	0.001	0.002	0.002
	(.001)	(.001)	(.001)
Family poverty status	0.089 ***	0.089 ***	0.089 ***
	(.004)	(.004)	(.004)
Homeowner	-0.049 ***	-0.050 ***	-0.049 ***
	(.004)	(.004)	(.004)
Public housing residence	0.198 ***	0.198 ***	0.198 ***
	(.007)	(.007)	(.007)
Constant	-0.006	-0.007	-0.007
	(.014)	(.014)	(.014)
Observations	183457	183457	183457

a - Models limited to first time out of prison

* p<.05; ** p<.01; *** p<.001; Standard errors in parentheses

Table 3. Fixed effects models predicting neighborhood disadvantage by respondent race/ethnicity; NLSY79

	Whites	African Americans	Hispanics
Variable	Model 1	Model 2	Model 3
Ex-inmate status[a]	0.135 ***	0.065	0.110 *
	(.030)	(.038)	(.048)
Time out of prison	0.014 ***	0.000	0.004
	(.004)	(.006)	(.006)
Number of moves	0.003 **	-0.031 ***	-0.018 ***
	(.001)	(.002)	(.002)
Years of school	0.003 **	-0.012 ***	0.000
	(.001)	(.003)	(.003)
Family poverty status	0.072 ***	0.078 ***	0.099 ***
	(.005)	(.009)	(.009)
Homeowner	-0.044 ***	-0.093 ***	-0.077 ***
	(.004)	(.010)	(.009)
Public housing residence	0.037 **	0.238 ***	0.220 ***
	(.011)	(.013)	(.017)
Constant	-0.419 ***	0.790 ***	0.231 ***
	(.014)	(.039)	(.035)
Observations	101163	50118	32176

a - Models limited to first time out of prison

* p<.05; ** p<.01; *** p<.001; Standard errors in parentheses

Table 4. Fixed effects models predicting neighborhood disadvantage by post-prison mobility status and race/ethnicity.

	Post-prison stayers	Post-prison movers
FULL SAMPLE		
Ex-inmate status[a]	0.074 *	0.006
	(.029)	(.023)
Time out of prison	0.011 **	0.004
	(.004)	(.003)
WHITES		
Ex-inmate status[a]	0.050	0.137 ***
	(.046)	(.031)
Time out of prison	0.019 ***	0.010 **
	(.005)	(.004)
AFRICAN AMERICANS		
Ex-inmate status[a]	0.072	-0.008
	(.052)	(.046)
Time out of prison	0.015 ***	-0.003
	(.007)	(.007)
HISPANICS		
Ex-inmate status[a]	0.153 *	0.005
	(.067)	(.056)
Time out of prison	-0.001	0.009
	(.008)	(.008)

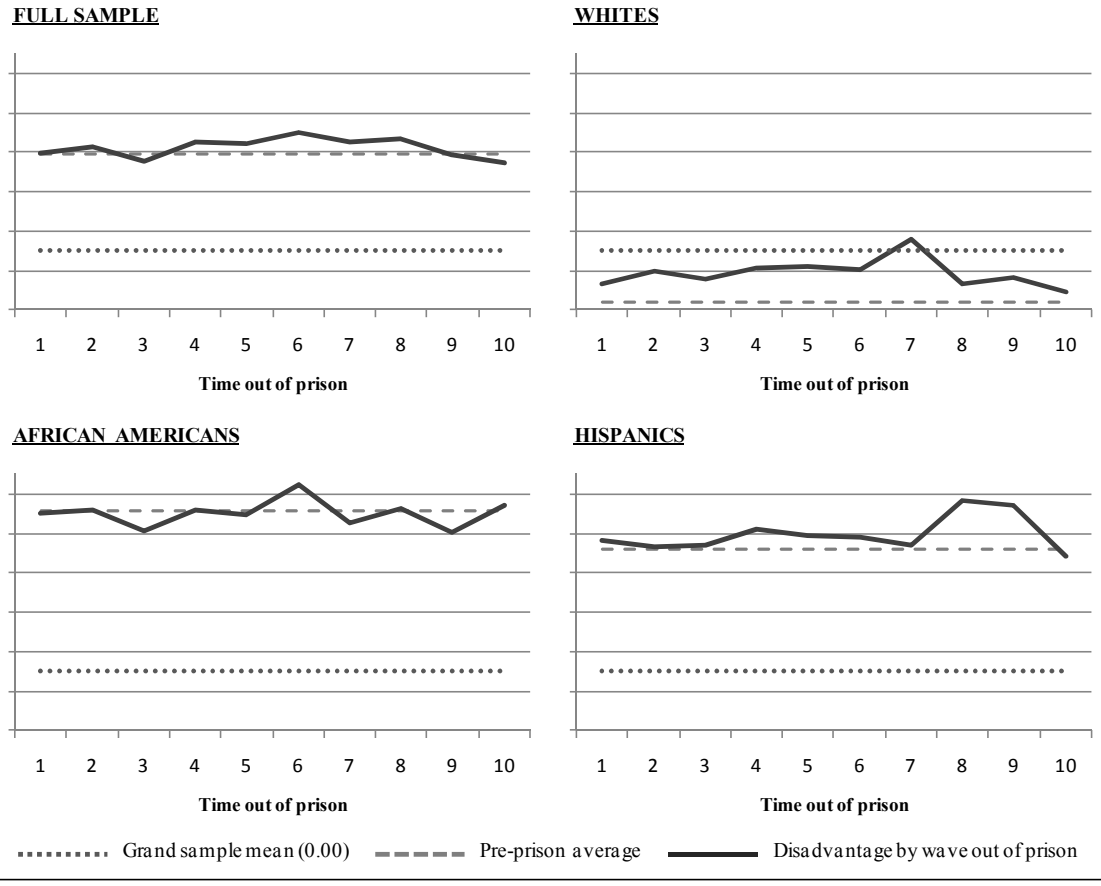
a - Models limited to first time out of prison

* p<.05; ** p<.01; *** p<.001; Standard errors in parentheses

All models control for education, number of moves, family poverty staus, homeowner, and residence in public housing.

FIGURES

Figure 1. Neighborhood Disadvantage Levels by time out of prison; full sample and by race/ethnicity.



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