Concentration Effects:

A Natural Experiment of Neighborhood Change

David S. Kirk

University of Texas at Austin

March 1, 2011

Concentration Effects: A Natural Experiment of Neighborhood Change

Since the publication of *The Truly Disadvantaged* (Wilson 1987), considerable research attention has been devoted to understanding the causes and consequences of *concentration effects*, particularly poverty. The concentration of poverty in the United States during the 1970s and 1980s was purported to have devastating effects on economic self-sufficiency, education, crime, physical and mental health, and drug use, thereby creating a spiral of neighborhood decay. One reason for the rise of inner-city social problems was the out-migration of middle class families to the suburbs and the resulting social isolation of inner-city residents who remained. Without the social buffer of middle-class residents, neighborhood institutions faltered and employment opportunities became even more scarce. Whether this social isolation that Wilson describes helped create a criminal class, or whether the outmigration of the middle-class meant that inner-cities simply became proportionally more occupied by the criminally inclined, the result was that rates of crime and drug use increased.

At the same time as crime was increasing, criminal justice policy took a punitive turn in the United States, ushered in by the so-called War on Drugs of the Nixon and Reagan eras. With the War on Drugs came a massive increase in criminalization of behavior and an unprecedented rise in the number of individuals in prison. From 1925 to the mid-1970s, the incarceration rate in the United States hovered at a relatively consistent level of 100 per 100,000 residents (Western 2006). The rate now is roughly 500 per 100,000 residents for individuals incarcerated in prison. The number increases to 750 per 100,000 if jail inmates are included, with over 2 million individuals incarcerated at any point in time in the United States.

An underappreciated fact of this era of mass incarceration is that most prisoners are released from incarceration. While the War on Drugs and "tough on crime" sentencing policies of the 1980s and 1990s facilitated the mass removal of criminals from many U.S. metropolitan neighborhoods, the most recent decade has been characterized by a growing number of individuals returning to these very same neighborhoods following their exit from prison. In 1998, roughly 560,000 prisoners were released from state and federal prison back into the community. By 2008, that number had reached 735,000 (Bureau of Justice Statistics 2002; Sabol, West, and Cooper 2009). Ex-prisoners tend to be geographically concentrated within resource deprived sections of metropolitan areas, often returning to the same neighborhoods where they resided prior to incarceration. For instance, research by the Urban Institute reveals that over half of prisoners released from Illinois prisons return to the city of Chicago, and one-third of those returning to Chicago are concentrated in just six community areas (La Vigne et al. 2003). Thus, the massive rise in the number of returning prisoners combined with the geographic clustering of these ex-prisoners means that select urban communities have literally become inundated with individuals who have served time behind bars.

A likely consequence of this concentration of prisoner reentry is recidivism—roughly two-thirds of released prisoners are rearrested within three years of release and half

return to prison (Langan and Levin 2002).[1] The routine exposure to criminogenic influences and criminal opportunities portends a bleak future for individuals who return to neighborhoods with numerous other ex-prisoners following incarceration. For instance, to the extent that a distrust and cynicism of the criminal justice system permeates the culture of neighborhoods inhabited by numerous ex-prisoners, it becomes far less likely that individuals will comply with the law or cooperate with the police (Kirk and Matsuda 2011; Kirk and Papachristos 2011). In this sense, cynicism of the law may be contagious; adding more former prisoners to a neighborhood enhances the contagious spread of cynicism. Decreasing the number of ex-prisoners in a neighborhood may dilute this cynicism and therefore reduce the likelihood of criminality among neighborhood residents.

The reasons why ex-prisoners concentrate into select neighborhoods are many, and include a lack of housing options as well as social ties to the neighborhood. Yet another reason for the clustering of ex- prisoners is the fact that most states require parolees to return to their county of conviction or last residence when they exit prison (National Research Council 2007). Such policies and practices, while designed to enhance public safety, may in fact undermine it. Put simply, the alarming recidivism rates in the United States may be a consequence of the fact that many individuals coming out of prison end up residing in the same neighborhoods as other former felons.

But what if there was a different policy and a different geographic distribution of ex-prisoners? If instead of concentrating ex-prisoners in geographic space, what would happen to recidivism rates if ex-prisoners were dispersed across space? This study seeks to answer these questions by exploiting a natural experiment—Hurricane Katrina—to examine how neighborhood changes in the concentration of parolees affects parolee re-incarceration rates.

The Context
In August 2005, Hurricane Katrina ravaged the Louisiana Gulf Coast, effectively damaging a vast majority of the housing stock in the New Orleans metropolitan area. In Orleans Parish, 71.5 percent of housing units suffered some damage following Hurricane Katrina, with 56 percent of housing units significantly damaged (U.S. Department of Housing and Urban Development 2006).[2] The extent of housing unit destruction was similar in adjacent parishes. In both St. Bernard Parish and Plaquemines Parish 80 percent of housing units were damaged, while 70 percent were damaged in St. Tammany Parish and 53 percent were damaged in Jefferson Parish. The consequence of property destruction was a massive depopulation of the New Orleans metropolitan area. For instance, the population of Orleans Parish as of July 2005 was 437,186, but declined to 158,353 by January 2006 (U.S. Census 2006). In St. Bernard Parish, the population declined from roughly 65,000 to 3,000 over the same time period. Repopulation to the region has been substantial, though not completely to pre-Katrina levels. As of July 2006, the population of Orleans Parish stood at 208,548, and increased to 288,113 by July 2007 (U.S. Census 2009). As of July 2009, the

---

[1] "Prisoner reentry" refers to the process of leaving prison and returning to the community (National Research Council 2007).
[2] Parishes are unique to Louisiana but are equivalent to counties.

population of Orleans Parish totaled almost 355,000. Thus, neighborhood change in the Louisiana Gulf Coast region since Hurricane Katrina has been substantial.

One consequence of the property destruction from Hurricane Katrina has been a dispersion of Louisiana parolees post-Katrina away from select New Orleans metropolitan neighborhoods to other residential locations throughout the state (Kirk 2009). This pattern developed because parolees released from prison post-Katrina had substantially reduced residential choices in New Orleans relative to their pre-Katrina counterparts. Subsequently, however, many neighborhoods have redeveloped and many individuals, including parolees, have returned to their home neighborhoods. The changes in residential patterns resulting from this natural disaster serve as a counterfactual for investigating what would happen to re-incarceration rates if ex-prisoners were dispersed across space instead of clustered into select urban neighborhoods.

With these patterns of residential migration in mind, I <u>hypothesize</u> that the de-concentration of prisoner reentry in a neighborhood leads to lower rates of re-incarceration (i.e., among those parolees still in the neighborhood). Here I define the concentration of prisoner reentry as the number of parolees per 1,000 residents in a census tract, and de-concentration of prisoner reentry refers to a decline in the concentration of parolees over time. Conversely, I <u>hypothesize</u> that neighborhoods experiencing an increased concentration of prisoner reentry will have increasing rates of re-incarceration. The number of recidivists will necessarily increase as the number of parolees in a tract increase, but the focus in this study is on the <u>rate</u> of re-incarceration.

Research Design
Sample and Data

This study draws upon data on parolees from the Louisiana Department of Public Safety & Corrections (DPS&C), including information on re-incarceration as well as address of residence following incarceration. I use address information to assign parolees to their respective census tracts. This census tract assignment represents where the parolee resided immediately upon release from prison. The analytic sample is drawn from prisoners released from Louisiana correctional facilities in two separate time periods. A first cohort is comprised of all releases from a Louisiana prison to parole supervision immediately following Hurricane Katrina (i.e., from September 2005 to February 2006). A second cohort consists of all releases onto parole supervision one-year later, between September 2006 and February 2007. Assuming the macro-level shock from Hurricane Katrina affected re-incarceration in unforeseen or unmeasured ways, I attempt to control for this shock by only using cohorts released post-Katrina— i.e., one cohort released 2005-2006 and a second released 2006-2007. An assumption with this analysis is that neighborhood concentrations of parolees changed over the course of the year as neighborhoods in the New Orleans metropolitan area redeveloped from the hurricane.[3] With the redevelopment of neighborhoods, the parole population began to re-concentrate in certain sections of New Orleans.

---

[3] Research findings based on data from the Current Population Survey reveal that well over 90 percent of residents in high-damage areas such as Orleans, Plaquemines, and St. Bernard parishes evacuated during Hurricane Katrina while roughly 80 percent of residents from relatively less impacted areas

In addition to the Louisiana DPS&C data, I draw upon census tract and parish-level data from the following sources: the U.S. Census, the Louisiana Department of Labor, ESRI, Geolytics, and the Supreme Court of Louisiana. These data are used to control for observed differences in social context across time periods to isolate the specific effect of parolee concentration on re-incarceration rates. Contextual variables at the tract-level include concentrated disadvantage, proportion renters, and population density. Variables at the parish-level include average adjusted weekly wages, the unemployment rate, fair market rent, and the average caseload per judge in the parish criminal court.

Methods

Conceptually, the empirical analysis to follow is based on a comparison of the rate of re-incarceration between otherwise equivalent neighborhoods where treated neighborhoods are characterized by a concentration of ex-prisoners and control neighborhoods are characterized by a de-concentration of ex-prisoners. To estimate the effect of the concentration of prisoner reentry on re-incarceration rates, I use a difference-in-differences estimation strategy (see Card and Krueger 1994), and capitalize on two sources of variation: (1) <u>between</u> neighborhood differences in the concentration of parolees (i.e., where the concentration of parole is the treatment condition), and (2) <u>within</u> neighborhood change over time in the concentration of parolees. In essence, I compare *changes* in re-incarceration in treated neighborhoods between 2005-06 and 2006-07 $\left(Y_1^T - Y_0^T\right)$ to *changes* in re-incarceration in control neighborhoods $\left(Y_1^C - Y_0^C\right)$, where the superscripts identify the treatment status and the subscripts denote the time period. In this case, the control group reveals what would have happened to the treatment group—in terms of changes in re-incarceration—in the absence of treatment. Such an approach is beneficial because a comparison of control and treated neighborhoods at one time point may not yield valid inferences about the effect of the concentration of prisoner reentry because control and treated neighborhoods may differ on other characteristics besides the concentration of parolees (i.e., unobservable heterogeneity across neighborhoods). Moreover, a pre/post comparison of re-incarceration within the same neighborhood would be inadequate given that other changes surely occurred to the neighborhood during the observation period in addition to changes in the concentration of parolees (i.e., unobservable heterogeneity across time). The assumption with the difference-in-differences approach is that the change in the re-incarceration rate would be the same across treated and

---

(Jefferson, Lafourche, St. Charles, St. John the Baptist, and St. Tammany parishes) evacuated (Groen and Polivka 2010). During the first six months following Hurricane Katrina, approximately 80 percent of residents in low-damage areas returned to their same origin county while 30 percent returned in high-damage areas. By October 2006 (13 months after the hurricane), slightly more than 80 percent of residents had returned to low-damage areas while the percentage of returning residents increased to approximately 55 percent in high-damage areas. Thus, in affected areas, particularly high-damage areas, the concentration of parolees dispersed significantly following Katrina, and became relatively more concentrated in areas minimally affected by property destruction (e.g., Baton Rouge). As the New Orleans metropolitan area redeveloped and residents moved back, the concentration of parolees in unaffected places like Baton Rouge began to decline to previous levels.

control neighborhoods if both received the same change over time in the concentration of parolees.

To undertake a difference-in-differences model, I pool the cross-sections of data (i.e., 2005-06 and 2006-07 observations) for census tracts in Louisiana. Because my interest is in the effect of concentration, I exclude tracts with very few parolees (i.e., less than five).[4] Equation (1) specifies the model:

$$Y_j = \beta_0 + \beta_1 X_{1j} + \beta_2 X_{2j} + \beta_3 Year0607_j + \beta_4 Concentration_j + \delta(Year0607 * Concentration_j) + \varepsilon_j$$

(1)

where

Y_j is the one-year re-incarceration rate in census tract j (i.e., the proportion of parolees from a given cohort who were re-incarcerated within one-year following release from prison);

X_1 is a vector of census tract characteristics used to account for differences in tract socio-economic conditions;

X_2 is a vector of parish characteristics used to account for differences in parish socio-economic conditions and criminal justice practices;

Year0607 is a dummy variable indicating whether the observation occurred during 2006-2007 (=1) or 2005-2006 (=0);

Concentration indicates the extent of the concentration of parolees in a census tract (i.e., the number of parolees per 1,000 residents in a tract). In this case, the measure of concentration is analogous to a treatment *dosage*—i.e., the concentration of parolees in a tract is a dose—and the model reveals whether the level of dosage affects the re-incarceration rate.

In Equation (1), β_3 represents the time trend in re-incarceration common across tracts and β_4 accounts for any systematic differences between census tracts with differing levels of parolee concentration (e.g., social disorder or access to social services and drug treatment resources). The coefficient δ is the key parameter of interest, and identifies the effect of the concentration of parolees on re-incarceration. It reveals the effect of the increasing concentration of parolees in Louisiana between the 2005-06 and 2006-07 time periods on tract re-incarceration rates. In equation form:

$$\hat{\delta} = \left(\left[\overline{Y}_1^T \right] - \left[\overline{Y}_0^T \right] \right) - \left(\left[\overline{Y}_1^C \right] - \left[\overline{Y}_0^C \right] \right).$$

Findings

Table 1 presents results from the estimation of Equation (1). The first model is estimated without tract and parish controls while the second model includes controls. The intercept value in Model 1 reveals that the average one-year re-incarceration rate is 0.208. To facilitate interpretation of the intercept, the concentration of parolee variable is centered on one, so the intercept is interpreted as the re-incarceration rate in a tract with a concentration of 1 parolee per 1,000 residents.

[TABLE 1 ABOUT HERE]

---

[4] I also conducted separate analyses excluding tracts with fewer than 10 or 15 parolees respectively, and find that my inferences are robust to which cutoff I use to exclude tracts with very few parolees.

Model 2 adds controls for tract and parish-level factors designed to account for systematic differences between tracts besides the concentration of parolees. Tract and parish covariates are grand-mean centered so that the intercept is interpreted as the one year re-incarceration rate in an otherwise average census tract with a concentration of 1 parolee per 1,000 residents. As expected, the tract re-incarceration rate is positively related to concentrated disadvantaged, and negatively related to wages. Thus, socioeconomic context has a substantial influence on the likelihood that an ex-prisoner ultimately returns to prison because of a new crime or parole violation.

The parameter estimate in Model 2 for the interaction between parolee concentration and the time period (0.006) indicates that if the concentration of parolees increased by one parolee per 1,000 residents, the re-incarceration rate would increase by 0.006. Even after controlling for key correlates of re-incarceration, including neighborhood disadvantage and wages, this increase is statistically significant.

To facilitate the interpretation of this finding, the case of Baton Rouge serves as a useful example. Prior research reveals that because of Hurricane Katrina, many parolees who would have moved back to the New Orleans metropolitan following release from prison instead moved to Baton Rouge (Kirk 2009). Downtown Baton Rouge is home to the River Center, a large homeless shelter which housed numerous individuals in the aftermath of the hurricane. Many homeless ex-offenders who normally would have sought shelter in New Orleans instead took up residence at the River Center in Baton Rouge. Thus, downtown Baton Rouge had an influx of parolees immediately following Hurricane Katrina. The number of new parolees increased from 4 per 1,000 residents in 2004, to 15 per 1,000 residents right after the hurricane. By the 2006-2007 time period, the concentration of parolees had returned to approximately 4 per 1,000. Based on statistical models presented in Table 1, we would expect 22.6 percent of parolees released in 2004 to be back in prison within a single year (holding all other variables at their means).[5] However, because of the effects of concentrating ex-prisoners into the same tract, we would expect the re-incarceration rate to rise to nearly 29 percent in the period immediately following the hurricane. Then, as the concentration of parolees returned to 4 per 1,000 residents in 2007, we would expect that the re-incarceration rate would return to roughly 22.6 percent. Thus, as hypothesized, concentration effects undermine the ability of parolees to avoid further incarceration. Releasing large numbers of ex-offenders into the same neighborhoods adversely affects the very public safety that criminal justice policies in the United States were designed to protect.

In conclusion, the clustering of ex-offenders in the same neighborhoods is partly a product of the fact that most states require parolees to return to their county of conviction or last residence when they exit prison. Such policies and practices, while designed to enhance public safety, may in fact undermine it. Results presented in this study suggest that the alarming recidivism rates in the United States are a consequence of the fact that many individuals coming out of prison end up residing in the same neighborhoods as other former felons. To reduce recidivism, an alternative policy is necessary, one which disperses the parole population instead of concentrating it into select urban neighborhoods.

---

[5] This is computed as follows: [(.209 + (4-1)*.006) = .226].

Table 1. Difference-in-Differences Estimates of Re-Incarceration

	Model 1			Model 2		
	Robust			Robust		
	Coef.	Std. Err.		Coef.	Std. Err.	
Intercept	0.208	(0.006)	***	0.209	(0.006)	***
Concentration	0.002	(0.001)		0.002	(0.001)	
Year 2006-07 (vs. 2005-06)	0.054	(0.013)	***	0.053	(0.017)	***
Concentration * Year 2006-07	0.006	(0.003)	*	0.006	(0.003)	*
Tract Disadvantage				0.030	(0.009)	***
Proportion Renters				-0.018	(0.049)	
Tract Population Density				-0.001	(0.003)	
Parish Unemployment				-0.013	(0.295)	
Avg. Weekly Wage				-0.017	(0.007)	**
Fair Market Rent				0.002	(0.005)	
Judge Caseloads				-0.001	(0.012)	

Notes: * p<=0.05;   ** p<=0.01; *** p<=0.001 (one-tailed test).

The coefficients and standard errors for Tract Population Density and Judge Caseloads are multiplied by 1,000. The coefficients and standard errors for Parish Unemployment, Avg. Weekly Wage, and Fair Market Rent are multiplied by 100.

References

Bureau of Justice Statistics. 2002. *Correctional Populations in the United States, 1998 - Statistical Tables*. Washington, DC: U.S. Department of Justice.

Card, David, and Alan B. Krueger. 1994. "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania." *American Economic Review* 84: 772-84.

Groen, Jeffrey A., and Anne E. Polivka. 2010. "Going Home After Hurricane Katrina: Determinants of Return Migration and Changes in Affected Areas." *Demography* 47:821-44.

Kirk, David S. 2009. "A Natural Experiment on Residential Change and Recidivism: Lessons from Hurricane Katrina." *American Sociological Review* 74:484-505.

Kirk, David S., and Mauri Matsuda. 2011. "Legal Cynicism, Collective Efficacy, and the Ecology of Arrest." *Criminology* 49(2). Forthcoming.

Kirk, David S., and Andrew V. Papachristos. 2011. "Cultural Mechanisms and the Persistence of Neighborhood Violence." *American Journal of Sociology* 116(4). Forthcoming.

La Vigne, Nancy G., Cynthia A. Mamalian, Jeremy Travis, and Christy Visher. 2003. *A Portrait of Prisoner Reentry in Illinois*. Washington, DC: Urban Institute.

Langan, Patrick A., and David J. Levin. 2002. *Recidivism of Prisoners Released in 1994*. Washington, DC: Bureau of Justice Statistics.

National Research Council. 2007. *Parole, Desistance from Crime, and Community Integration.* Committee on Community Supervision and Desistance from Crime. Committee on Law and Justice, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

Sabol, William J., Heather C. West, and Matthew Cooper. 2009. *Prisoners in 2008*. Bureau of Justice Statistics Bulletin. Washington, DC: U.S. Department of Justice.

U.S. Department of Housing and Urban Development. 2006. Current Housing Unit Damage Estimates: Hurricanes Katrina, Rita, and Wilma. Washington, DC: U.S. Department of Housing and Urban Development. Retrieved December 8, 2006 (http://www.huduser.org/publications/destech/GulfCoast_HsngDmgEst.html).

U.S. Census. 2006. Special Population Estimates for Impacted Counties in the Gulf Coast Area. Retrieved September 16, 2010 (http://www.census.gov/newsroom/emergencies/additional/impacted_gulf_estimates.html).

U.S. Census. 2009. County population change: April 1, 2000 to July 1, 2009 (CO-EST2009-popchg2000-2009). Retrieved September 16, 2010. (http://www.census.gov/popest/counties/files/CO-EST2009-POPCHG2000_2009-22.csv).

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

Wilson, William J. 1987. *The Truly Disadvantaged: the Inner City, the Underclass, and Public Policy*. Chicago: University of Chicago Press.