Optimizing Residential Segregation and Urban Crime

Abstract

Research consistently finds that racially segregated communities experience higher levels of crime and social disorganization. Yet the 1990s crime decline was unaccompanied by a notable change in the residential segregation levels of many cities between 1990 and 2000, suggesting a possible decoupling of the relationship between segregation and crime. In this paper we investigate when, whether, and how racial segregation structures disadvantage among minority communities. Our analysis will optimize residential segregation and homicide rates by finding the maximum level of racial integration (or isolation) that minimizes (or maximizes) homicide between 1980 and 2000. Segregation thresholds are identified to illuminate "tipping points" in homicide rates, and segregation inertia/stability during this period is used to test causal arguments that homicide (or crime more generally) is caused by growing inequality in residential segregation.

Research Objectives and Significance

What is the relationship between segregation and crime? Are there optimum levels of racial segregation (or racial integration) that minimize crime, and does this optimal level vary over time? To date, researchers have not given much attention to these questions and consequently overlook the possibility that residential segregation may not cause crime if levels of racial segregation remain stagnant while crime rates decline. To elaborate more clearly, a plethora of research finds that racially segregated, non-white neighborhoods have higher crime rates than white communities (Krivo and Peterson 1996; 2000; Krivo, Peterson, Rizzo, and Reynolds 1998; Peterson and Krivo 1993; Shihadeh and Flynn 1996). Racial isolation pervades many urban areas (Massey and Denton 1993; 1989; Massey 1990; Massey, Condran, and Denton 1987), resulting in high levels of poverty, depression, stress, and negative health outcomes among residents (Massey 1996; Ross 2000; Ross and Mirowsky 2001; Aneshensel and Sucoff 1996). The social and health tolls racial segregation exert on community members results in perceptions of powerlessness, mistrust, and local neighborhood detachment (Geis and Ross 1988; Ross, Mirowsky, and Pribesh 2001; Woldoff 2002; Warner and Rountree 1997). Fear of crime among whites exacerbates racial segregation by ensuring that their residential proximity to blacks and Hispanics is kept at a distance (Skogan 1995; Chiricos, McEntire, and Gertz 2001; Emerson, Chai, and Yancey 2001; Taylor and Covington 1993).

Despite extant literature on the effects of racial segregation on psychological well-being, little research has focused on understanding whether segregation is the cause or consequence of urban crime. Economic deprivation and social disorganization that stem partly from segregation have been posited as explanations of crime (Wilson 1987), but the degree to which crime varies over time cannot be explained away on these grounds alone because crime declined during periods of disadvantage in many cities. Research relies on cross-sectional data for a single year and assumes that increasing levels of segregation cause higher crime rates. However, this assumption has not been subject to empirical scrutiny in a rigorous framework.

Furthermore, some research examining the relationship between segregation and crime or related constructions (e.g., racial composition) suggests that the causal relationship could operate partly or wholly in the reverse direction with crime affecting levels of segregation. Cullen and Levitt (1999) argue that the causal effect of crime is to reduce city population and to exacerbate segregation, with more educated households, and those with children, exiting the central city but remaining in the Metropolitan Statistical Area (MSA). Liska and Bellair (1995) and Liska et al. (1998) also find that violent crime affects the racial composition of cities and suburbs. Liska et al. (1998) conclude that the causal effects of racial composition and crime are approximately equal and exchangeable

(i.e., crime leads to segregation and segregation leads to crime). This, in part, supports general findings that racial segregation increases crime rates. Clearly better empirical research is needed that helps sort out the alternative theoretical relationships between segregation and crime.

Yet conducting such research poses a challenge because crime rates are an endogenous factor in segregation. Previous model specifications make use of crosslag methods, whereby the observed level of crime in the current period is a result of the racial composition and other predictors from earlier periods *and* vice versa (Liska and Bellair 1995; Liska, Logan, and Bellair 1998). While such an approach informs researchers about the temporal delays of predictors on a particular outcome (in this case, racial segregation and crime), this framework is generally outside the purview of methods for counterfactual inference. To counter this problem, recent work in causal studies of crime use lag models *within* experimental designs (Donohue and Levitt 2001; 2004; Joyce 2004a;b; Foote and Goetz 2005; Levitt 2001; Ananat, Gruber, Levine, and Staiger 2006; Johnson and Raphael 2005). In such cases, lagged variables are part of the effect on an outcome, but there are also identifiable treatment and control groups or there is an exogenous shock or policy intervention that allows for a "natural experiment" (Stock and Watson 2003; Donohue and Levitt 2004; Joyce 2004a;b; Levitt 2001). Here we propose to undertake research that addresses these limitations by exploiting the precipitous and unexpected decline in crime during the mid to late 1990s. This period presents researchers with a unique opportunity to understand whether the decline in crime was caused by segregation stabilization or slight gains racial integration. The observed break from previous trends in crime represents exogenous variation due to the fact that some cities experienced changes in their levels of racial segregation while others did not. By identifying cities that did not experience changes in their segregation measures as the counterfactual for cities that experienced change, we will be able to net out the effect of segregation on crime within a true causal framework. This approach has two benefits. First, by holding constant the level of segregation, any change in crime rates would not be due to increases beyond the initial level of segregation. When increases in segregation cease, then fluctuations in crime rates would not be due to changes in segregation levels. This would be evidence that segregation does not *cause* the waxing or waning of crime rates. The major implication would be that crime rates *cause* segregation or have no effect.

Going beyond establishing causal direction, we will illuminate the threshold effects whereby certain levels of segregation could be responsible for the exacerbation or attenuation of crime rates in cities. Even if segregation does not cause crime, it is possible that below certain segregation thresholds, crime varies less markedly. By examining two decades of data, we can situate various levels of segregation in a historical context to show how certain segregation thresholds impact crime rates. Threshold effects have been shown to explain differences in the processes that generate white and black rates of criminal violence (Krivo and Peterson 2000) and the minimum amount of segregation that would be expected in a particular cities (Krivo and Kaufman 1999). In this project we are interested in ascertaining the direction of causality and finding the maximum amount of integration (or the minimal amount of segregation) that minimizes crime. Analyzing deviations from this integration threshold provides context in understanding how changes in segregation impact crime rates in cities.

Proposed Research Methods

To examine the nature of the relationship between crime and racial segregation, we rely upon an innovative methodological technique: a synthetic control method. This method was developed to assess counterfactuals in empirical economics and has been applied to study whether tobacco legislation caused lower per-capita cigarette consumption in California (Abadie et al. 2007) and

the economic costs of conflict/terrorism in the Basque Country (Abadie and Gardeazabal 2003). Although this method has not been used in analyses of segregation and crime, it is applicable. The synthetic control method allows researchers to make causal inference in comparative case studies with aggregate data, even if the data contain only a single unit (a state, city, country, etc.) that is exposed to an event or intervention (Abadie, Diamond, and Hainmueller 2007; Abadie and Gardeazabal 2003). The idea behind this method is that for cities with unaltered segregation indices, we can construct comparable synthetic cities. The synthetic cities are the weighted average of potential control cities, with weights chosen so that the resulting synthetic cities produce the closest outcome trajectory of the actual cities prior to the stabilization of the segregation measures. The potential control cities, also known as the donor pool, will remain untreated (i.e., their segregation measures will vary) over the post-treatment period. Abadie et al. (2007) argue that large sample inferential techniques (i.e., OLS methods) are not well suited for comparative case studies (e.g., studying segregation and crime) because the number of comparison groups and periods are small. The synthetic control method, however, allows researchers to examine the causal effect in comparative case studies based on falsification and permutation inference. In the context of this project, the event is the stagnant segregation measure, and by using the synthetic control approach, a combination of cities that have varying levels of segregation over time provide a better comparison for the a city (or cities) where segregation has not changed much. Put another way, we are not matching based on a single unit but on a combination of weighted units.

The synthetic control method contrasts with other methods for causal and counterfactual inference (e.g., propensity score matching methods, instrumental variables, and two-stage least squares) by using the unit exposed to the treatment as both the treatment and control effect. Research indicates that two-stage least squares and propensity score matching methods are often contentious methodological approaches because of the parameterization of the first stage equation and for failure to identify extreme counterfactuals. Scholars have shown that the inclusion or exclusion of some first stage parameters can lead to erroneous conclusions and that extreme counterfactuals can change substantive conclusions (King and Zeng 2006b;a; King 1991; Imai, King, and Stuart 2006; Ho, Imai, King, and Stuart 2005). By applying the synthetic control method, however, we develop a model that overcomes these limitations, which will help scholars understand the nature of the causal connection between segregation and crime.

Data for our project will be drawn from multiple sources. My project will focus on central cities that have at least 100,000 residents and an African-American population of 5,000 or more in order to construct reliable race-specific crime rates (Krivo and Peterson 2000; Peterson and Krivo 1993) for the 1980-2000 period. We use data from the Uniform Crime Reports (UCR) and the Supplementary Homicide Reports (SHR) to obtain crime rates and race-specific homicide rates. Additionally, our independent variables (standard demographic covariates and segregation indices) will be at the city level and will come from the Census Bureau. To measure segregation, we use the index of dissimilarity (D)—a measure of the evenness in how two groups are distributed across census tracts (Krivo and Peterson 2000; Peterson and Krivo 1993). Segregation indices for cities are available from the Mumford Center at the University of Albany. We will also include socioeconomic measures (unemployment, home ownership percentages, etc.) as additional controls.

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