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LONGITUDINAL ASSOCIATIONS BETWEEN DIMENSIONS OF AFRICAN AMERICAN RESIDENTIAL SEGREGATION AND ARREST WITHIN U.S. METROPOLITAN AREAS, 1980-2000

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Abstract:

While much research incorporates measures of residential segregation in macro-level research, surprisingly little work has examined the relationship between dimensions of segregation to changes in arrest rates within metropolitan areas. Using data from the U.S. Census and FBI Arrest reports, this paper analyzes how Massey and Denton's (1988, 1994) five dimensions of residential segregation influence total, violent, and property arrest rates within a panel of metropolitan areas (MAs). Additionally, by extending this analysis to explain race-specific arrest rates over time, this study expands existing research using theories of racial threat and concentrated deprivation that link African American residential segregation and arrest rates. Results suggest that significant dimensions of segregation include evenness in distribution across census tracts, exposure to non-African Americans, and concentration within adjoining census tracts. Analysis of arrest rates also suggests that concentrated disadvantage explains arrest patterns over time within MAs.

Introduction

Over the last century, the association between African American residential segregation and crime/arrest trends in cities has been extensively documented. With legal segregation beginning in the 1890s, classical studies such as Du Bois (1996 [1899]), Myrdal (1945), and Drake and Cayton (1993 [1945]) have associated the segregation of African Americans with increased crime and arrest. From the Civil Rights era to present, African American residential segregation has remained strongly correlated with both crime and arrest (Blau and Blau 1982; Eitle 2009; Massey and Denton 1994; Parker, Stolts, and Rice 2005). To explain these macro associations, theories of concentrated disadvantage (such as Sampson and Wilson [1995]) and/or subjugation of blacks (i.e., variations of Blalock's [1967] 'racial threat' hypothesis) have been extensively utilized.

Yet, despite this extensive body of research, a number of limitations remain. Almost all studies have been cross-sectional, raising issues of time ordering and a lack of longitudinal analysis that would provide better evidence that changes in residential segregation predict changes in arrest over time. Despite theoretical links and availability of measures of segregation available from the U.S. Census Bureau, relatively few studies examine longitudinal relationships between racial segregation and arrest at the macro-level (Lafree, O'Brien, and Baumer 2006). Type of arrests analyzed vary significantly across studies, with much analysis on rare events such as homicide (Blau and Blau 1982 Eitle 2009), while other studies focus on property or violent crimes (Krivo and Peterson 1996; Parker et al. 2005). Arrests may also compromise the total arrests within a metropolitan area, or rather reflect a specific racial group. The lack of longitudinal data and full utilization of available methods and data greatly limit the empirical evidence for the theoretical underpinnings of why African American segregation may explain arrest.

In this paper, I address these limitations and construct a panel of 200 U.S. metropolitan areas using FBI Uniform Crime Reports, measures of segregation for metropolitan areas computed by Iceland, et al. (2002), and Integrated Public-Use Micro-Census Series (IPUMS) data. These data make possible some of the first longitudinal analyses of how African American residential segregation impacts arrest rates within U.S. metropolitan areas.

Drawing upon the five dimensions of segregation popularized by Massey and Denton's (1994) *American Apartheid*, I also examine how changes in dimensions of African American segregation (evenness, exposure, clustering, centralization, and concentration) impact arrest rates over time. While most existing studies of residential segregation use a crude measure of the proportion of blacks residing within a metropolitan area (Krivo and Peterson 1996; Eitle 2009), more detailed studies of residential segregation have incorporated measures of the residential dissimilarity and social isolation of African Americans (Krivo and Peterson 1996; Ousey and Lee 2008). One recent study by Eitle (2009), has examined the relationship between Massey and Denton's five dimensions of segregation on homicide for a cross-section of metropolitan areas; however, Eitle's analysis did not make use of available panel data for the dimensions of African American residential segregation in predicting arrest.

By analyzing longitudinal data, this research more rigorously tests hypotheses drawn form the concentrated disadvantage and racial threat theories regarding how changes in segregation impact arrest rates over time. While a few studies, such as Kent and Jacobs (2005) study on racial threat and police strength have incorporated panel data, longitudinal studies have not examined how theories of racial threat and concentrated disadvantage link African American residential segregation and arrest at the metropolitan level. By addressing issues of time ordering and examining within-metropolitan area change, results of this analysis, hence, help to extend prior work on racial threat and concentrated disadvantage.

Background

The association between black residential segregation and arrest has been generally viewed as arising from (i) crime associated with dire poverty and (ii) the social control of blacks. Over a century ago, Du Bois (1996 [1899]) was among one of the first social scientists to link disparate treatment and poverty of African Americans with crime and arrest. In reviewing newspaper reports of crime, city arrest records, and blacks incarcerated in an Eastern State Penitentiary, Du Bois noted, "the environment in which a Negro finds himself--the world of custom and thought in which he must live and work, the physical surrounding of house and home and ward, the moral encouragements and discouragements which he encounters" as being "greater in influence" than the issues arising from slavery and migration from the American South (284).

In the last three decades, much research within criminology has focused on the link between segregation and arrest as: 1) a consequence of numerous, overlapping forms of inequality, or 'concentrated disadvantage,' for African Americans residing in inner cities and 2) a consequence of social control of African Americans, who collectively pose a "racial threat" to whites in competing for economic and social resources. In the discussion that follows, I briefly outline the theoretical frame for each body of research, focusing on how each relates to segregation and arrest.

Segregation and Concentrated Disadvantage

One theoretical explanation for the association of African American residential segregation and arrest is that African American residential segregation serves as a source for geospatially concentrated African American disadvantage and crime[1]. Originating with work by

[1] For purposes of studying concentrated disadvantage, I assume that arrest rates serve as a proxy for crime rates. Recent work by Hipp (2007a) has argued that arrest may serve as a 'lower bound' for estimating crime rates in geographical areas such as neighborhoods. While official measures of crime are known to

Shaw and McKay (1942), concentrated disadvantage occurs when pervasive poverty, social disorganization, and inequality create an environment conducive to crime. Recent studies suggest that historic segregation of blacks into ghettoes, formed in the early twentieth century, continues with highly concentrated populations of blacks in central cities residing apart from employment, education, and social structures that act as persistent barriers to social mobility (Alba and Nee 2003; Lieberson 1980; Massey and Denton 1994; McLeod 1995; Mouw 2000; Waldinger 1996). In this vein, work by Wilson (1987, 1996) and Anderson (1990, 1999) located African Americans in similar ghetto environments where chronic, pervasive lack of jobs and poverty create conditions conducive to crime and violence.

The work of Sampson and Wilson (1995) provides a theoretical frame for explicitly linking residential segregation to crime. Sampson and Wilson (1995) theorized that African Americans differentially experience much greater levels of social isolation and concentration that result, via structural and cultural adaptations, in increased levels of violence relative to whites. As a result, they suggest that the degree to which African Americans remain concentrated and isolated from mainstream society will correlate with arrest rates.

The relative roles played by segregation and concentrated disadvantage have been debated in the literature. Wilson (1996) has tended to emphasize that concentrated poverty and joblessness undermine the social organization of disadvantaged neighborhoods, thus creating an environment conducive to crime and violence. Massey and Denton, in contrast, have argued that continued racial segregation and discrimination interact with high rates of poverty to generate concentrated disadvantage in segregated African American neighborhoods. While both assert the importance of concentrated disadvantage, Massey and Denton are clear in asserting a causal role

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have bias (Thornberry and Krohn 2000), including issues such as racial profiling and selective prosecution, the aggregation of arrest data to the metropolitan area and use of fixed effect models address individual error/bias (such as failure to capture all crimes by individuals, race-based arrests by officers) and time-invariant effects (a fixed bias in racial profiling present in a department or region).

to racial residential segregation, which they have described as forming the foundation of many other forms of racial inequality.

Empirical research using concentrated disadvantage has explained how African American residential segregation correlates with arrest across MAs. Peterson and Krivo (1993) found that a measure of evenness explained African American homicide rates. Shihadeh and Flynn (1996) found that exposure (measured by the index of isolation) is a significant predictor of black homicide and arrest. Shihadeh and Maume (1997) also observed a correlation between a measure of concentration and African American homicide. Eitle (2009) examined the association of all five dimensions of segregation on homicide rates, observing that dimensions of evenness, concentration, and centralization were significant predictors.

For this paper, I extend Eitle's work to test how measures of segregation predict changes in arrest over time within MAs. These results help to better clarify the degree to which measures of residential segregation predict arrest over time when controls for poverty/inequality are added. Empirical research incorporating the theory of concentrated disadvantage suggests that evenness, exposure, and centralization are significant in predicting arrest rates. Based on the theory of cumulative advantage, the numerous overlapping sets of inequalities will make these dimensions of segregation significant when control variables for poverty and inequality are added.

It should be noted, in a large body of related research, high levels of relative racial economic inequality are associated with racial disparities in crime rates (Blau and Blau 1982; Krivo and Peterson 1996; Messner and South 1986; Rosenfeld et al. 2001; Sampson et al. 1997; Sampson et al. 2005). While this paper does not examine black-white crime disparities, the research on relative inequality suggests residential segregation may be a proxy for a high number of social and economic disadvantages that African Americans face relative to whites.

To the degree that inequality is primary and may explain the significance of residential segregation, the association of arrest rates with African American residential segregation should be mediated by variables such as the proportion of population living in poverty, an unbalanced

sex ratio (which Messner and Sampson [2005] argue is a proxy for incarceration and, by extension, the presence of stable males], and the divorce rate. Recent research by Sampson et al. (2005) has suggested that immigrants, facing less social isolation, are associated with declines in crime rates; the proportion of respondents 15-35 who are foreign-born is used to control for the effects of poor immigrants that behave differently from native U.S. citizens.

Racial Threat and Segregation

A second theoretical explanation for why African American residential segregation correlates with arrest argues that arrest serves as a mechanism for subjugating African Americans. In his classic treatise, Myrdal (1945) observed that crime served an important role in subjugating blacks by fostering stereotypes of blacks as 'violent' and 'criminal' as justifications for segregation. Contemporary racial theorists such as Roediger (1999, 2005), Collins (2005), and Bonilla-Silva (2001, 2003), similarly have argued that continued perceptions of blacks as violent and threatening perpetuate racism, even though overt discrimination is socially taboo. Wacquant (2000) and Collins (2005) have further argued that the systematic and widespread incarceration of African Americans, stemming from these perceptions, continues racial subjugation in the Post-Civil-Rights-Era.

Based on Blalock's (1967) racial threat theory, research has studied the role of arrest and incarceration as a means of whites maintaining economic and/or political control over blacks (Parker 2008; Parker, Stults, and Rice 2005; Kent and Jacobs 2005). Among African Americans, incarceration has been linked with reduced earnings (Western and Pettit 2005), involvement in political processes such as voting (Uggen, Manza, and Thompson 2006), and employment (Edleman, Holzer and Offner 2006; Pager 2007). Within cities, increased relative size of African American populations is associated with increased arrest rates (Glasier and Sacerdote 1999) and increased police strength (Jacobs 1979; Kent and Jacobs 2005). Historically, the increased

presence of black populations has been linked to laws of felon disenfranchisement (Behrams, Uggen, and Manza 2003) in states and increased criminal justice expenditures and imprisonment rates (Jacob and Carmichael 2001; Jacob and Helms 1999).

At the metropolitan level, the role of racial threat in explaining a link between residential segregation and arrest is less straightforward. To subjugate African Americans, a white majority uses police strength and economic/political dominance (Kent and Jacobs 2005; Stolzenberg, et al. 2004). Analyzing individual probabilities of arrest, Stolzenberg, D'Alessio, and Eitle (2004) find that evenness acts as an informal mechanism to reduce racial variation in the probability of arrest, while probability of arrest declines as blacks are less exposed to whites. At the metropolitan level, similar findings are also reported by Ousey and Lee (2008) for arrest rate inequality.

While incarceration may act as an additional form of social control (Jacob and Carmichael 2001), the U.S. Census counts individuals serving time in jail or prison as residing in the location where they are physically incarcerated; consequently, given the disproportionate incarceration of males, the sex ratio of communities has been proposed as a proxy for incarceration rates in communities (Messner and Sampson 2005).

In the analyses presented below, I am able to extend prior work on racial threat to test if exposure, along with Massey and Denton's other dimensions of segregation (evenness, concentration, proximity, and centralization), explain arrest patterns within a panel of metropolitan areas. By adding controls for MA police strength, African American population size, and race-specific measures of poverty, I also use controls to examine the robustness of dimensions of residential segregation on arrest. Additionally, given the hypothesized positive association between exposure and arrest of African Americans, these results test if exposure is similar in magnitude to other measures of arrest.

Measuring African American Residential Segregation

While a number of studies have examined the relationship between measures of segregation and arrest rates, current research has not systematically analyzed this relationship by type of segregation using longitudinal data. The use of panel data permits statistical modeling that examines how changes in segregation effect impact changes in arrest rates, extending cross-sectional studies of this association (Eitle 2009; Krivo and Peterson 1996) that may not be robust to time or patterns within metropolitan areas. In this section, I discuss the development and construction of measures of residential segregation I will use for analysis..

Within the social sciences, statistical measures of residential segregation date to the 1940s. One early measure was proposed by Jahn, Schmid, and Schrag (1947), who proposed four simple indices measuring 'ecological segregation' of African Americans. Various other segregation measures were proposed during the next several years; however, Duncan and Duncan's (1955) seminal paper demonstrated the mathematical relationships between many such segregation measures. Duncan and Duncan brought together a number of what would become common measures of segregation, such as indices of isolation, dissimilarity, and centralization, while observing that no single index was sufficient to quantify residential segregation. The authors also noted the correlation of segregation to a number of social issues, though not linked to crime and arrest.

While important studies such as Lieberson (1980) and Hirsch (1983) documented the emergence of residential segregation in the early twentieth century and its relationship to the African American ghettos, Massey and Denton's (1994) *American Apartheid* (using segregation measures mathematically defined in Massey and Denton [1988]) distinguished five unique components/dimensions of segregation that form the basis of contemporary research into segregation. These dimensions included:

1. **Evenness.** The degree to which African Americans are evenly distributed within the population.
2. **Exposure.** The degree to which African Americans are, on average, exposed to non-African Americans living in census tracts in a city.
3. **Concentration.** The degree to which African Americans reside within the smallest physical space of a metropolitan area (where African Americans have traditionally occupied high-density and impoverished neighborhoods).
4. **Centralization.** The degree to which individuals physically reside within the 'city centers' and not more suburban areas.
5. **Clustering.** The degree to which African Americans reside in proximity to one another within a city.

With the exception of Eitle (2009), relatively few studies have systematically examined the relationships between these five dimensions of African American residential segregation and crime or arrest. Eitle's (2009) analysis of the association between dimensions of residential segregation and homicide finds that dimensions of evenness, concentration, and centralization are all significant dimensions of African American residential segregation.

With exception of Eitle, most studies analyzing African American residential segregation and arrest have used measures of evenness (Eitle 2009; Krivo and Peterson 1993; Ousey and Lee 2008). Some research has explored dimensions of evenness and exposure (Ousey and Lee 2008; Shihadeh and Flynn 1996) and evenness and concentration (Shihadeh and Maume 1997). These studies suggest that multiple dimensions of African American residential segregation are significantly correlated with arrest rates in metropolitan areas. Nevertheless, these studies are also cross sectional studies that fail to capture change over time, do examine arrest rates by race and type of crime and do not systematically explore the dimensions of segregation outlined above.

Data and Methods

Data

Unfortunately, no single dataset exists from which panel data for cities may be constructed. Consequently, variables for analysis are pulled from a variety of sources, including the U.S. Census Bureau tabulations for residential segregation, the arrest data from FBI's Uniform Crime Reports (UCR), and the aggregated Integrated Public-Use Micro-Census Data (IPUMS). In this section, I briefly describe the data sources where variables are pulled to create a panel of MAs. Variable means and standard deviations are contained in Table 1.

[Insert Table 1 about here.]

Criminal Justice Variables

Arrest data is obtained from the FBI series on Uniform Crime Reports. Similar to practices by Baller et al. (2001) in analyzing homicide rates of counties, arrest data for three years surrounding each decennial census are averaged. By doing so, this procedure assists in reducing heterogeneity resulting from single-year discrepancies in arrests reported by law-enforcement agencies (Chilton 1982). Violent arrests represent arrest totals for index crimes of homicide [murder/manslaughter], rape, robbery, and aggravated assault. Property arrests represent arrest totals for index crimes of burglary, larceny, and motor vehicle theft. Total arrests represent the total arrests reported by law enforcement agencies. Arrest rates are generated by dividing MA arrest totals for each category by the reported MA population, then multiplied by 1000. For the census years 1980 and 1990, data are taken from Chilton and Weber (2000). Chilton and Weber's (2000) metropolitan data do not extend beyond 1995, so UCR race-specific arrest data for the census year 2000 are taken from publicly available FBI reports (U.S. Department of Justice 1999-2001).

To obtain measures of police strength, UCR data is taken from each year of the decennial census analyzed (i.e., 1980, 1990, and 2000). As a control for metropolitan area size, the number of police officers per 1000 population is used. These measures are similar to those used by Ousey and Lee (2008) and Kent and Jacobs (2005).

Population Variables.

Unfortunately, metropolitan data available from the annual U.S. Census' *County* and *City Data Book* do not permit customization of variables by age, race, and immigration status. To construct longitudinal control variables that better capture metropolitan areas, metropolitan data are generated from 5% Integrated Public-Use Micro-Census Series (IPUMS) of the United States (Ruggles et al. 2009). By aggregating a representative 5% sample of the population residing in a given metropolitan area, these data provide metropolitan and race-specific population data for the United States.

With U.S. Census data, the geospatial classification of a metropolitan area varies by census year. For the year 1980, the U.S. Census classified all metropolitan areas as a standardized metropolitan statistical area (SMSA). In 1990 and 2000, the equivalent to the SMSA was either the primary metropolitan statistical area (PMSA) or freestanding metropolitan statistical area (MSA). Metropolitan areas are defined by the census bureau as an area consisting of a large population center and adjacent communities that possess a high degree of economic and social interaction with that center. These definitions are consistent over time (Ruggles et al. 2009), allowing for repeated cross-sectional analysis.

By analyzing changes of arrest within MAs, the analyses conducted in this paper differ from the cross-sectional and between-MA analyses commonly used in regression models. Following variable guidelines suggested by Land et al. (1990), variables are selected that (1) have a correlation of less than ~0.4 and (2) minimize variables to fit components of population

structure and economic deprivation/affluence. By doing so, this analysis helps to minimize collinearity and fit the framework of fixed-effect models.

In selecting control variables, theoretically-motivated controls include: proportion of MA living in poverty, relative size of the MA and racial populations, number of police officers per thousand residents, the divorce rate, and the sex ratio. Means and standard deviations of these variables are included in Table 1.

Segregation

Measures of African American residential segregation are taken from indices created by Iceland, Weinberg, and Steinmetz (2002) for the U.S. Census Bureau. Iceland et al.'s data calculate 19 measures of segregation using 1980, 1990, and 2000 census data for freestanding and primary metropolitan statistical areas defined for the 2000 census. Metropolitan Areas (MAs) represent geographical urban areas that are economically linked [including both cities and suburban areas]. Residential segregation is measured at the census-tract level. Both data and methods constructing MA residential segregation measures are available at the U.S. Census Bureau website: http://www.census.gov/hhes/www/housing/housing_patterns/front_toc.html. Constructed measures of residential segregation used in this analysis are discussed.

Methods

Measuring African American Residential Segregation.

Massey and Denton's (1994) *American Apartheid* (using segregation measures mathematically defined in Massey and Denton [1988]) distinguished five unique components/dimensions of segregation that form the basis of contemporary research. Iceland, et al.'s (2002) data have generated measures for each of these five components. Using the measures discussed above, I test how dimensions of African American residential segregation explain arrest. The mathematical formulas of each index and descriptions are presented in Table 2.

[Insert Table 3 about here.]

Statistical Model

To better determine if changes in segregation correlate with changes in arrest within cities, I use fixed effect models. As Allison (2005) and Halaby (2004) note, fixed effect models remove invariant, unobserved heterogeneity and are generally underutilized in social science research. At the metropolitan area, much existing research on spatial correlations between arrest and residential segregation has focused on statistical models measuring change across observations, with few papers making full usage of panel data. At the metropolitan level, the extensive computation required for aggregating micro-census data, shifting city boundaries over time, and the lack of convenient links between FBI UCR and census data may constitute factors that limit analysis. One notable exception is a recent paper by Kent and Jacobs (2005), who utilize fixed effect models to examine the relationship between the size of minority populations and the size of the police force within metropolitan areas.

The given arrest rate for an MA at time t is modeled by the equation:

$$\text{Arrest Rate}_{MA,t} = \boldsymbol{\beta}_0 + \boldsymbol{\beta}_1\mathbf{Segregation}_{MA,t} + \boldsymbol{\beta}_k\mathbf{Controls}_{MA,t} + \varepsilon_{MA,t}$$

Where a constant $\boldsymbol{\beta}_0$, the segregation level of the MA and estimated measure, the row vector of k controls and estimated coefficients $\boldsymbol{\beta}_k\mathbf{Controls}$, and the error term $\varepsilon_{MA,t}$.

The error term $\varepsilon_{MA,t}$ is defined as:

$$\varepsilon_{MA,t} = v_{MA} + \omega_t + e_{MA,t}$$

where v_{MA} represents the time invariant components at the MA level, ω_t represents the invariant components observed at time t, and $e_{MA,t}$ represents a random disturbance term for each MA/year observation.

Calculations were performed using the 'xtreg, fe' command in STATA 10.1. Year fixed effects are included using indicator variables for each census year that is included in the dataset. As a check on robustness of results, models incorporating robust standard errors and bootstrapping of results were estimated, yielding similar coefficients to those provided below.

It should be noted that the use of fixed effect models are not without drawbacks. While eliminating unobserved, invariant heterogeneity, the use of these fixed effects are less efficient than multilevel and OLS regression modeling. The comparatively larger standard errors result in an increased likelihood of false-negatives ['type II' errors] (Allison 2005). In all models estimated, both a Hausman test for MA fixed effects and Fisher exactness test for year fixed effects were found to be highly significant in all models estimated, implying the need for fixed effect models in analysis to reduce bias in estimation (Halaby 2004). Consequently, the year and MA fixed effects decrease bias due to unobserved, invariant effects, but increase probability falsely non-significant findings.

Results

Bivariate Models

In the bivariate analysis presented below, I analyze a panel of 215 metropolitan areas and 591 MA/yr observations with complete data for arrest and segregation measures. In doing so, I examine the association of Massey and Denton's five dimensions of segregation (evenness, exposure, concentration, centralization, and clustering) on arrest rates within MAs using the methods outlined above. Results are presented for total, violent, and property arrest rates for (1) the full MA population and (2) black and white populations residing within an MA.

[Insert Table 3 about here.]

In Table 3, bivariate regression results are presented for the associations of African American residential segregation on total, violent, and property arrest rates of all individuals within an MA. Three dimensions of segregation, the dissimilarity index, the isolation index, and the spatial proximity index, have highly significant associations with arrest rates. A one point increase in the dissimilarity index, a measure of evenness, is associated with a 1.04 ($p<0.001$) increase in the total arrest rate and a 0.12 ($p<0.01$) in the property arrest rate. A one-point increase in the isolation index, a measure of exposure, is associated with a 0.90 ($p<0.001$) increase in the total arrest rate, a 0.03 ($p<0.01$) increase in the violent arrest rate, and a 0.08 ($p<0.01$) increase in the property arrest rate. A one-point increase in the spatial proximity, a measure of clustering index, is associated with a 0.75 ($p<0.01$) increase in the total arrest rate, a 0.03($p<0.01$) increase in the violent arrest rate, and a 0.08 ($p<0.05$) increase in the property arrest rate. With the exception of a marginal association between concentration and property arrests, neither the centralization index nor the absolute concentration index was associated with statistically significant changes in arrest rates.

[Insert Table 4 about here.]

Table 4 presents the bivariate regression results for the associations of African American residential segregation on arrest rates within metropolitan areas. As in Table 3, the dissimilarity, isolation, and spatial proximity indices have statistically significant associations with arrest rates, while concentration and centralization indices are largely insignificant. Notable racial variation occurs for (1) the association of the dissimilarity index on property arrest rates, (2) the association of the isolation index on total arrest rates, and (3) the association of the spatial proximity index on total arrest rates; however, estimated coefficients for associations of residential segregation on

black and white arrest rates generally remain similar in size. Given that these results are not opposite in magnitude (i.e., with residential segregation increasing arrest rates for African Americans, but either non-significant or negative for whites), this bivariate pattern suggests that residential segregation is associated with increased arrest within metropolitan areas for both African Americans and whites.

As a result of the bivariate analysis, some basic conclusions may be drawn. Segregation measures of evenness, exposure, and clustering are significantly associated with increased arrest rates within metropolitan areas, while concentration and centralization measures remain insignificant. Consequently, these results suggest how African Americans are (1) residentially distributed (in terms of spatial proximity and being evenly spread throughout census tracts) and (2) exposed to non-blacks among census tracts within metropolitan areas explain arrest rates.

Secondly, as noted above, while significant variations (i.e., two standard deviations or more) in the associations of measures of segregation on black-white arrest rates do occur, approximately two-thirds of similar coefficient "pairs" have similar magnitudes. In all estimated models, no significant, negative correlation is observed between residential segregation and white arrest rates. Hence, dimensions of residential segregation largely remain similar in associations on arrest rates for both whites and blacks.

Multivariate Analysis

With the addition of the IPUMS data to the UCR arrest and Census segregation measures, my selection criteria resulted in an analysis sample of 207 metropolitan areas and 562 MA/year observations. Based on results of bivariate analysis, the multivariate analyses below examine how the segregation measures of (1) evenness, (2) exposure, and (3) clustering predict changes in arrest rates when MA-level controls are added. These MA-level controls include the sex ratio, the proportion of respondents living in poverty, the divorce rate, the MA population, police

officers per 1000 population, and the proportion of respondents ages 15-35 who are foreign-born. Race-specific controls are used when estimating black and white arrest rates.

General Arrest Rates

Table 5 contains the associations of dimensions of African American segregation on arrest rates within metropolitan areas. For total arrests, all three dimensions of segregation are highly significant (*p<0.01*) and positively correlated with the dependent variable. For violent arrest rates, measures of clustering ($p<0.01$) and exposure ($p<0.05$) are significant and positively correlated. For property arrest rates, evenness has a significant and positive ($p<0.05$) correlation, while clustering has a marginally significant and positive correlation. Overall, compared to results from Table 3, controls only modestly mediate the associations between segregation measures and total and violent arrest rates; however, for property arrest rates within MAs, controls reduce the effect of evenness by one-third and social isolation by two-thirds in magnitude relative to coefficients reported in Table 3.

[Insert Table 5 about here.]

Few control variables are significantly associated with changes in arrest rates within cities. The per capita number of police officers within an MA is a highly significant predictor of increased arrest ($p<0.01$) for all types of arrest; this is consistent with findings in existing research (Kent and Jacbos 2005 Ousey and Lee 2008). For property arrest rates, the log of the MA population has a significant (though marginal for violent arrest rates) and negative association. For property arrest rates, the prevalence of police officers within an MA has a positive and marginally significant effect.

African American and White Arrest Rates

Table 6A contains the associations of dimensions of African American segregation on African American arrest rates within metropolitan areas. For total arrests, all three dimensions of segregation are highly significant ($p<0.01$) and positively correlated with the dependent variable. For violent arrest rates, clustering ($p<0.01$) is a significant predictor, while exposure and evenness are marginally significant. For property arrest rates, clustering remains a positive and significant predictor ($p<0.01$), while exposure is marginally significant. These results suggest clustering is a significant predictor across all measures of arrest, while evenness and exposure are significant for total and violent arrest rates.

[Insert Table 6A about here.]

Among control variables in Table 6A, the African American measures for the prevalence of police in an MA and the population residing within an MA are significant predictors of changes in African American arrest rates. As the number of police officers per thousand residents rises within an MA, African American arrest rates are found to significantly ($p<0.001$) increase. Consistent with the hypothesis of racial threat, an increase in the number of African Americans residing in a metropolitan area is associated with increases in property arrest rates ($p<0.01$); but the association is only significant for Model 1 for violent arrest rates, while a non-significant negative association is observed for total arrest rates.

[Insert Table 6B about here.]

Table 6B contains the associations of dimensions of segregation on white arrest rates. In general, relative to African Americans, African American segregation more weakly predicts white arrest rates. For total arrest rates, measures of clustering ($p<0.05$) and exposure ($p<0.01$) are positive, significant predictors. For violent arrest rates, the measure of exposure is a

significant, positive predictor of arrest. Among property arrest rates, the measure of evenness has a significant ($p<0.01$) and positive correlation.

Among controls, the divorce rate, the white MA population, and the prevalence of police officers are significantly associated in some models predicting changes in white arrest rates. Divorce has a negative association ($p<0.05$) with violent arrest, but a positive association with property arrest rates. While negative for all arrest rates, the size of the white MA population is significant in models of violent and property arrest rates. A change in the number of police officers is associated with a marginally significant and positive increase in total and violent arrest rates; however, the correlation is highly significant ($p<0.02$ in Model 1, $p<0.01$ in Models 2-3), predicting increased property arrest rates for whites. In general, the control variables are more significant for predicting white arrest rates within cities, relative to blacks.

Comparing the associations of measures of African American segregation on white and black arrest rates, results presented in Tables 6A-B show that correlations are comparable across racial groups. Notable exceptions of racial differences in segregation effects, where two or more standard deviations difference are observed, occur for (1) clustering in violent arrest rates and (2) evenness and clustering in property arrest rates. For African American Americans, spatial proximity is significant in predicting violent and property arrest rates, but non-significant for whites. In contrast, evenness is significant in predicting property arrest rates among whites, but not for blacks. These differences, however, are not consistent with a hypothesis that segregation would be positively correlated with African American arrest rates and negatively associated with white arrest rates. Consequently, the associations of dimensions of segregation on arrest rates within MAs may be summarized as: (1) largely similar for black and white arrest rates and (2) not possessing a general pattern such that African American uniquely impacts African Americans.

Discussion

While a large body of research has incorporated segregation into crime and arrest in studying macro-causes of crime, relatively little research has expounded upon segregation theory, developed by Massy and Denton (1994), to systematically examine how dimensions of segregation impact arrest. Some studies have explored multiple dimensions of segregation and arrest (Stolzenburg et al. 2006; Ousey and Lee 2008), noting that measures of evenness are not as theoretically grounded as isolation in explaining arrest. One recently published paper by Eitle (2009) has examined dimensions of segregation and homicide in a cross-sectional sample of metropolitan areas. By incorporating measures of dimensions of segregation with longitudinal census and arrest data, this paper provides one of the first systematic explorations of how components of segregation predict arrest rates within metropolitan areas.

By examining the various dimensions of African American segregation, results suggest that evenness, exposure, and spatial proximity are significant predictors of arrest rates, while concentration and centralization do not substantially vary. The pattern of results varies substantially by type of arrest. Measures of evenness, exposure and spatial proximity are generally highly significant and positive in predicting total arrest rates, with little variation for the full population of whites and blacks. For violent arrest rates, all measures of segregation are significant and positive among African Americans; however, a significant variation in the effect of evenness among blacks and whites results in exposure and clustering being significant for the full population. For property arrest rates, evenness is the only significant dimension for white arrest rates, while clustering remains only significant for black arrest rates. As a whole, these results suggest that African American segregation is a significant predictor of arrest changes within metropolitan areas, but that no single dimension of segregation remains an overarching dimension is a major predictor of arrest. Hence, while exposure may remain theoretically linked

to violent arrest rates (Sampson and Wilson 1995 Stolzenburg, et al. 2004), measures of evenness and clustering are alternatively significant for property arrest rates.

One surprising finding is that, in multivariate models, African American segregation has largely similar associations in predicting black and white arrest rates. When incorporating measures examining inequality in black-white arrest rates (similar to Ousey and Lee 2008), similarity in associations of segregation measures for both racial groups may result in non-significance, even for cases when African American segregation is significant for both groups. In explaining the associations of African American residential segregation on black and white arrest rates, findings are more consistent with the theory of concentrated disadvantage than racial threat.

While the associations of African American segregation on black and white arrest rates may be similar, patterns of control variable predicting black and white arrest rates are notably different. Among African American control variables, increases in the prevalence of police officers are associated with increased violent arrest rates, while an increase in the black MA population was associated with increased violent and property arrest rates. Among white control variables, similar patterns to those of African Americans were significantly associated with changes in arrest. However, two interesting negative associations were observed: (1) between white population increases and violent and property arrests and (2) relative differences in significance for prevalence of police officers and arrests. The positive correlation between black populations and arrest, but negative correlations between white population and arrest is consistent with the view of racial threat theory (Parker et al. 2005). The difference in significance of total arrest rates arises from the increased size of standard errors, suggesting that the average effect of increased number of police officers varies across MAs; the smaller size of this effect for violent arrest rates suggests that increased prevalence of police officers may lead to increased arrest of blacks relative to whites.

Interestingly, no significant association was observed between immigration and arrest. The negative correlation between immigration and arrest is predicted by Sampson et al. (2005),

while racial variation in the associations of immigration would be consistent with theories of segmented assimilation (Waters 1999). The results presented here, while far from conclusive, suggest that the increased prevalence of immigrants is not correlated with arrest.

Future Analyses

By extending empirical and theoretical work, future research may help to both validate findings and further theoretical modeling. For empirical research, applying new methods and extending work to include other states may prove fruitful. By analyzing new spatial data sources, such states, counties, and neighborhoods, results may shed additional light on how African American segregation impacts crime and arrest. While the fixed effect modeling was necessary to reduce bias in estimated coefficients, an increased number of times would decrease probability of type II errors, and that may arise from inconsistent data for single MA/year observations. While some research has used multilevel models to examine the association between individual criminal behavior and neighborhood/metropolitan residential segregation (Hipp 2007b; Krivo et al. 2009), extension of this research to longitudinal data would allow a more systematic understanding of how residential segregation impacts long-term criminal behavior.

This paper has also focused on the statistical associations between African American segregation and arrest rates within metropolitan areas. Given that the percentage of the U.S. population classified as Hispanic/Latino rose from 4% to 12% between 1980 and 2000 (Landale and Oropesa 2007), recent scholarship has called for expanding segregation research to include additional racial groups (Sampson and Bean). While existing research has found that immigration is associated with lower crime rates (Sampson, et al. 2005; Martinez and Nielsen 2006), some racial scholars have argued that recent immigrants assimilate into a black/non-black color line (Lee and Bean 2004, 2007; Waters 1999). Consequently, studies incorporating

immigrant groups, assimilation processes, and non-black residential segregation would help to better contextualize the above findings on African American segregation and arrest.

Lastly, the results of this study have provided additional insights for theories of relative deprivation and racial threat; however, findings do not neatly fit into either theory. Consistent with the idea that African American segregation is a marker for a number of social disadvantages in relative deprivation, the associations of African American segregation on both black and white arrest rates remain remarkably similar; however, consistent with the concept of racial threat, results show increased mediation associations of white control variables and opposite associations for the number of blacks and whites residing within metropolitan areas. If these findings hold, further research may clarify the roles racial threat and relative deprivation play in the link between African American residential segregation and arrest.

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Table 1: Mean and Standard Deviations for Metropolitan Statistical Areas in Sample

Variable	1980	1990	2000	Panel
Dependent Variables				
Total Arrest Rate	52.00	62.51	48.10	54.09
	(19.00)	(22.64)	(27.25)	(24.23)
Violent Crime Rate	1.933	2.45	1.69	2.02
	(1.07)	(1.47)	(1.34)	(1.354)
Property Crime Rate	9.00	9.46	4.83	7.63
	(2.71)	(3.41	(2.84	(3.68)
Total Arrest Rate, Whites	40.15	43.96	33.02	38.83
	(16.41)	(19.94)	(20.83)	(19.81)
Violent Crime Rate, Whites	1.13	1.36	1.02	1.16
	(0.64)	.940	(1.02	(.903)
Property Crime Rate, Whites	6.49	6.46	3.23	5.29
	(2.78)	(3.27)	(2.20)	(3.17)
Total Arrest Rate, African American	11.15	17.61	14.07	14.38
	(9.67)	(14.85)	(14.39)	(13.55)
Violent Crime Rate, African American	0.779	1.05	.638	0.82
	(0.71)	(.977)	(0.664)	(0.81)
Property Crime Rate, African American	2.38	2.82	1.45	2.19
	(1.85)	(2.27)	(1.485)	(1.97
Segregation Measures				
Isolation Index Dissimilarity Index	61.95	56.04	52.26	56.44
	(13.19	(13.55	(13.35	(13.92
Isolation Index	40.35	36.0984	36.02	37.34
	(24.41)	(23.04)	(21.86)	(23.09)
Absolute Concentration Index	89.45	89.33	89.16	89.30
	(11.80)	(11.07)	(9.97)	(10.89)
Absolute Centralization Index	74.46	72.05	70.46	72.20
	(18.56)	(18.37)	(18.56)	(18.53)
Spatial Proximity Index	119.41	117.29	117.26	117.91
	(18.19)	(16.49)	(15.82)	(16.78)
Control Variables				
Full MA				
Sex Ratio	94.74	95.58	95.93	95.46
	(5.87)	(5.62)	(4.22)	(5.25)
Divorce Rate	16.09	17.25	16.35	16.57
	(6.95	(6.02	(5.53	(6.16)
Percentage of Population Below Poverty Line	15.47	16.71	15.39	15.85
	(4.93)	(5.94)	(4.98)	(5.33)
Log of MA population	12.76	12.81	12.95	12.85
	(1.011)	(1.02)	(1.056)	(1.034)
Proportion of Immigrants in MA between Ages 15-35	4.54	8.62	12.21	8.71
	(5.20)	(8.78)	(10.4)	(9.11)
Number of Police Officers Per Thousand Residents	1.60	1.62	1.67	1.63
	(.813)	(.873)	(0.863)	(.851)
African Americans in MA				
Sex Ratio	112.56	114.73	104.29	110.26

	(90.34)	(104.36)	(32.33)	(80.42)
Divorce Rate	41.45	40.30	32.26	37.72
	(18.15)	(14.85)	(11.34)	(15.37)
Percentage of Population	33.79	36.98	32.48	34.38
Below Poverty Line	(10.12	(12.03)	(9.962)	(10.89)
Log of MA population	9.91	9.99	10.39	10.1
	(1.96)	(1.95)	(1.69)	(1.87)
Proportion of Immigrants	3.69	6.23	8.87	6.43
in MA between Ages 15-35	(6.644)	(8.06)	10.69)	8.99
Number of Police	1.60	1.62	1.67	1.63
Officers Per Thousand	(.813)	(.873)	(0.863)	(.851)
Residents				
Whites in MA				
Sex Ratio	95.11	95.66	95.73	95.52
	(5.53)	(5.44)	(4.21)	(5.06)
Divorce Rate	11.75	12.85	12.23	12.29
	(4.52)	(4.07)	(3.78)	(4.13)
Percentage of Population	11.80	12.20	11.00	11.64
Below Poverty Line	(3.67)	(4.40	(3.79)	(4.00)
Log of MA population	12.52	12.53	12.60	12.55
	(.98)	(1.00)	(1.01)	(1.00)
Proportion of Immigrants	2.01	3.22	3.87	3.09
in MA between Ages 15-35	(1.69	(2.53)	(3.42)	(2.79)
Number of Police	1.60	1.62	1.67	1.63
Officers Per Thousand	(.813)	(.873)	(0.863)	(.851)
Residents				
Number of Observations	169	188	205	562
Number of MAs	169	188	205	207

Table 2: Description of the components and measurements of African American residential segregation.

Degrees of Segregation	**Index of Measurement**	**Statistical Measure**	**Description**
Evenness	Dissimilarity Index	$$\frac{\sum_{c=1}^{n} t_c \mid p_c - P \mid}{2TP(1-P)}$$	Measures the degree to which African Americans are unequally distributed among an MAs census tracts. Conceptually, the proportion of African Americans who would need to be moved for equal distribution within an MA's census tracts.
Exposure	Isolation Index	$$\mathrm{I}=\sum_{c=1}^{n}\left(\frac{b_c}{B}\right)\left(\frac{b_c}{w_c}\right)$$ and $$\frac{(I-P)}{(1-P)}$$	Measures the degree to which African Americans are separated from whites in census tracts. Conceptually, the extent to which an African American shares a census tract only with other African Americans.
Concentration	Absolute Concentration Index	$$1-\left\{\frac{\sum_{c=1}^{n}\frac{b_c a_c}{B}-\sum_{c=1}^{n1}\frac{t_c a_c}{T_1}}{\sum_{c=n2}^{n}\frac{t_c a_c}{T_2}-\sum_{c=1}^{n1}\frac{t_c a_c}{T_1}}\right\}$$	The degree to which African Americans occupy the smallest census tracts within an MA. Conceptually, the degree to which African Americans live in the smallest census tracts compared to the total MA population
Centralization	Absolute Centralization Index	$$\frac{\left\{\sum_{c=1}^{n}\left[\frac{b_c}{B}\sum_{j=1}^{n}c_{cj}b_j\right]-\left[\frac{B}{n^2}\sum_{c=1}^{n}\sum_{j=1}^{n}c_{cj}\right]\right\}}{\left\{\sum_{c=1}^{n}\left[\frac{b_c}{B}\sum_{j=1}^{n}c_{cj}t_j\right]-\left[\frac{B}{n^2}\sum_{c=1}^{n}\sum_{j=1}^{n}c_{cj}\right]\right\}}$$	The degree to which African Americans reside within the central census tracts of an MA. Conceptually, the extent to which African Americans reside in 'central city' census tracts versus suburban census tracts.
Clustering	Spatial Proximity Index	$$\left(\frac{XP_{bb}+YP_{ww}}{TP_{tt}}\right),$$ where $$Pgg=\sum_{c=1}^{n}\sum_{j=1}^{n}\left\lfloor\frac{g_c g_j c_{cj}}{G^2}\right\rfloor$$ and {g,G}={b,B},{w,W},{t,T}	The degree to which African Americans are located together within an MA. Conceptually, the degree to which African Americans reside in adjoining census tracts versus being spread evenly within MA census tracts.

Definitions:

n= he number of areas (census tracts) in the metropolitan area, ranked smallest to largest by land area
t_c the total population of area c
b_c=the minority population (African American) of area c
w_c=the majority population (non-Hispanic Whites) of area c
p_c the ratio of b_c to t_c (proportion of area c's population that is black)
a_c =the land area of area c
d_{ij}=the distance between area c and area c centroids, where $d_{ci} = (0.6a_c)^{0.5}$
c_{cj}=the exponential transform of $-c_{cj}$ [= $\exp(-d_{cj})$]
B=the sum of all b_c (the total African American population)
W=the the sum of all w_c (the total non-Hispanic White population)
T=the the sum of all t_c (the total population)
P=the ratio of B to T (proportion of the MA's population that is African American)

(source: Iceland, et al. 2002, Massey and Denton 1988, 1994)

Table 3: Fixed Effect Models of Dimensions of African American Segregation Predicting Total, Violent, and Property Arrests Within Metropolitan Areas			
Segregation	Total Arrest Rate	Violent Arrest Rate	Property Arrest Rate
Dissimilarity Index (Evenness)	1.041*** (0.254)	0.014 (0.012)	0.122*** (0.033)
Isolation Index (Exposure)	0.896*** (0.234)	0.034** (0.011)	0.083** (0.031)
Absolute Concentration Index (Concentration)	0.123 (0.314)	0.016 (0.015)	0.079+ (0.041)
Absolute Centralization Index (Centralization)	-0.062 (0.172)	-0.001 (0.008)	-0.017 (0.023)
Spatial Proximity Index (Clustering)	0.752** (0.227)	0.029** (0.011)	0.076* (0.030)
*** p<0.001, ** p<0.01, * p<0.05 [two-tailed], + p<0.05 [one-tailed]			

Table 4: Fixed Effect Models of Dimensions of African American Segregation Predicting Total, Violent, and Property Arrests Within Metropolitan Areas

	Total Arrest Rate		Violent Arrest Rate		Property Arrest Rate	
	Black Arrest Rate	White Arrest Rate	Black Arrest Rate	White Arrest Rate	Black Arrest Rate	White Arrest Rate
Segregation Index						
Dissimilarity Index	0.423*** (0.097)	0.603** (0.189)	0.013* (0.006)	0.002 (0.007)	0.020 (0.015)	0.098*** (0.024)
Isolation Index	0.225* (0.090)	0.631*** (0.172)	0.015** (0.006)	0.018** (0.007)	0.042** (0.014)	0.041+ (0.023)
Absolute Concentration Index	0.155 (0.119)	-0.053 (0.231)	0.013+ (0.007)	0.003 (0.009)	-0.009 (0.010)	0.047 (0.030)
Absolute Centralization Index	-0.050 (0.065)	-0.032 (0.127)	-0.001 (0.004)	0.0003 (0.005)	0.027 (0.018)	-0.007 (0.016)
Spatial Proximity Index	0.221* (0.087)	0.526** (0.168)	0.016** (0.005)	0.014* (0.007)	0.037** (0.013)	0.038+ (0.022)

*** p<0.001, ** p<0.01, * p<0.05 [two-tailed], + p<0.05 [one-tailed]

Table 5: GLS Estimates for Associations of African American Residential Dissimilarity, Isolation, and Concentration on Arrest Rates Within MAs

	Total Arrests			Violent Arrest			Property Arrest		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
African American Segregation Measures									
Dissimilarity	0.753**	-	-	0.005	-	-	v3	-	-
	(0.281)			(0.014)			0.079*		
							(0.037)		
Isolation Index	-	0.809**	-	-	0.035**	-	-	0.029	-
		(0.251)			(0.012)			(0.033)	
Concentration Index	-	-	0.735**	-	-	0.024*	-	-	0.056+
			(0.230)			(0.011)			(0.030)
Control Variables									
Sex Ratio	0.067	0.066	-0.197	0.007	0.010	0.001	-0.066	-0.072	-0.089
	(0.440)	(0.437)	(0.440)	(0.022)	(0.021)	(0.022)	(0.058)	(0.058)	(0.058)
Divorce Rate	0.284	0.133	0.092	0.001	0.002	-0.0004	0.125*	0.106+	0.104+
	(0.461)	(0.454)	(0.454)	(0.023)	(0.022)	(0.022)	(0.061)	(0.060)	(0.060)
Percentage of Population Below Poverty Line	0.010	0.050	-0.092	0.031	0.035	0.029	-0.016	-0.020	-0.026
	(0.561)	(0.559)	(0.558)	(0.028)	(0.027)	(0.027)	(0.074)	(0.074)	(0.074)
Log of MA population	-15.065	-14.610	-16.781+	-0.882+	-0.611	-0.760	-2.937*	-3.388**	-3.264*
	(9.852)	(9.742)	(9.615)	(0.484)	(0.475)	(0.471)	(1.293)	(1.292)	(1.270)
Proportion of Immigrants in MA between Ages 15-35	0.330	0.306	0.401	0.030+	0.031+	0.034*	0.029	0.024	0.032
	(0.349)	(0.347)	(0.349)	(0.017)	(0.017)	(0.017)	(0.046)	(0.046)	(0.046)
Number of Police Officers Per Thousand Residents	7.429**	8.463**	8.322**	0.481***	0.500***	0.492***	1.260***	1.345***	1.348***
	(2.755)	(2.732)	(2.731)	(0.135)	(0.133)	(0.134)	(0.362)	(0.362)	(0.361)
Constant	187.308	194.661	193.482	11.279	6.322	7.724	44.859*	54.937**	49.476**
	(139.536)	(135.166)	(135.406)	(6.857)	(6.594)	(6.639)	(18.320)	(17.925)	(17.886)
Year Dummies									
1980	-14.896***	-13.342***	-12.221***	-0.531***	-0.564***	-0.515***	-1.098**	-0.856**	-0.817**
	(2.585)	(2.399)	(2.375)	(0.127)	(0.117)	(0.116)	(0.339)	(0.318)	(0.314)
1990 [reference]									
2000	-10.838***	-13.265***	-13.880***	-0.711***	-0.740***	-0.756***	-3.967***	-4.196***	-4.258***
	(2.420)	(2.286)	(2.304)	(0.119)	(0.112)	(0.113)	(0.318)	(0.303)	(0.304)
Number of MA sample years	562	562	562	562	562	562	562	562	562
Number of MAs	207	207	207	207	207	207	207	207	207
R-square	0.212	0.219	0.218	0.223	0.241	0.233	0.592	0.588	0.591

+p<.10 *p<.05 **p<.01 ***p<.001 [two-tailed test]

Table 6A: GLS Estimates for Associations of African American Residential Dissimilarity, Isolation, and Concentration on African American Arrest Rates Within MAs

	Total Arrests			Violent Arrest			Property Arrest		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
African American Segregation Measures									
Dissimilarity	0.403***	-	-	0.012+	-	-	0.017	-	-
	(0.107)			(0.007)			(0.016)		
Isolation Index	-	0.308**	-	-	0.012+	-	-	0.025+	-
		(0.100)			(0.007)			(0.015)	
Concentration Index	-	-	0.376***	-	-	0.018**	-	-	0.040**
			(0.094)			(0.006)			(0.014)
Control Variables									
Sex Ratio	-0.004	-0.004	-0.010	-0.0003	-0.0004	-0.001	-0.001	-0.001	-0.002
	(0.008)	(0.008)	(0.008)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Divorce Rate	0.025	0.023	0.035	0.002	0.002	0.002	0.007	0.008	0.009+
	(0.032)	(0.032)	(0.032)	(0.002)	(0.002)	(0.002)	(0.005)	(0.005)	(0.005)
Percentage of Population Below Poverty Line	-0.024	-0.007	-0.046	0.003	0.003	0.001	0.013	0.012	0.007
	(0.057)	(0.057)	(0.058)	(0.004)	(0.004)	(0.004)	(0.009)	(0.009)	(0.009)
Log of MA population	0.168	-1.740	-2.008	0.213*	0.144	0.121	0.818***	0.693**	0.632**
	(1.414)	(1.462)	(1.444)	(0.097)	(0.099)	(0.099)	(0.212)	(0.218)	(0.215)
Proportion of Immigrants in MA between Ages 15-35	0.025	0.081	0.087	-0.001	0.001	0.001	-0.004	-0.001	0.001
	(0.066)	(0.067)	(0.066)	(0.005)	(0.005)	(0.005)	(0.010)	(0.010)	(0.010)
Number of Police Officers Per Thousand Residents	3.954***	4.412***	4.450***	0.002	0.310***	0.310***	0.622***	0.634***	0.633***
	(1.106)	(1.101)	(1.090)	(0.002)	(0.075)	(0.074)	(0.166)	(0.164)	(0.162)
Constant	-12.664	16.296	-12.371	-2.361*	-1.460	-2.815*	-7.912**	-6.645**	-9.673***
	(16.402)	(14.824)	(16.146)	(1.124)	(1.009)	(1.102)	(2.463)	(2.206)	(2.405)
Year Dummies									
1980	-9.170***	-8.151***	-7.893***	-0.337***	-0.316***	-0.313***	-0.442**	-0.443**	-0.447***
	(1.007)	(0.911)	(0.854)	(0.069)	(0.062)	(0.058)	(0.151)	(0.136)	(0.127)
1990 [reference]									
2000	-2.539**	-3.333***	-3.512***	-0.448***	-0.467***	-0.472***	-1.546***	-1.559***	-1.564***
	(0.967)	(0.923)	(0.903)	(0.066)	(0.063)	(0.062)	(0.145)	(0.137)	(0.135)
Number of MA sample years	562	562	562	562	562	562	562	562	562
Number of MAs	207	207	207	207	207	207	207	207	207
R-square	0.263	0.253	0.266	0.246	0.247	0.257	0.395	0.395	0.408

+p<.10 *p<.05 **p<.01 ***p<.001 [two-tailed test]

Table 6B: GLS Estimates for Associations of African American Residential Dissimilarity, Isolation, and Concentration on White Arrest Rates Within MAs

	Total Arrests			Violent Arrest			Property Arrest		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
African American Segregation Measures							0.073** (0.027)		
Dissimilarity	0.339 (0.206)	-	-	-0.009 (0.008)	-	-		-	-
Isolation Index	-	0.535** (0.193)	-	-	0.016* (0.007)	-	-	-0.003 (0.026)	-
Concentration Index	-	-	0.441* (0.171)	-	-	0.005 (0.006)	-	-	0.014 (0.023)
Control Variables									
Sex Ratio	-0.024 (0.323)	-0.096 (0.321)	-0.138 (0.323)	-0.001 (0.012)	-0.002 (0.012)	-0.001 (0.012)	-0.064 (0.042)	-0.068 (0.043)	-0.072+ (0.043)
Divorce Rate	0.035 (0.398)	0.028 (0.394)	-0.079 (0.396)	-0.035* (0.015)	-0.033* (0.015)	-0.035* (0.015)	0.110* (0.052)	0.102+ (0.052)	0.100+ (0.052)
Percentage of Population Below Poverty Line	0.110 (0.565)	0.297 (0.567)	0.109 (0.560)	0.028 (0.021)	0.040+ (0.021)	0.033 (0.021)	0.021 (0.074)	-0.005 (0.075)	0.000 (0.074)
Log of MA population	-9.073 (6.618)	-5.677 (6.710)	-8.608 (6.437)	-0.509* (0.249)	-0.225 (0.253)	-0.382 (0.244)	-1.581+ (0.863)	-2.343** (0.890)	-2.181* (0.852)
Proportion of Immigrants in MA between Ages 15-35	0.111 (0.675)	0.296 (0.675)	0.363 (0.681)	-0.047+ (0.025)	-0.038 (0.025)	-0.042 (0.026)	0.077 (0.088)	0.064 (0.090)	0.075 (0.090)
Number of Police Officers Per Thousand Residents	3.979+ (2.211)	4.649* (2.183)	4.532* (2.185)	0.162+ (0.083)	0.159+ (0.082)	0.153+ (0.083)	0.824** (0.288)	0.912** (0.290)	0.918** (0.289)
Constant	132.356 (94.955)	92.130 (93.854)	104.405 (93.248)	8.267* (3.575)	3.539 (3.541)	5.604 (3.534)	25.062* (12.380)	39.585** (12.455)	36.030** (12.349)
Year Dummies									
1980	-5.871** (1.954)	-5.127** (1.755)	-4.443* (1.740)	-0.295*** (0.074)	-0.351*** (0.066)	-0.331*** (0.066)	-0.288 (0.255)	0.026 (0.233)	0.021 (0.230)
1990 [reference]									
2000	-8.953*** (1.711)	-10.040*** (1.529)	-10.470*** (1.534)	-0.280*** (0.064)	-0.245*** (0.058)	-0.252*** (0.058)	-2.788*** (0.223)	-3.054*** (0.203)	-3.062*** (0.203)
Number of MA sample years	562	562	562	562	562	562	562	562	562
Number of MAs	207	207	207	207	207	207	207	207	207
R-square	0.187	0.199	0.196	0.159	0.168	0.158	0.582	0.573	0.573

+p<.10 *p<.05 **p<.01 ***p<.001 [two-tailed test]