Economic Segregation, Race, and Homicide*

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Objective. Prior research assessing the association between structured inequality and homicides has produced inconsistent findings, particularly in regard to establishing an association between economic disadvantage and black homicide rates. In this study, we employ a measure of the spatial distribution of income, Jargowksy's (1996) economic segregation measure, to assess overall and race-specific homicide rates. *Methods.* Using cross-sectional Census data and Supplemental Homicide Report data across 166 Metropolitan Statistical Areas, the present analysis uses negative binomial regression models to examine the association between economic segregation and homicide rates. *Results.* We find that both economic segregation and absolute deprivation (i.e., the overall extent of economic disadvantage) are robust predictors of black, white, and overall homicide rates. However, an alternative measure of economic segregation, a measure capturing poverty concentration, was not found to be a significant predictor of black homicide rates. *Conclusion.* We suggest that further studies should consider the extent of isolation across the income continuum, instead of focusing solely on poverty concentration.

For much of the 20th century, criminologists have explored the consequences of structured disadvantage for understanding variation in urban violent crime rates. Although the trajectory of this vein of research has been guided by different theoretical foundations, different methodological approaches, and different levels of aggregation, a core thesis that unites this research is the notion that economic disadvantage is associated with violent crime generally and homicide specifically (Blau and Blau, 1982; Parker, 1989). Although there exists some evidence to support the general argument that economic disadvantage is positively associated with homicide rates, the results are far from unequivocal. While the cumulative evidence generally supports an association between measures of economic disadvantage and white homicide rates, research has failed to consistently find evidence that indicators of structural economic disadvantage are independent and valid

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SOCIAL SCIENCE QUARTERLY, Volume 87, Number 3, September 2006

predictors of black homicide rates (Messner and Golden, 1992; Phillips, 2002; Krivo and Peterson, 2000; Shihadeh and Ousey, 1996; Shihadeh and Flynn, 1996). The inconsistency of these findings is particularly frustrating to criminologists because of the theoretical importance of economic disadvantage for explaining the relatively high black homicide rates.

More recently, however, the spatial distribution of economic disadvantage, especially poverty concentration, has become the focus of several studies of violent crime (Stretesky, Schuck, and Hogan, 2004; Lee, 2000; Parker and Pruitt, 2000; Peterson and Krivo, 1999).This work has been inspired by William Julius Wilson and his seminal work on the development of the black urban underclass in America. Although the preponderance of evidence accumulated to this point generally supports a core element of Wilson's thesis (see also Sampson and Wilson, 1995), that indicators of concentrated disadvantage are predictive of black violent crime rates, there is a major qualification—studies employing a separate measure of poverty concentration have not produced unequivocal findings of an association between poverty concentration and intercity black homicide rates. In the present study, we examine two different measures of the spatial distribution of economic disadvantage—poverty concentration and Paul Jargowsky's (1996, 1997) neighborhood sorting index—in order to evaluate the predictive utility of each these measures of economic segregation and their association with race-specific homicide rates across 166 metropolitan areas. We examine the foundations of each respective measure and suggest that poverty concentration may not be the optimal measure when it is employed to explain variation in race-specific homicide rates across metro areas. We assess these measures' predictive utility using 2000 decennial Census data and Supplemental Homicide Report data from the years 1999, 2000, and 2001.

Background

There are several different structural theories that explain why there should exist a positive association between economic deprivation and homicides (e.g., social disorganization, rational choice, Marxist and neo-Marxist explanations), but three major explanations have emerged: (1) absolute deprivation (i.e., the overall extent of economic disadvantage over a geographic unit), (2) relative deprivation (i.e., economic inequality), and, more recently, (3) concentrated deprivation/disadvantage (i.e., the spatial distribution and isolation of economic disadvantage). It is this latter explanation, the spatial distribution of economic disadvantage, which has been the focus of several recent studies of the structural determinants of violent crime.

Wilson's notion of concentrated disadvantage is an extension and elaboration of the pioneering work of Shaw and McKay (1942) and social disorganization theory. Wilson's core thesis is that *two* forms of residential segregation in America—racial and economic segregation—have converged in recent decades to produce severe social isolation among some black

communities. Transformations to the economy, including restructured occupations, relocated industries, and the out-migration of the middle- and working-class residents from the central city to the suburbs, has contributed to the latter form of segregation (Wilson, 2003). This severe social isolation (defined by Wilson as the lack of sustained interaction with mainstream individuals and institutions (Wilson, 1987:60)) is conducive to higher homicide rates because of the lack of social control mechanisms to inhibit such behavior and the presence of factors that encourage it (Krivo and Peterson, 1996). Included among these factors are: a weakened labor force attachment by the isolated poor (due to a lack of successful role models in these communities and the lack of stable and rewarding employment opportunities); decreased opportunities to reasonable mortgages, insurance, consumer, auto, college, and entrepreneur-based loans; housing loss; lax enforcement of housing codes leading to fewer quality housing options (including housing projects); a weakened social stigmatization associated with arrest, conviction, and incarceration due to isolation from middle-class citizens (see also Anderson, 1978); and disproportionate cuts in public services to poor communities because of the anemic political power of the poor (Wilson, 1987). Kurbin and Weitzer (2003) suggest that the lack of adequate police protection in poor communities contributes to a mentality that supports the informal resolution of disputes because of the lack of adequate policing services. The isolated poor also lack "access to reliable information concerning the labor market, schools, apprenticeship programs, financial markers, and so on" (Wilson, 2003:1106). Such information is critical for people to make "wise" decisions about their lives, their prospects for the future, and so forth (Wilson, 2003). Thus, Wilson (2003) argues that the outcomes of concentrated disadvantage are both structural (lack of access to jobs, mortgages, etc.) and social-psychological (low aspirations, negative social dispositions). Violent behavior is seen as both an adaptive and normative response in such concentrated disadvantaged communities and a behavior for which there are few and ineffective social control measures available to prohibit. Indeed, it is the notion that violent crime is an adaptive response that distinguishes Wilson's thesis from "culture of poverty" theses that emphasize the internationalization of norms that promote criminal behavior (Sampson and Wilson, 1995:51).[1]

Clearly, one major implication of Wilson's notion of concentrated disadvantage is that poverty concentration can help explain the relatively high rates of violence in many black communities.[2] Correspondingly, several tests

[1]For an excellent extended discussion of how poverty concentration produces urban violence, see Lee (2000).

[2]It should be noted that our review focuses on examinations of the specific hypothesis, derived from Wilson's work, that poverty concentration is associated with homicides. Other research that has been inspired by Wilson's work, such as Shihadeh and Ousey's (1998) work examining the connection between industrial restructuring and race-specific homicides and Bellair, Roscigno and McNulty's (2003) work on the local labor market structure and violent

of this proposition have been conducted. These studies can be categorized according to the level of aggregation being evaluated—neighborhood- or community-level studies—that examine whether poverty concentration is associated with variation in violent crime rates across neighborhoods, and intercity/metro-area-level studies that examine the predictive utility of poverty concentration for explaining violent crime rates across cities or urban areas.

Studies focusing on the neighborhood or community level have generally found an association between poverty concentration and neighborhood crime (e.g., Krivo and Peterson, 1996); however, these studies characteristically are limited by examining only one city or metropolitan area at a time. However, among those few studies that have examined *inter*city or metropolitan area race-specific homicide rates, the results are inconclusive—one study has found a link between poverty concentration and black homicide rates while another study has not. Parker and Pruitt (2000) failed to find that poverty concentration, measured by dividing the number of race-specific people living in Census tracts with poverty rates equal to or in excess of 40 percent by the size of the race-specific population in a given city, was a significant predictor of black homicide rates, although it was found to be salient in explaining white homicide rates—only absolute poverty was observed to predict black homicide rates. However, Lee (2000) found that the use of the p* isolation index as a measure of poverty concentration was a significant predictor of race-specific homicide arrest rates across 121 central cities. The isolation index employed by Lee captures the probability that a poor black (or white, for the other race-specific indicator) comes into contact with another poor person, regardless of race, in his or her same neighborhood. Hence, two different studies found inconsistent results regarding the association between poverty concentration and black homicide rates.

Furthermore, a recent study (Stretesky, Schuck, and Hogan, 2004) that examines the association between poverty measures, including the spatial clustering of poverty, and intercity violent crime rates failed to find a direct association between the two, although the authors did find evidence of an interaction effect involving poverty clustering and overall poverty rates and homicide rates. Unfortunately, the authors did not examine race-specific violent crime rates, so the question of whether the conditioning effect predicts race-specific homicide rates remains unanswered. Nonetheless, these three studies raise questions about whether poverty concentration exerts a direct effect on black homicide rates.

delinquency, are considered beyond the scope of our review because our focus is on studies examining poverty concentration and homicide per se. We are in agreement, however, with Bellair et al.'s observation that such processes (i.e., industrial restructuring and local labor market dynamics) occur prior to such structural factors as poverty concentration (2003:8).

Economic Segregation

The use of poverty concentration as a measure of economic segregation has been challenged by Jargowsky (1996) for largely methodological reasons. According to Jargowsky, the use of a dichotomous measure of the spatial distribution of income (poor vs. not poor) has a couple of important limitations. First, it potentially confounds changes in the underlying income distribution with changes in the spatial organization. In other words, a shift in either the mean or the variance of an income distribution can "move" households from one category to another (e.g., "poor" to "not poor"), even though they have not moved from one neighborhood to another. Second, the line that separates poor from not poor (i.e., the definition of poverty) is somewhat arbitrary, especially since there is no adjustment for cost of living. Thus, families that are defined as poor in one city may actually have more buying power than a similar family defined as "not poor" residing in a city with a higher cost of living. Likewise, such a measure does not capture differences in the availability of benefits like food stamps or other forms of assistance that may ameliorate some of the effects of earning below the poverty line (Jargowsky, 1997:22). Additionally, the use of poverty concentration as a measure of the spatial distribution of economic disadvantage raises another concern: using a measure with a dichotomous construct of economic differences (poor vs. nonpoor) fails to capture potential homogeneity among neighborhoods for other economic strata than simply the impoverished. For example, neighborhoods that are comprised of largely working poor may also lack the actors and the resources necessary to produce conditions of low homicide rates, yet a measure that captures only poor versus all other economic groups would fail to capture the potential criminogenic consequences of the structural conditions of such neighborhoods.

Jargowsky recognized the limitations of poverty concentration as a measure of economic segregation in defining his neighborhood sorting index (NSI). His measure is a correlation ratio, calculated as the between-tract variance of household income over the total variance of household income in the city. He argues that such a measure is more suitable for capturing economic segregation since it is based on deviations and is invariant with respect to the mean and variance of the income distribution. Furthermore, such a measure of economic segregation "gives more emphasis to areal units that differ sharply from the mean . . . this weighting is appropriate because often the concern is with the most highly segregated neighborhoods" (Jargowsky, 1996:989).

Our study represents an exploratory examination of the association between economic segregation (as measured by Jargowsky's NSI) and race-specific homicide rates, controlling for other salient predictors. We propose that this measure, which is a more comprehensive measure of the relative isolation of people based on income than poverty concentration, will have greater predictive utility in explaining urban-area variation in race-specific homicide

rates. However, it is possible that methodological concerns aside, both indicators of the spatial distribution of economic resources will have similar predictive utility for explaining variation in race-specific homicide rates.

Data and Methods

The data used in this study are derived from two sources: the 2000 Census and the Supplemental Homicide Report for the years 1999–2001. Similar to past research in this area (e.g., Ousey and Augustine, 2001), we examine urban areas that have populations of at least 100,000 people and 2,000 blacks. Using Metropolitan Statistical Areas that reported homicide data for the years 1999–2001 produced 166 urban areas for analysis.[3] It is important to acknowledge that the examination of structural factors at this level of aggregation may leave the findings produced from these analyses inconsistent with recent studies that have examined within-city variation in homicide rates. However, there exist (at least) two reasons to examine these analyses at this level of aggregation. First (and most importantly), Jargowsky's measure of economic segregation is constructed to capture the relative distribution of income across neighborhoods in a city or urban area, like most measures of residential segregation. Examining only central city data would likely lead to biased estimates of the association between economic segregation and homicides because much of the isolation of affluence from the poor and working class would not be captured using the smaller geographic unit. Second, there exists some evidence that structural predictors of homicides produce similar results across different levels of aggregation (Land, McCall, and Cohen, 1990). Nonetheless, we agree with Ousey and Augustine's (2001:942) sentiments that these analyses may be obscuring within-urban-area variation that may produce distinct differences in findings assessing the association between structural measures and neighborhood-level homicide rates (see also Parker, 1989:994–96).

Dependent Variables

Three dependent variables are analyzed in this study: overall, white, and black homicides. Overall homicides are the number of homicides reported to the police over a three-year period (1999–2001) divided by three. Because of missing data on the race of the offender in the Supplemental Homicide Reports, we employ an algorithm (for details, see Fox, 2004) that imputes the

[3]Arguments have been fostered in the past about the strengths and weaknesses of using MSAs versus central cities as the unit of analysis for studies of variation in homicide rates. We use MSAs as the unit of aggregation because of the nature of economic segregation itself—the failure to include suburban areas where many middle- and higher-income families reside may confound any measure attempting to capture the spatial distribution of income in an urban area. However, we encourage future analyses to examine whether the same pattern of findings is maintained when examining central cities as the unit of analysis.

race of the offender based on other incident characteristics (see also Pampel and Williams, 2000).[4] The race-specific homicides were produced by this imputation procedure and divided by three to provide an average over the three-year period. The averaging of multiple years of homicide data is utilized to smooth out fluctuations in the pattern of homicides and is consistent with many prior studies (e.g., Peterson and Krivo, 1999; Phillips, 2002).

Independent Variables

Economic Segregation. We employ two measures of economic segregation: the neighborhood sorting index and poverty concentration. Jargowsky's *neighborhood sorting index* is the square root of the ratio of the variance in household income between Census tracts divided by the total variance of household income for a given MSA.[5] Using this measure of economic segregation, if all of the neighborhoods (i.e., Census tracts) for a given MSA have the same mean household income, there would be no economic segregation in the MSA (Jargowsky, 1995:9). Greater values indicate that neighborhood deviations from the MSA's mean household income are proportionately larger relative to the MSA's standard deviation of household income, indicating greater economic segregation. Poverty concentration is captured by the isolation index for poverty, as used by Lee (2000).[6] It captures the probability of a poor person coming into contact with another poor person in the same Census tract. Greater values on this measure represent greater levels of poverty concentration and the spatial isolation of the poor.

Scholars have noted the deleterious consequences that racial residential segregation has had for blacks in urban areas, including the concentration of

[4]Offender race was missing in 29.5 percent of the original cases considered in the analyses.

[5]

$$NSI = \frac{\sigma N}{\sigma H} = \frac{\sqrt{\frac{\sum_{n=1}^{N} h_n * (\bar{y}n - \bar{y})^2}{H}}}{\sqrt{\frac{\sum_{i=1}^{H} (yi - \bar{y})^2}{H}}},$$

where y is income, i indexes households, n indexes neighborhoods, h_n is the number of households in neighborhood n, and H and N are the total number of households and neighborhoods, respectively. We employ the same assumptions and derive an estimate of total variance of household income for a given MSA utilizing the same procedures as Jargowsky (for details, see Jargowsky, 1995:Appx. A).

[6]The isolation index is calculated as:

$$P^* = \sum_{j=1}^{N} \left(\frac{x_j}{x}\right)\left(\frac{xt_j}{t_j}\right),$$

where P^* represents the isolation index, x_j is the number of poor persons in tract j, xt_j is the total number of poor persons in the MSA, X is the total number of persons in the MSA, and t_j is the total population in tract j. Indices for the race-specific homicide rate models were constructed using race-specific information.

black poverty (Massey and Eggers, 1990), female-headed households, and male unemployment (Krivo et al., 1998). Racial residential segregation serves to attenuate social mobility for racial and ethnic minorities and the poor. As Peterson and Krivo (1999:486) acknowledge, racial residential segregation "sets in motion patterns of community disorganization and diminished social control that have deadly consequences for African Americans." Racial segregation is measured by the index of dissimilarity (white vs. black) for the city. It is the percentage of black residents who must move in order for the percent black in each Census tract in the city to be equivalent to the percent black in the entire city. Scores range from 0 to 1 with larger values representing more racial segregation. The index of dissimilarity is commonly used to measure unevenness in the distribution of blacks and whites across a given area (Massey and Denton, 1987).

Other Measures. To assess the veracity of the association between economic segregation and homicide, we are guided by a three-prong strategy suggested by Phillips (2002:354): (1) theory; (2) prior studies of homicide rates; and (3) concerns regarding multicollinearity. We provide both overall and race-specific measures for most of the concepts.[7] We examine three factors representing structural disadvantage (described before as absolute deprivation): (1) percent of residents below the poverty line; (2) percent of families headed by females with children under the age of 18; and (3) the percentage of civilian noninstitutionalized males above the age of 16 who are unemployed or not in the labor force (Krivo and Peterson, 1996). A principal components analysis revealed that these three measures produce high factor loadings, suggesting redundancy. Thus, z score transformations of each of the three measures are summed to form an overall index of absolute structural disadvantage (alpha = 0.86), and two race-specific indices of absolute structural disadvantage (alpha = 0.81 for whites; alpha = 0.51 for blacks).

Other controls incorporated into these analyses include whether the state is located in the South, percent black, percent male (including race-specific measures), the percentage of the population that is young (i.e., 15–24; including race-specific measures), percent college graduates (including race-specific measures), population density, and a measure of residential stability—the percent of residents who have lived in the same residence for the past five years.[8]

Although Jargowsky (1996:988) notes that economic inequality is controlled for in the NSI, we also consider the predictive utility of traditional measures of economic inequality, both in models with and without economic segregation included, to assess whether it is economic segregation or simply relative deprivation that is associated with homicide rates. The overall Gini coefficient

[7]The denominator for the race-specific measures is the size of the race-specific population.

[8]The natural log of population density was also examined as a predictor but did not significantly alter any of the findings.

TABLE 1

Means and Standard Deviations of Variables Used in the Analysis ($N = 166$ MSAs)

Variable	Mean	*SD*
Overall homicides	39.99	52.14
Black homicides	21.94	38.27
White homicides	18.05	24.11
Economic segregation	0.44	0.10
Racial segregation	0.51	0.12
Structural disadvantage	0.00	2.54
		2.32
		1.93
South	0.48	0.50
Population density	271.83	196.12
Percent male	48.91	1.04
	49.01	*1.08*
	50.32	**5.54**
Percent 15–24 year old	15.19	3.24
	14.35	*3.64*
	17.31	**2.52**
Percent black	12.88	11.89
Population size (natural log)	12.81	0.87
	12.54	*0.88*
	10.28	**1.38**
Percent college	14.39	3.84
	15.73	*4.15*
	8.67	**3.33**
Residential stability	52.65	6.17
	54.23	*6.49*
	44.03	**9.89**
Poverty concentration (mean-centered)	0.00	0.97
		0.98
		0.75
Economic inequality	0.410	0.023
	0.410	*0.020*
	0.456	**0.034**

Bold indicates means and standard deviations for blacks, *italic* indicates means and standard deviations for whites.

was calculated for the overall homicide rate model, while race-specific Gini coefficients were calculated for the models predicting race-specific homicide rates.[9] Table 1 presents the means and standard deviations for the variables considered in the analyses.

[9]The Gini coefficient is the proportion of the total area below the 45-degree line that lies above the Lorenz curve, which plots the cumulative percent of households against the cumulative percent of household income. Another common measure of economic inequality, the ratio of white to black median household income, was also considered in additional analyses (not shown) and was not found to be a significant predictor.

Analytic Strategy

Our dependent variables consist of three relatively infrequent occurrences—total, white offender, and black offender homicides. Osgood (2000) has argued that a negative binomial model is preferable to ordinary least squares regression because of the skewed and relatively rare nature of homicide events.[10] Since we wish to evaluate homicide rates and not counts of homicides, however, we must convert the counts of homicides to the equivalent of a rate for each city. We employ the technique suggested by Osgood and include an offset—the natural logarithm of the size of the relevant population (and race-specific populations for the race-specific models)—to convert the counts to equivalent rates (Osgood, 2000; MacDonald and Gover, 2005; Ousey and Augustine, 2001). Finally, because regression diagnostics indicated the presence of influential cases, robust standard errors are estimated using the Huber/White/sandwich estimator of variance.

Results

Table 2 presents the negative binomial regression results predicting the overall homicide rate, the white homicide rate, and the black homicide rate.[11] The first two columns report the results of the analyses predicting the overall homicide rate, with the first model omitting the economic segregation measure. Overall, six (of nine) predictors reach statistical significance: structural disadvantage, living in the South region of the United States, percent of the population between the ages of 15 to 24, percent black, population size, and residential stability. Consistent with prior research, southern metropolitan areas with relatively larger black populations, those that have greater overall structural disadvantage, and urban areas with less residential stability have higher overall homicide rates, controlling for other factors. The only surprising finding among the significant predictors was the inverse relationship between percent young and the overall homicide rate. However, this may be due to fact that homicide is one violent crime that has an older mean age than other crimes of violence.[12]

[10]Consistent with Osgood (2000) and others, we employ a negative binomial model instead of a Poisson-based regression model because of the assumption of the latter model that all the meaningful variation is accounted for in the linear model.

[11]Variance inflation factors (VIF) were calculated for all the estimated models. Serious collinearity problems do not occur when VIFs are less than 10 (Gujarati, 1995:339). The VIFs for individual variables did not exceed 5 for any of the models displayed nor did the average VIF exceed 3 in any of the models, indicating that multicollinearity did not significantly impact our results adversely. The correlations for the predictor variables used in the analyses of the overall and race-specific homicide rates are available on request from the authors.

[12]The presumed relationship between age and homicides in cross-sectional studies has been called into question previously, in large part because of the failure to find a consistent relationship between the proportion of young people in the population and homicide rates (Land, McCall, and Cohen, 1990; Gartner and Parker, 1990). Indeed, Land, McCall, and

TABLE 2

Negative Binomial Regression Coefficients (and Robust Standard Errors in Parentheses) from Models Predicting White, Black, and Overall Homicides ($N = 166$ MSAs)

	Overall Homicide Rate	Overall Homicide Rate	Black Homicide Rate	Black Homicide Rate	White Homicide Rate	White Homicide Rate
Structural disadvantage	0.043**	0.034*	0.071*	0.074**	0.115***	0.102***
	(0.018)	(0.018)	(0.038)	(0.037)	(0.026)	(0.027)
South	0.218***	0.225**	0.027	0.015	0.319***	0.333***
	(0.089)	(0.085)	(0.149)	(0.147)	(0.103)	(0.102)
Percent males	0.060	0.071	0.050	0.049	0.004	0.009
	(0.117)	(0.115)	(0.031)	(0.030)	(0.052)	(0.053)
Percent 15–24 year olds	−0.055***	−0.049**	−0.080**	−0.071**	−0.076***	−00.069***
	(0.022)	(0.021)	(0.034)	(0.034)	(0.015)	(0.016)
Percent black	0.021***	0.021***	−0.006	−0.005	0.000	−0.002
	(0.004)	(0.004)	(0.006)	(0.007)	(0.005)	(0.005)
Population size (natural log)	1.054***	0.984***	1.067***	1.001***	1.070***	1.008***
	(0.102)	(0.120)	(0.065)	(0.077)	(0.063)	(0.068)
Population density	−0.000	−0.000	−0.000	−0.000	0.000	0.000
	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0002)	(0.0003)
Percent college graduates	−0.017	−0.031*	0.017	0.002	−0.021	−0.036**
	(0.019)	(0.017)	(0.022)	(0.023)	(0.016)	(0.016)
Residential stability	−0.028**	−0.020	0.004	0.010	−0.048***	−0.041***
	(0.013)	(0.014)	(0.011)	(0.011)	(0.012)	(0.013)
Racial segregation	0.755	0.451	0.612	0.333	−0.889*	−1.141**
	(0.533)	(0.479)	(0.582)	(0.607)	(0.511)	(0.474)
Economic segregation		1.439*		1.504*		1.260*
		(0.742)		(0.779)		(0.672)
Constant	−11.398	−11.869	−10.417	−10.521	−6.909	−7.012
Wald chi-square	1035.77***	1226.74***	990.08***	1048.05***	905.84***	979.93***

*$p \leq 0.1$; **$p \leq 0.05$; ***$p \leq 0.01$ (two-tailed tests).

The inclusion of the economic segregation measure (Table 2, Column 2) reveals that economic segregation is a statistically significant predictor of the overall homicide rate, controlling for other predictors of homicide. In other words, metropolitan areas that are more economically segregated have higher homicide rates than less economically segregated areas. Additionally, the inclusion of the economic segregation measure also reveals a statistically significant association between percent college graduates and the dependent variable—areas with a relatively lower rate of college graduates have a higher overall homicide rate.

An inspection of the models predicting the white homicide rate (Table 2, Columns 5 and 6) reveals a similar pattern to the findings as revealed in the overall homicide rate models, with a couple of important differences. In the baseline model predicting white homicides (Column 5), five of the significant predictors identified in the models predicting overall homicide rates remain significant and are associated with white homicide rates in the same direction. Urban areas beset by relatively higher rates of structural disadvantage among white residents, southern urban areas, metro areas with relatively fewer young white residents, and areas having less residential stability have higher white homicide rates. However, one factor that was a significant predictor of overall homicide rates—percent black—is not predictive of white homicide rates.

Somewhat unexpected is the finding that the level of racial segregation is a significant predictor of white homicide rates—urban areas with higher levels of racial segregation have *lower* rates of white offender homicides. One possible explanation is what Messner and Golden (1992:424) referred to as a "relative gratification/reduced aggression" explanation. In short, these authors extended the arguments of Blau and Schwartz (1984:176), who suggested that greater racial inequality could potentially benefit whites, both materially and psychologically. In the reverse of the logic of relative deprivation theory, whites being advantaged (relative to blacks) may serve to reduce frustrations and hostilities among whites, which Messner and Golden argued would suggest an inverse association between white violent crime rates and indicators of racial inequality.[13]

Cohen (1990), in their seminal study in which they reviewed the findings of 20 years of research exploring the structural covariates of homicide rates, found that a minority of studies reviewed found evidence of a positive association between age structure and homicide rates—the majority of studies either failed to find a significant relationship between the two or found evidence of a negative effect between age structure and homicide rates.

[13]One anonymous reviewer raised the question of whether racial segregation can be viewed as racial inequality or not, especially given the relatively low correlation between it and the indicators of economic inequality. We follow the arguments of Peterson and Krivo (1993:1004), who wrote that "residential segregation between blacks and whites is a pervasive aspect of racial inequality in the U.S. Numerous studies report high levels of racial residential segregation in U.S. cities and suburbs that cannot be explained by black-white income differentials." Additionally, see Krivo et al. (1998:467), who wrote: "but just as segregation disadvantages blacks in this way, it *advantages* whites by geographically buffering them from much higher levels of black disadvantage. Indeed, at times segregation actually reduces the concentration of white disadvantage."

The inclusion of the economic segregation measure (Table 2, Column 6) reveals that it is also a significant predictor of white homicide rates—cities with greater economic segregation are likely to have greater rates of white homicides. Hence, while racial segregation is associated with fewer homicides committed by whites (per capita), economic segregation is associated with a higher white homicide rate.

The results of the models predicting black homicide rates (Columns 3 and 4) reveal fewer significant predictors of the dependent variable than the overall or white homicide models. Only two predictors—the level of black structural disadvantage and percent young blacks—were found to be significant predictors of black homicide rates (beyond the log of the black population). Racial segregation was not found to be a significant predictor of black homicide rates, controlling for other structural predictors. However, the inclusion of the economic segregation measure (Column 4) demonstrates the utility of Jargowsky's measure for predicting race-specific homicide rates. Urban areas with higher levels of economic segregation have higher black homicide rates.

To rule out the possibility that the neighborhood sorting index is merely a redundant measure of poverty concentration, Table 3 presents models that include poverty concentration as an indicator of economic segregation instead of the neighborhood sorting index.[14] Since the focus of this table is on the relative contributions of the poverty concentration, only that coefficient and (when included) the economic segregation coefficient are reported in Table 3. The results suggest that for overall homicide rates, poverty concentration is not a significant predictor of the dependent variable. However, the inclusion of the economic segregation measure with the model that includes poverty concentration demonstrates that only economic segregation is a significant predictor of the overall homicide rate.[15]

In regard to the race-specific dependent variables, a more complex pattern emerges. For the models predicting black homicides, poverty concentration is also not found to have an association with black homicides. However, economic segregation is found to be a significant predictor of black homicides, even when including it with a measure of poverty concentration. However, in

[14]As was the case in Parker and Pruitt's (2000) analysis of poverty concentration and race-specific homicides, we found that our measure of poverty concentration was highly correlated with both the poverty rate and the index of structural disadvantage (which includes % poverty as one of the indicators). Because of concerns about multicollinearity, and because our primary interest is in evaluating whether poverty concentration is a suitable substitute predictor of homicides instead of the economic segregation measure, we exclude the index of structural disadvantage from the following analyses. However, parallel analyses that include the poverty concentration measure with the structural disadvantage index were also conducted (available on request), with similar results—economic segregation proves to be a more robust predictor of race-specific homicide rates than poverty concentration.

[15]We also considered the overall indicator of poverty concentration instead of the race-specific measures, and found similar results as to those reported. Furthermore, we also considered the overall Gini coefficient in lieu of the race-specific measures of economic inequality, with similar results as those reported.

TABLE 3

Negative Binomial Regression Coefficients (and Robust Standard Errors in Parentheses) from Models Including Poverty Concentration Predicting White, Black, and Overall Homicides ($N = 166$ MSAs)[a]

Key Predictor Variables	Overall Homicide Rate	Overall Homicide Rate	Black Homicide Rate	Black Homicide Rate	White Homicide Rate	White Homicide Rate
Poverty concentration	0.122	0.080	− 0.080	− 0.107	0.235***	0.192**
	(0.076)	(0.075)	(0.106)	(0.109)	(0.065)	(0.070)
Economic segregation		1.396*		1.574*		1.351*
		(0.747)		(0.829)		(0.747)
Wald chi-square	1055.69	1209.02	1000.57	1044.16	849.44	903.25

[a]Control variables include region, percent males, percent 15–24 year olds, percent black, population size (logged), racial segregation, density, percent college graduates, and residential stability.

*$p \leq 0.1$; **$p \leq 0.05$; ***$p \leq 0.01$ (two-tailed tests).

TABLE 4

Negative Binomial Regression Coefficients (and Robust Standard Errors in Parentheses) from Models Including Economic Inequality Predicting White, Black, and Overall Homicides ($N = 166$ MSAs)[a]

Key Predictor Variables	Overall Homicide Rate	Overall Homicide Rate	Black Homicide Rate	Black Homicide Rate	White Homicide Rate	White Homicide Rate
Economic inequality	0.026	− 2.171	− 0.489	− 0.535	7.204**	5.154**
	(2.663)	(2.585)	(2.091)	(2.203)	(2.675)	(2.598)
Economic segregation		1.843**		1.462*		1.788**
		(0.748)		(0.791)		(0.689)
Wald chi-square	1024.21	1265.50	1008.57	1054.00	757.39	859.00

[a]Control variables include region, percent males, percent 15–24 year olds, percent black, population size (logged), racial segregation, density, percent college graduates, and residential stability.

*$p \leq 0.1$; **$p \leq 0.05$; ***$p \leq 0.01$ (two-tailed tests).

the models predicting white homicides, the use of the measure of poverty concentration or economic segregation may be somewhat redundant—both are predictive of these dependent variables. Indeed, the addition of the economic segregation measure to the model that includes poverty concentration leads to an 18 percent reduction in the magnitude of the association between poverty concentration and white homicides. Nonetheless, it appears that isolation by income and isolation of the impoverished both have predictive utility for understanding variation in white homicide rates. Overall, these findings parallel the findings of Parker and Pruitt (2000), who found that poverty concentration was predictive of white, but not black, homicides.

Finally, in order to rule out the possibility that it is economic inequality, and not economic segregation, that is associated with homicide rates, Table 4 examines the same models as presented in Table 2 with two major exceptions: a measure of economic inequality is first substituted for economic segregation (Columns 1, 3, and 5) and then is included with the measure of economic segregation (Columns 2, 4, and 6). Since the focus of this table is on the relative contributions of the economic inequality and economic segregation measures, we focus on those factors from Table 4. A quick inspection of the models reported for both the overall homicide rates and the black homicide rates reveals that the substitution of an economic inequality measure for the economic segregation measure does not appear to be a suitable replacement—neither the overall Gini coefficient nor the black Gini coefficient are found to be significant predictors of the dependent variables in the baseline models (Columns 1 and 3). Additionally, the inclusion of the economic inequality variable to the models with economic segregation included does not degrade the strength of the association between the NSI and either of the overall or black homicide rates. However, the white Gini coefficient is found to have a significant association with the white homicide rate. Nonetheless, the inclusion of the economic segregation measure to this model reveals that both economic inequality and economic segregation predict white homicides. Again, the inclusion of the economic segregation measure led to a 28 percent reduction in the magnitude of the economic inequality coefficient, consistent with Jargowsky's statement that economic inequality is controlled for in the NSI.

Conclusion

One of the great quandaries of criminological research is the lack of consistent and compelling evidence supporting an association between structured economic deprivation and homicide rates for both blacks and whites. Our present research seeks to revisit this quandary. We evaluate the predictive utility of two measures of the spatial distribution of economic resource—Jargowsky's (1996) neighborhood sorting index and a measure of poverty concentration—controlling for other salient structural predictors of

homicide rates. Our research uncovered a consistent relationship between Jargowsky's measure of economic segregation and homicide, including both white and black homicide rates. However, we failed to find that poverty concentration was a significant predictor of black or overall homicide rates, although it was predictive of white homicide rates.

Explaining why poverty concentration is *not* a significant predictor of variation in black homicide rates is a somewhat difficult venture, given the popularity of Wilson's thesis on concentrated disadvantage. Nonetheless, we think it prudent to emphasize that the nature of structured disadvantage for blacks in the urban areas is unique and complicated. For example, Sims (1999) found that higher income blacks are less likely to be spatially isolated from lower income blacks than whites of different economic strata. Indeed, Pattillo-McCoy (1999) claimed that a central tenet to Wilson's thesis, the out-migration of middle-class blacks as a contributor to the development of the black urban underclass, is not supported by empirical evidence. She found that the black middle class tends to live in communities spatially adjacent or close to those places occupied by more impoverished blacks. It may be the case that economic segregation more aptly captures isolation than poverty concentration measures because economic segregation is measuring the isolation of people across the income spectrum. By focusing on just the spatial distribution of poverty, poverty concentration measures may not be able to adjudicate between metro areas where the poor are clustered but the rest of the area is relatively heterogenous, versus metropolitan areas where the middle class and upper class live virtually isolated from any other group.

Although not highlighted in the results section, it is also important to note that the index capturing absolute deprivation was also found to be predictive of black, white, and overall homicide rates. Although this index is comprised of three measures of disadvantage (percent poverty, percent female-headed household, and percent unemployed), the use of such an index is supportive of recent research that is establishing that such a measure has predictive utility for black and white homicide rates (MacDonald and Gover, 2005; Kurbin and Weitzer, 2003; Krivo and Peterson, 1996). In short, our research suggests that both the overall extent of disadvantage and the spatial distribution of income are associated with homicide rates.[16] This is particularly compelling in light of the fact that very little research examining the structural factors associated with race-specific homicides has been conducted

[16]It should be emphasized that Jargowsky's measure of economic segregation is a concept that is most applicable to large urban geographical units. One way of contemplating the relationship between economic segregation and measures of economic disadvantage at the neighborhood level is to consider how the distribution of race is measured. At the city or urban-area level, race is typically measured by some segregation index (we use the index of dissimilarity), whereas at the neighborhood level, race is measured simply by the percent of black residents in the neighborhood. Employing similar logic to economic segregation allows one to envision the compatibility between our research and research that has explored intra-city/urban area variation in homicide rates using measures of economic disadvantage such as percent poverty.

with data from the 2000 decennial Census. Our results provide additional evidence that the index of disadvantage that includes family structures combined with economic indicators is a robust predictor of homicide rates.

Despite the compelling nature of our results, our findings are best depicted as preliminary in nature. First and foremost, the use of Jargowsky's measure, while a "pure" measure of economic segregation (1995:996), is best seen as providing more evidence to a small but growing number of studies that find that the spatial distribution of economic resources may be an important ingredient in understanding how structured disadvantage is associated with black violent crime. Second, it is important to note that while our research has established an association between economic segregation and violent crime, we have not fully attended to the issue of endogeneity. Indeed, a core thesis of Wilson's discussion was that the exodus of middle- and working-class families from high crime areas within cities exacerbated the problems of these communities, leading to surges in violent crime in such concentrated disadvantaged areas. Hence, increases in violent crime (at the neighborhood level) may lead to greater economic segregation at the city level. However, the result of such reciprocity remains logically consistent with the core thesis—that greater economic segregation inspires more violent crime. Nonetheless, future research should attempt to model these reciprocal relationships to fully understand the relationship between economic segregation and crime. Third, while our selection of MSAs as the unit of analysis is justified given the nature of economic segregation (i.e., many upper-income residents move to surburban areas outside of the central city), such a unit of analysis may not be optimal for testing many of the other potential predictors of homicide rates included in our models, as has been suggested in the past (Parker, 1989). Further research should examine whether the neighborhood sorting index is a robust predictor of homicides across central cities. And finally, our research only examines the association between economic segregation and two racial groups (blacks and whites). Given the emergence of Latinos/Hispanics as a large minority group in the United States, it is important to assess whether our models including structural factors predict variation in these groups' homicide rates as well.

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