Neighborhood Racial/Ethnic Concentration, Social Disadvantage, and Homicide Risk: An Ecological Analysis of 10 U.S. Cities

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ABSTRACT *Homicide is one of the leading causes of death among African-American and Hispanic men. We investigated how neighborhood characteristics associated with social disadvantage explain racial/ethnic homicide gaps in 10 U.S. cities. The test hypotheses were that (1) higher concentrations of African-Americans and Hispanics would be associated with higher homicide rates and (2) the relationship between racial/ethnic concentration and homicide would be attenuated after adjusting for neighborhood characteristics (e.g., unemployment, median household income, low educational attainment, and female headship). The test hypotheses were examined using separate Poisson regression models, which adjusted for spatial autocorrelation. Homicide rates were greater in neighborhoods with higher concentrations of African-Americans and Hispanics than in other groups, and the association of neighborhood racial/ethnic concentration with homicide was reduced after adjusting for neighborhood social disadvantage variables, especially percent female head of household and percent persons with less than a high school education. We also found that the relationship between neighborhood racial/ethnic concentration and homicide was explained more by social disadvantage variables in some cities than in others. Based on our findings, policy makers may wish to consider implementation of policies that (1) expand early childhood education programs and higher education opportunities and (2) encourage economic and community development initiatives in socially disadvantaged neighborhoods.*

KEYWORDS *Racial/ethnic concentration, Homicide, Social disadvantage, African-American, Hispanic, Asian*

INTRODUCTION

Homicide is one of the leading causes of death among young African-American and Hispanic men. Among men 15 to 34 years of age in the U.S. in 2004, African-American men were 12 times more likely than Caucasian men to be victims of homicide (45.5 per 100,000 vs. 3.8 per 100,000) and Hispanic men were four times more likely than Caucasian men to be homicide victims (14.9 per 100,000 vs. 3.8 per 100,000).¹ The high homicide rate among young African-American and Hispanic men should be cause for concern among policy makers. National crime data suggest that homicide is on the rise again after a decade of decline, especially in midsize U.S. cities.²

Various sociological theories of crime have been proposed to explain racial/ethnic homicide differentials.³ For example, social disorganization theory posits that

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homicide rates are high in African-American neighborhoods because they are more likely than other groups to live in socially disadvantaged neighborhoods.^{4,5} Socially disadvantaged neighborhoods have limited resources to secure safe and affordable housing and fight crime. These neighborhoods often include large numbers of single-parent families that have fewer adults to provide adequate supervision, scrutinize neighborhood activities, and thwart criminal activities.^{6,7} Also, socially disadvantaged neighborhoods with lower educational attainment have fewer patrolled streets and employment opportunities for youth who are at risk for engaging in crime.⁸

Social disorganization theory suggests that African-Americans and Hispanics are not inherently predisposed to violent crime; rather, it is the social conditions where they live that lead to high homicide rates. Social disorganization theory implies that if we take into account the socioeconomic characteristics of neighborhoods where African-Americans, Hispanics, Asians, and Caucasians live, racial/ethnic homicide differentials will be reduced or disappear. However, few ecological studies have tested this hypothesis using homicide victimization data.⁹⁻¹³ Gjelsvik and colleagues⁹ investigated the effects of residential neighborhood level social and economic conditions on the risk of homicide victimization and found that the relative difference in homicide risk among African-American, Hispanic, and Caucasian men was attenuated when census block socioeconomic characteristics were considered (e.g., percent female head of household, percent unemployed, and percent low education). Using data from the 1990 Census, Phillips¹³ analyzed the contribution of various neighborhood socioeconomic characteristics in explaining racial/ethnic differences in homicide victimization. Phillips found that most of the white-black homicide differential was explained by differences in family structure and socioeconomic characteristics (e.g., percent males unemployed).

Ecological studies have also shown that neighborhood characteristics explain racial/ethnic gaps in homicide and overall mortality even when the individual socioeconomic characteristics of victims are taken into account.^{10,14,15} For example, Cubin and colleagues¹⁴ examined both individual and neighborhood correlates of injury mortality using three sources of data: the National Health Interview Survey (1987-1994), the National Health Interview Survey/Multiple Causes of Death Public Use Data File (1987-1995), and the 1990 U.S. Population Census. Homicide victims were identified by matching characteristics common to both the NHIS and the National Death Index, which contains all U.S. death certificates. Cubin and colleagues found that the homicide differential between African-American and Caucasian adults was reduced considerably when neighborhood characteristics (e.g., low family income, high proportions of poorly educated persons, female headship) were introduced after adjusting for the individual socioeconomic status of victims.

Ecological studies drawing on sociological theories of crime suggest that geography does indeed matter. However, the research is not without flaws. First, ecological studies of homicide victimization using multilevel data (i.e., individual and neighborhood level data) may not always include those at greatest risk of homicide victimization (i.e., young, inner-city African-American and Hispanic men) because they rely on probability samples of the general population to identify homicide victims.¹⁴ Second, ecological studies of homicide victimization using multilevel data are based on the location of the victim's residence rather than on the location where the homicide occurred, which may not be the same.^{9,10,14}

We investigated how neighborhood level socioeconomic characteristics associated with social disadvantage explain racial/ethnic homicide gaps in 10 U.S. cities. The test hypotheses were that (1) higher neighborhood concentrations of African-Americans

and Hispanics would be associated with higher homicide rates and (2) the relationship between neighborhood racial/ethnic concentration and homicide would be attenuated after adjusting for neighborhood characteristics such as unemployment rate, percent persons with less than a high school education, median household income, and percent female head of household (i.e., female headship). In contrast to previous studies,^{9,10,14} we utilized city-wide data based on police reports and focused on where the homicide occurred rather than on where the victim lived at the time of the homicide.

METHODS

The Data

Data for this analysis come from the Malt Liquor and Homicide (MLH) study, a 3-year ecological study designed to examine the relationships between neighborhood racial/ethnic concentration, alcohol and malt liquor availability and promotion, and homicide.¹⁶ Results reported here are based on the MLH homicide data collected city-wide between 2003 and 2005.

The primary unit of analysis is the U.S. census block group. A census block group consists on average of about 400 households or about 1,200 individuals and is roughly 1 to 2 mi².¹⁷ Census block groups were selected because they are relatively homogeneous and studies have shown that census-derived measures at smaller units of analysis are more closely related to health outcomes.^{15,18,19}

Study Communities

Our sample consists of 3,915 census block groups in 10 cities including Oakland, San Francisco, Santa Ana, St. Paul, Minneapolis, Atlanta, Baltimore, Boston, Kansas City, KS, and Kansas City, MO. These 3,915 census blocks summarize the average household characteristics of about 4.54 million individuals in the study cities. The cities were chosen because they have similar population sizes (under one million) and poverty rates (11–19%) and include large numbers of minority youth who are at increased risk of engaging in problem behaviors associated with violent crime.¹⁶

Data Collection and Measures

We obtained two types of data: (1) archival data on homicides collected city-wide and (2) census data on neighborhood characteristics. For our homicide data, we geocoded and matched them to census block groups in our 10 cities using an online geocoding service (TeleAtlas). All addresses that could not be geocoded to the street segment using this service were reviewed for accuracy. If necessary, these addresses were matched to census block groups manually using additional resources, such as Geographic Information System (GIS) maps of each city, to achieve a 99% match rate. Data collection activities for the MLH study were approved by the University of Minnesota, Institutional Review Board.

Homicide Homicide was our key dependent variable of interest. We collected information on the location, date, and time of each homicide at the end of each calendar year (2003–2005) from local police departments. We measured homicide in terms of number of homicides per population age 14 years and older given the high homicide rates among African-American and Hispanic youth. Population data were based on the 2000 U.S. Census. We selected homicide because homicide offenses are more likely to be accurately reported than other forms of violent crimes such as rape and assault.²⁰

Neighborhood Level Socioeconomic Characteristics We obtained census block group values for neighborhood racial/ethnic concentration (percent African-American, Hispanic, Asian, and Caucasian), the study's main independent variable, from the U. S. Census 2000 SF1 files. We contrasted the percent African-American with all other races/ethnicities. We also developed similar dichotomous measures for percent Hispanic, Asian, and Caucasian. Unemployment rate for persons 16 years and older, percent with less than a high school education for persons 25 years and older, median household income, and percent female head of household also served as covariates and measures of neighborhood social disadvantage. Data on these variables were obtained at the census block group level from the U.S. Census 2000 SF3 files.

Neighborhood characteristics such as population density, percent males aged 14 to 24 years of age, per capita expenditure on law enforcement, and number of police per capita also served as covariates because these variables are also related to homicide.²⁰⁻²² Data on unemployment, population density, and percent males aged 14 to 24 years of age were obtained from the 2000 U.S. Census. Operating expenditures on law enforcement and the number of police officers came from the 2000 Law Enforcement Management and Administrative Statistics (LEMAS) survey of State and Local Agencies with 100 or more police officers. Data on expenditures on law enforcement and number of police officers are per capita averages at the city level. For these two variables, we assigned each census block group the value of their respective city in 2000 for all 3 years.

Data Analysis

Data for these analyses are based on 3,915 census block groups in 10 U.S. cities. Data from geographical areas, such as census block groups, are subject to spatial autocorrelation, i.e., the tendency of data from nearby spatial units to be correlated or similar to one with the other.²³ We directly adjusted for the spatial similarities of the census block groups by including the average number of neighboring homicides as a predictor in our models.^{24,25} For example, if a particular census block group shared a boundary with five other census block groups with homicide counts of one, two, zero, zero, and zero, then the average number of neighboring homicides for the initial census block group would be $(1+2+0+0+0)/5=0.6$. Potential correlation over time was accounted for by including a linear time trend and a random intercept for each block group. All models were tested using the SAS Version 9.1, PROC GLIMMIX.

All Poisson regression analyses included 3,867 census block groups hence screening out 48 (i.e., $3,915 - 3,867 = 48$) census block groups with total population less than 100 to avoid extreme values. Test hypotheses were examined using separate Poisson regression models in which outcome data were counts of homicides. Each model incorporated the block group population greater than 14 years of age as a fixed offset variable, and therefore, homicide rates per person (>14 years old) are specifically being modeled.

First, a series of separate Poisson models were estimated to examine the association of neighborhood racial/ethnic concentration, unemployment rate, percent persons with less than a high school education, median household income, and percent female head of household with homicide counts (adjusted for year, mean homicide of spatially adjacent neighborhoods, proportion of males aged 14 to 24 years of age, area in square miles, and city). Next, a series of Poisson models were estimated that simultaneously included the different predictors of homicide counts to test our hypothesis that unemployment rate, percent persons with less than high school education, median household

income, and percent female head of household would attenuate the relationship between racial/ethnic concentration and homicide (adjusted for year, mean homicide of spatially adjacent neighborhoods, proportion of males aged 14 to 24 years of age, area in square miles, and city). A fixed effect for city is used in the regressions to fully adjust for contextual differences across cities, for example, gangs and policies regarding gun control. Observed city level covariates including number of police per capita and expenditure for law enforcement per capita were examined in relation to homicide rates aggregated to the city level using simple correlations as well as city level regression models controlling for each of the other aggregated city-wide demographic and socioeconomic factors.

In order to examine potential differences in the relationship between neighborhood level racial/ethnic concentration and homicide, city-specific Poisson regression models were also estimated. It is of interest to examine whether the mediation relationships (i.e., attenuation of neighborhood racial concentration effects controlling for other neighborhood socioeconomic factors) were more evident in some cities than in others. Coefficients in these Poisson models represent the log relative risk of homicide for a unit increase in each predictor.

RESULTS

Descriptive Results

Our neighborhoods or census block groups were on average more racially and ethnically diverse and had higher percentages of female-headed households and persons with less than a high school education than that nationally. However, the median household income of neighborhoods in the 10 cities was relatively similar to the approximate \$42,000 national average (Table 1).

Homicide rates in neighborhoods increased in some cities and decreased in others from 2003 to 2005. For example, homicide rates increased in Boston (8.5 vs. 19.5 deaths per 100,000 persons), but decreased in Atlanta (46.7 vs. 25.9 deaths per 100,000 persons). Homicide rates were highest in Baltimore and lowest in Santa Ana over the 3-year period (Table 2). Homicide rates nationally remained stable from 2003 to 2005.

The percent African-American in neighborhoods was strongly correlated with female headship ($r=0.75$), unemployment rate ($r=0.54$), low median household income ($r=-0.49$), and low education ($r=0.43$) and only moderately correlated with homicide victimization rate ($r=0.34$). Percent Hispanic in neighborhoods was also more highly correlated with persons with less than high school education ($r=0.44$) than with homicide victimization rate ($r=0.03$) Figure 1 describes the relationships between percent African-American, percent female headship, and homicide rate and shows that homicide rates were especially high in African-American neighborhoods ($>15\%$) with high rates of female headship ($>25\%$). Racial/ethnic concentration variables were negatively associated with each other, suggesting some degree of racial/ethnic isolation in the neighborhoods. For example, the correlation between percent African-American and percent Hispanic was 0.27.

Poisson Regression Results

The number of homicides occurring in spatially neighboring census block groups was a highly significant predictor in all Poisson regression models considered, indicating that higher homicide rates were found in census block groups that had higher homicide rates in neighboring census block groups. Higher concentrations of African-American and

TABLE 1 Neighborhood characteristics of selected cities, 2000

City	No. of census blocks	Population count	Percent African-American	Percent Hispanic	Percent Asian	Percent Caucasian	Percent female-headed family	Unemployment rate	Percent not completed high school	Median household income, 1999 (\$)	Per capita expense at city level	Num police per capita at city level
U.S. average			12.3	12.5	3.6	75.1	12.2	4.0	19.6	41,994		
Atlanta, GA	308	452,043	62.4	3.8	1.6	30.7	39.4	5.1	23.7	41,471	287	3.26
Baltimore, MD	710	651,154	65.9	1.6	1.3	29.4	43.3	8.1	32.3	31,453	355	4.66
Boston, MA	545	589,141	24.1	14.0	6.7	49.9	31.2	2.9	18.9	41,785	346	3.67
Kansas City, KS	151	146,915	31.6	15.9	1.5	48.1	27.9	7.2	25.9	33,494	218	2.41
Kansas City, MO	465	488,957	32.6	6.9	1.9	55.8	27.7	4.0	18.7	38,948	304	2.56
Minneapolis, MN	399	382,452	16.2	7.0	6.0	64.8	26.6	3.2	13.5	43,114	239	2.36
Oakland, CA	338	399,465	35.9	20.5	14.5	24.3	31.2	4.7	22.8	44,389	320	1.78
San Francisco, CA	575	776,733	7.0	13.2	29.3	46.5	18.6	2.8	14.4	62,240	329	2.87
Santa Ana, CA	166	365,673	1.4	70.7	9.3	16.7	15.6	4.6	44.6	45,404	239	1.10
St. Paul, MN	258	287,151	9.8	7.2	10.3	68.2	23.5	3.5	12.4	42,993	222	2.01

Summary statistics represent an average across census block groups for each city. Source: U.S. Census Bureau, 2000 Census SF3. A household is defined as one or more people living in a residence. A family is more than one person living together, either married or of the same bloodline. The head of a household is one of the people who owns or rents the residence and was indicated first on the census questionnaire. The census defines "family household" as a householder living with one or more persons related to her or him by birth, marriage, or adoption. The unemployment rate is the number of civilian unemployed divided by total civilian labor force for persons ages 16 or older

TABLE 2 Homicide rate per 100,000 population by city and year

	2003	2004	2005
U.S. average	57	55	56
Atlanta	46.7	40.7	25.9
Baltimore	63.1	66.1	59.7
Boston	8.5	15.5	19.5
Kansas City, KS	34.2	34.0	39.4
Kansas City, MO	32.5	41.5	39.9
Minneapolis	15.0	18.8	15.7
Oakland	38.4	34.2	33.3
San Francisco	17.7	19.1	19.1
Santa Ana	5.5	7.5	4.6
St. Paul	9.3	8.6	12.7

Homicide rate is for individuals aged 14 or older, and rates are averaged across census block groups for each city. Source: local police departments

Hispanics were associated with greater risk of being a homicide victim from 2003 to 2005 (Table 3, separate predictors). This was not the case in census block groups with a higher concentration of Asians and Caucasians. Additionally, unemployment rate, percent female head of household, and percent persons with less than a high school education were positively associated with homicide ($p < 0.0001$ for all three), whereas median household income was negatively associated with homicide ($p < 0.0001$). When comparing the separate predictors models and model 1 in Table 3, we see that a large amount of the individual effect found for the education, household income, and female headship variables is explained by their mutual relationships with each other. For example, the effect (relative risk) of percent of persons not completing high school was reduced by more than half from 1.50 (indicating a 50% homicide rate increase) to 1.22 (indicating a 22% homicide rate increase) when percent female head of household, median household income, and unemployment rate were also taken into account. However, all three variables remained significant in the models when entered simultaneously, suggesting that they may capture related, but different aspects of social disadvantage (Table 3, model 1).

FIGURE 1. Homicide rate by percent African-American and percent female headship.

TABLE 3 Relative risk and (95% confidence intervals) describing the association of neighborhood characteristics with homicide (*n* = 3,867 CBGS)

Predictors	Predictors included simultaneously					
	Separate predictors	Model 1	Model 2	Model 3	Model 4	Model 5
Percent female-headed household (10% increments)	1.37 (1.33, 1.41)	1.17 (1.13, 1.21)	1.05 (1.01, 1.10)	1.18 (1.10, 1.26)	1.15 (1.11, 1.20)	1.07 (1.03, 1.11)
Median household income (\$10,000)	0.68 (0.65, 0.70)	0.85 (0.81, 0.89)	0.86 (0.82, 0.90)	0.85 (0.81, 0.89)	0.84 (0.80, 0.88)	0.87 (0.83, 0.91)
Percent not completed high school (10% increments)	1.50 (1.45, 1.56)	1.22 (1.17, 1.28)	1.24 (1.18, 1.30)	1.18 (1.12, 1.24)	1.23 (1.17, 1.29)	1.14 (1.09, 1.20)
Unemployment rate (10% increments)	1.50 (1.45, 1.56)	1.10 (1.03, 1.18)	1.07 (1.00, 1.14)	1.11 (1.04, 1.19)	1.10 (1.03, 1.18)	1.09 (1.02, 1.16)
Percent African-American (10% increments)	1.23 (1.20, 1.25)		1.13 (1.10, 1.15)			
Percent Hispanic (10% increments)	1.17 (1.13, 1.22)			1.07 (1.03, 1.12)		
Percent Asian (10% increments)	0.91 (0.86, 0.96)				0.91 (0.86, 0.95)	
Percent Caucasian (10% increments)	0.78 (0.76, 0.79)					0.86 (0.84, 0.88)

Separate predictors models. Estimates are for separate models where each predictor is put in individually (in addition to the background adjustment variables: year, spatial neighbor mean homicide, proportion of males aged 14 to 24 years of age, area in square miles, and a fixed effect for city)

CBGS: census block groups

The relationship between neighborhood racial/ethnic concentration and homicide was attenuated when unemployment rate, percent persons with less than high school education, median household income, and percent female head of household were simultaneously entered in the model. For example, the relative risk for percent African-American was reduced from 1.23 (Table 3, separate predictors model) to 1.13 (Table 3, model 2), indicating an attenuation effect of 43% $((0.23 - 0.13)/0.23)$. Similar results were also observed when neighborhood racial/ethnic concentration was measured by percent Hispanic and percent Caucasian (Table 3, models 3 and 5). Additional models examined how unemployment rate, percent persons with less than high school education, median household income, and percent female head of household individually attenuated the racial/ethnic concentration effects. Of the four indicators of social disadvantage, percent female head of household had the greatest effect attenuating the relationship between percent African-American and homicide; whereas the percent persons with less than a high school education had the greatest attenuation effect on the relationship between percent Hispanic and homicide (data not shown). In fact, the coefficient for percent Hispanic and homicide became nonsignificant when the percent persons with less than a high school education was the only covariate added to the homicide model. Interestingly, none of the four socioeconomic variables of interest mediated the effects of neighborhood racial/ethnic concentration on homicide for percent Asian.

Analysis of the homicide rates aggregated to the city level ($n=10$) found a positive but not statistically significant relationship between higher homicide rates and higher expenditure for law enforcement ($r=0.46$, $p=0.18$). Higher city level homicide rates were significantly and positively related to higher numbers of police per capita ($r=0.63$, $p=0.05$). When any other city-wide socioeconomic variables were included in the model, neither the expenditures nor numbers of law enforcement were statistically significant.

To examine potential city-specific differences in the associations between racial/ethnic concentration and homicide, neighborhood level analysis similar to that in Table 3 (models 2–5) was repeated for each city separately. Figures 2 and 3 show the log relative risk of homicide rate in each city and overall associated with a 10% higher percentage of African-Americans and Hispanics. The “unadjusted” results do not control for the social disadvantage covariates and only take into account background variables, time, spatial adjacency, proportion of males aged 14 to 24 years of age, and area in square miles; the “adjusted” results additionally take into account the social disadvantage variables, unemployment rate, percent persons with less than a high school education, median household income, and percent female head of household as well as the background adjustment variables. Figures 2 and 3 show that the relationship between neighborhood racial/ethnic concentration and homicide is explained more by social disadvantage variables in some cities than in others. For example, in Figure 2 considering Atlanta, the increased homicide rate found for a 10% increase in the percent African-American in a census block group is wiped out when social disadvantage covariates are also taken into account (as observed by the confidence interval for the adjusted results surrounding zero for Atlanta), implying that the racial/ethnic concentration effect on homicide in Atlanta can be fully explained by social disadvantage variables. In particular, for Atlanta, the percent persons with less than a high school education and median household income followed by the percent female headship were the strongest predictors of homicide and hence lead to percent African-American no longer being a significant predictor (data not shown). In Figure 2, this phenomenon is similar for Oakland and St. Paul where their adjusted confidence

FIGURE 2. Effects of having 10% higher percentage of African-Americans in a particular census block group on homicide mortality rate within each of the 10 cities and overall. The “unadjusted” results only take into account background variables, year, mean homicide of spatially adjacent neighborhoods, percent males aged 14 to 24 years of age, and area in square miles. Adjusted results also included covariates: percent persons with less than a high school education, percent female head of household, median household income, and unemployment rate as well as background variables. *Boxes* and *lines* represent log relative risk and 95% confidence intervals, respectively.

intervals for percent African-American cover 1 and thus are not significant. In Oakland, the percent persons with less than a high school education was the strongest predictor of homicide followed closely by median household income, but percent female headship dropped out in terms of significance. In St. Paul, median household income was the largest predictor of homicide while female headship and percent individuals with less than a high school were not significant (data not shown). On the other hand, there were several cities that still showed a significant racial/ethnic concentration effect even after adjustment consistent with the overall analysis (Table 3) that indicated a significantly positive racial/ethnic concentration effect for percent African-American and Hispanic after controlling for social disadvantage covariates.

FIGURE 3. Effects of having 10% higher percentage of Hispanics in a particular census block groups on homicide mortality rate within each of the 10 cities and overall. The “unadjusted” results only take into account background variables, year, mean homicide of spatially adjacent neighborhoods, percent males aged 14 to 24 years of age, and area in square miles. Adjusted results also included covariates: percent persons with less than high school education, percent female head of household, median household income, and unemployment rate as well as background variables. *Boxes* and *lines* represent log relative risk and 95% confidence intervals, respectively.

DISCUSSION

We tested the hypothesis that neighborhoods with higher concentrations of African-Americans and Hispanics would have higher homicide rates and that the association of racial/ethnic concentration with homicide would be attenuated after adjusting for neighborhood characteristics associated with social disadvantage. We found support for both hypotheses. Homicide rates were greater in neighborhoods with higher concentrations of African-Americans and Hispanics than in other groups, and the association of neighborhood racial/ethnic concentration with homicide was reduced after adjusting for our neighborhood social disadvantage variables. We also found that

the relationship between neighborhood racial/ethnic concentration and homicide was explained more by social disadvantage covariates in some cities than in others. Results provide additional support for sociological theories of crime such as social disorganization theory.

Social Disadvantage and Risk of Homicide

Much of the racial/ethnic homicide differentials in neighborhoods with high concentrations of African-Americans and Hispanics were explained by two of our four measures of social disadvantage, the percent female head of household and the percent persons with less than a high school education, respectively. This was not surprising given the positive correlations we observed between percent African-American and percent female headship (0.75) and between percent Hispanic and percent persons with less than a high school education (0.44).

African-Americans have higher rates of female head of households than other racial/ethnic groups, and some studies have shown that as the percentage of female head of household increases, so does crime.^{20,26,27} Social disorganization theory suggests that homicide rates are high in neighborhoods with large numbers of single-parent families because single-parent families have less time and resources to place sanctions on family behavior and maintain social order in their communities.^{6,7} Our finding that the relationship between neighborhood racial/ethnic concentration (i.e., percent African-American) and homicide is mediated by the percent female head of household is consistent with a similar finding reported by Parker and Rebhun.²⁰

Similarly, Hispanics have lower levels of educational attainment than other racial/ethnic groups,^{28–30} and some studies have found that crime rates are higher in neighborhoods with lower educational attainment.^{8,9,31} Education confers both cognitive (e.g., reasoning ability) and noncognitive skills (motivation, persistence, and self-esteem) that are important for future behavior.^{32,33} Homicide rates may be high in low education neighborhoods because youth living in these neighborhoods may have few employment prospects, hold low expectations about the future, and believe they have little to lose if they engage in violent crime. Our finding that neighborhood educational attainment mediates the relationship between racial/ethnic concentration (i.e., percent Hispanic) and homicide has not been previously reported to our knowledge.

Socioeconomic variables did not mediate the association of racial/ethnic concentration with homicide for percent Asian. The frequency of homicide in Asian neighborhoods was likely too low to adequately test this hypothesis in Asian neighborhoods. In 2004, the homicide rate for Asian men 15 to 34 years of age was 3.6 per 100,000 compared to 45.5 per 100,000 for African-American men of the same age.¹

The relationship between neighborhood racial/ethnic concentration and homicide was explained more by socioeconomic variables in some cities than in others. For example, in Atlanta, the percent persons with less than a high school education, median household income followed by percent female headship were the strongest predictors of homicide and lead to percent African-American no longer being a significant predictor. Results from our study underscore the importance of conducting multiple and city-specific analyses simultaneously when analyzing racial/ethnic homicide differentials.

Limitations

Our results are limited in their generalizability to neighborhoods in cities with under one million persons. Future studies may wish to include larger cities, such as Chicago or New York. In addition, we did not include variables measuring gang violence, which has also been found to be related to homicide.^{34,35} In our study, we used city as a

proxy measure to contextual differences across cities such as gang and drug market activity. Future studies may wish to control for gang violence when possible. Finally, data on neighborhood socioeconomic characteristic were cross-sectional and based on the 2000 Census. Some of the neighborhoods may have changed between the census measure and an individual homicide. We do not believe that the latter represents a significant bias in our study because it generally takes several years for the socioeconomic characteristics of neighborhoods to change significantly.³⁶

Implications

Public policy can be an effective tool to change the social and economic conditions that contribute to high homicide rates in African-American and Hispanic neighborhoods. Based on our findings, policy makers may wish to consider implementation of policies that (1) expand early childhood education programs and higher education opportunities, especially among less affluent Hispanic households, and (2) encourage economic and community development initiatives, particularly in neighborhoods with high rates of African-American single-parent families. Increasing funding for more police on the streets alone may not be effective in reducing homicide victimization rates in inner cities based on our findings.

Early childhood education programs provide important skills that can lead to future success.^{37,38} Heckman and colleagues³³ suggest early childhood education programs like Head Start work, not because they boost IQ, but because they raise noncognitive skills that promote success in social and economic life. Increasing public investment in early childhood education programs and higher education may be beneficial for everyone. Galea and Ahern,⁸ in their ecological analysis of New York neighborhoods, argue that even a small number of educated individuals in a neighborhood can improve the quality of community life for all residents.

Results from an evaluation of the Empowerment Zone and Enterprise Community (EZ/EC) initiative highlight the potential of economic and community development initiatives to change conditions in socially disadvantaged neighborhoods.³⁹ The EZ/EC program is one of the most recent in a series of large-scale federal efforts (one billion in program grant funds) to revitalize impoverished urban and rural areas in the U.S. via grants, business loans, and tax incentives. Researchers evaluating the EZ/EC program found that, in the aggregate, neighborhoods designated as EZs or ECs showed improvements in poverty, unemployment, and economic growth.³⁹ Results of the EZ/EC initiative suggest that initiatives that focus on a broad range of economic and community development activities may be especially beneficial (e.g., job training and creation, quality child care, neighborhood recreational facilities, etc.).

Implementation of public policies such as those we have described will require broad public support. Community organizing can be an important vehicle for building public support and adopting public policies that meet local needs. Community organizing is a long-term approach where people affected by an issue are supported in identifying problems and taking collective action to achieve solutions.⁴⁰ At the heart of community organizing are inclusion, ownership, relationship building, and leadership development—all of which are critical to developing effective local policies to reduce violent crime.

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