Segregation and Violence Reconsidered: Do Whites Benefit from Residential Segregation?

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Abstract

Segregation plays a central role in perpetuating and maintaining racial inequality, yet little research has examined the impact of the long-term changes in segregation on inequality, such as racial differences in violent crime. This is a significant omission given the marked declines in black-white segregation since 1970. Moreover, there is a lack of consensus on whether segregation is beneficial to white Americans, despite unanimity in the literature that it is detrimental to African Americans. This paper seeks to fill this gap by using US Census and CDC mortality data for 103 major metropolitan areas from 1970-2010 to determine whether residential segregation impacts race-specific homicide rates in metropolitan areas. We find that segregation plays a salient role in exacerbating racial differences in violence by increasing homicide victimization among African Americans while simultaneously decreasing homicide among whites.

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Although the ghetto remains a basic feature of many American communities (Logan 2013), the United States has experienced marked declines in black-white segregation over the past 40 years. Between 1970 and 2010, the United States went from the apex of 'American Apartheid' (Massey and Denton 1993) to what some scholars have called the "end of the segregated century" (Vigdor and Glaeser 2012). Yet, while a substantial amount of research has investigated the causes of the decline in segregation (Iceland 2009; Vigdor 2013; Krysan and Crowder 2017), the "literature says surprisingly little about the *consequences* of observed increases in black-white residential integration" (LaFree, Baumer, and O'Brien 2010: 93 [emphasis added]). Addressing this blind spot is important given that segregation is seen as both a fundamental determinant of racial inequality (Massey and Denton 1993) and the "linchpin" connecting broader patterns of racial stratification to racial disparities in violent crime (Peterson and Krivo 2010).

Within the segregation-violence literature, however, there is considerable debate about the consequences of segregation for different racial groups. While the evidence overwhelmingly suggests that segregation harms African Americans by concentrating social ills that disproportionately affect urban blacks (e.g. poverty, unemployment), there is less consensus about the effects of segregation for whites.[1] According to Krivo and colleagues (2009), because segregation forces social issues to cleave along racial lines, whites and blacks have little common interest in forming coalitions necessary to combat the structural problems that foster crime. As a result, the criminogenic consequences of segregation become everyone's problem, increasing violence for black and white neighborhoods alike. From this perspective, residential segregation persists to the detriment of both blacks and whites.

However, an alternative view suggests that segregation has divergent criminogenic consequences for whites and blacks. According to Massey (2001), segregation promotes high levels of violence among blacks by geographically concentrating poverty while simultaneously shielding whites from violent crime and other social problems, thus creating an incentive for whites to perpetuate the ghetto in U.S. society. In his words, "racial segregation persists in the United States because whites benefit from it" (Massey 2001: 338). Adjudicating between these

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[1] Unless stated otherwise, we follow contemporary usage and use the term white to refer to non-Hispanic whites, and black to refer to non-Hispanic blacks.

perspectives is critical as they engage core sociological questions as to why black-white segregation remains stubbornly and persistently at levels well above those observed for other racial/ethnic groups (Logan 2013).

Against this backdrop, we revisit the question as to whether whites benefit from segregation, utilizing the case of violent crime. The focus on violence is warranted as it remains one of the most manifest racial inequalities in the United States and homicide is one of the principal contributing factors to black-white differences in mortality (Fuchs 2016). Using race-specific information on homicide, socioeconomic, and demographic characteristics for 103 major metropolitan areas, we examine whether the changes in segregation between 1970 and 2010 influenced the prevalence of homicide for both whites and blacks. In doing so, we address four conceptual and empirical issues that have hampered prior research in this area.

The first concerns the geographic scope of the segregation-violence nexus. Most prior research uses data from central cities to examine the links between segregation and crime (Peterson and Krivo 1999, 2010; Peterson, Krivo, and Kuhl 2009; LaFree et al. 2010; Shihadeh and Flynn 1996; Parker and Stansfield 2015).[2] Consequently, the role of suburbs has been undervalued in previous research. This is a significant oversight for several interrelated reasons. Most notably, decades of white flight from central cities contributed significantly to increased suburbanization and segregation (Boustan 2010; Massey and Denton 1993). As a result, the divide between the suburbs and the urban core remains a defining component of segregation (Farrell 2008) and racial-spatial inequality generally (Rothstein 2017). Moreover, there are stark differences in the demographic composition of cities and suburbs that warrant consideration. In 1990 (the midpoint of our study), a supermajority of whites (74 percent) in metropolitan areas were located in the suburbs, compared to just 34 percent of blacks (Frey 2011). Thus, if "we must recognize that the impact of race and residence on social outcomes is conditioned by where populations actually reside" (Krivo et al. 2009: 1774), then an assessment of the consequences of segregation for whites must look beyond the central city. We address this concern by using the

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[2] The National Neighborhood Crime Study (NNCS) utilized by Peterson et al. (2009) does include a small number of large suburban cities (16), but their analyses are limited to the effects of segregation *within* these cities as opposed to the segregation patterns caused by the interrelationship *between* cities and suburbs. To provide an example, in their analysis the patterns of racial sorting within Naperville, Illinois are treated as independent of the racial sorting within Chicago, Illinois. Research on segregation patterns generally (Iceland 2009), and in Chicago specifically (Sampson 2012), suggest this is an empirically untenable assumption.

metropolitan statistical area (MSA) as our unit of analysis, which not only includes large cities but captures the surrounding suburban municipalities as well.

The second relates to the relative paucity of longitudinal segregation-crime research. Because most prior studies use cross-sectional data (Peterson and Krivo 1999, 2010; Peterson, Krivo, and Kuhl 2009; Shihadeh and Flynn 1996; Bjerk 2006), we know comparatively little about whether the changes in segregation since 1970 are related to changes in violence for whites and blacks. Given the scale of decline in segregation over the last 40 years, where the level of black segregation is lower today than at any point in the past century (Vigdor 2013), this is a notable omission, especially in light of substantial declines in racial disparities in violence over this period (Lafree et al. 2010; Light and Ulmer 2016). If racial segregation is indeed driving black-white differences in crime, declines in the black-white violence gap are an expected outcome of integration. The research thus far, however, has been mixed on this point. Light and Ulmer (2016) document lesser black-white homicide gaps from decreased segregation, while Lafree and colleagues (2010) show no effect of integration on black-white disparities in homicide. Using data from 1970 to 2010, we address the dearth of longitudinal segregation-violence studies with an eye towards disentangling the conflicting findings in extant research.

Third, research on racial differences in violent crime, including those investigating the link between segregation and race-specific rates of violence (Parker and Stansfield 2015; LaFree et al. 2010), has largely failed to account for the growing ethnic diversity of U.S. society (Steffensmeier et al. 2011). Since 1970, the Hispanic population has increased over five-fold, from 9.6 million (representing 4.7% of the total population) to nearly 51 million by 2010 (comprising 16.4% of the U.S. population) (Pew Research Center 2017). This increasing diversity has redefined the racial/ethnic composition of metropolitan America, as Hispanics now outnumber blacks as the largest minority group in major metropolitan areas (Frey 2011). Because ethnic identifiers are rarely collected in official crime statistics, the growth in the Hispanic population obscures our understanding of race-specific crime rates. This is especially the case for whites because crime-reporting programs often report Hispanic arrestees as "white" and Hispanics' level of violence tends to fall in between the rates for whites and blacks (Steffensmeier et al. 2010). As a result, the "white" rate of homicide from official crime statistics is often artificially inflated, leading to inaccurate estimates of the white non-Hispanic rate of crime and the true black-white disparities in violence. In 2010 for example, the "white" homicide

rate in major metropolitan areas was 52 percent higher than the white non-Hispanic rate. In Chicago, the white non-Hispanic homicide rate was only half the "white" rate. In Los Angeles, it was less than 35 percent the "white" rate.[3] In short, any examination of race-disaggregated crime data must disentangle Hispanics from non-Hispanic whites. Mindful of this concern, we leverage geocoded mortality data from the Centers for Disease Control (CDC), which collect both race and ethnic identifiers, to calculate separately white non-Hispanic and black non-Hispanic rates of homicide. Therefore, our analysis provides the first longitudinal assessment of the link between segregation and white violence that is not contaminated by ethnic involvement in crime.

The fourth issue concerns the challenges to causal inference in the segregation-crime relationship. While previous research posits that segregation increase violent crime, there is growing recognition that this relationship is likely reciprocal, with increasing crime resulting in higher levels of segregation (Liska, Logan, and Bellair 1998). Cullen and Levitt (1999), for example, found that white flight into the suburbs is partially a response to high crime rates in the inner city. Drawing from the seminal work of Cutler and Glaeser (1997), we employ an instrumental variable analysis to account for this potential endogeneity. Analytically, we use the number of municipal and township governments in 1962 as an instrument to isolate exogenous variation in segregation, thus breaking the simultaneity between segregation and crime and identifying the causal effect of segregation on white homicide.

In the following sections we explicate the conflicting theoretical perspectives on the consequences of segregation for whites. From there, we discuss our data, analytical strategy, and results. We conclude with a discussion of our findings within the context of both historical and contemporary patterns of racial segregation.

Segregation, Racial Structure, and Violent Crime

Extant research identifies both direct and indirect pathways through which segregation increases violence. Within this body of work, the indirect impacts feature most prominently. Drawing from Wilson's (1987) research on social isolation and Massey and Denton's (1993) discussion of concentration effects, the core of this thesis is that segregation increases violent crime by concentrating structural disadvantage (Peterson and Krivo 1999). That is, segregation

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[3] Authors' calculation of CDC Underlying Cause of Death files at the MSA level.

combined with the unequal distribution of social and economic resources across racial groups guarantees the concentration of poverty and its attendant consequences (e.g. joblessness, family disruption, low education) within the black community (Massey 1990). As a result, racial segregation creates an ecological niche for blacks that inhibits employment networks (Wilson 1987), decreases school quality (Massey, Condran, and Denton 1987), reduces public investment (Massey and Denton 1993), erodes local systems of social control and collective efficacy (Sampson and Wilson 1995), foments legal cynicism (Kirk and Papachristos 2011), and encourages gang formation and subcultural adaptations that value the strategic use of violence (Massey 2001; Anderson 1999). Thus, by concentrating criminogenic structural factors in black (but not white) neighborhoods, prior research implicates segregation as playing a key if not defining role in explaining the comparatively high rate of violence within the black community (Sampson and Wilson 1995; Shihadeh and Flynn 1996; Peterson and Krivo 1993; 2005). By implication, this might also suggest that whites derive benefits from segregation by sequestering themselves away from endemic poverty and crime and into more advantaged community contexts. However, recent research identifies a broader and more direct set of segregation-induced consequences that suggest this may not be the case.

According to Krivo and colleagues (2009), the deleterious consequences of segregation are not limited to minority communities, but extend to white communities as well. This is because segregation does not just concentrate disadvantage; it also undermines the community organization necessary to control crime. In this regard, their perspective adjoins classic sociological arguments on the criminogenic consequences of social disorganization (Shaw and McKay 1942; Sampson and Groves 1989). In integrated communities, different racial and ethnic groups collectively benefit from working together to garner political, economic, and social resources. By maintaining the spatial separation of unequal racial groups, however, segregation disincentivizes the formation of partnerships to solve problems and limits common interests across racial groups. "The result is a racially and spatially divided public and political organization where both the motivation and the coalitions necessary to implement strategies to improve social and institutional structures that affect crime are lacking in resource-strained urban environments" (Krivo et al. 2009: 1771). Thus, despite whites' efforts to avoid the social costs of concentrated poverty by residing in predominantly white neighborhoods, segregation nonetheless creates conditions conducive to higher rates of violence throughout the city, including white

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areas. In support of their argument, Krivo et al. (2009) used cross-sectional data from the National Neighborhood Crime Study (NNCS) and found that violent crime is higher in neighborhoods within segregated cities, regardless of the racial/ethnic composition and the level of disadvantage. Thus, even in comparatively privileged white neighborhoods, the broader context of citywide segregation results in higher levels of violence (see also Peterson and Krivo 2010). This perspective generates a clear directional hypothesis on the segregation-violence link: *increased segregation should be associated greater white homicide rates*.

Yet, despite the unique contributions of their study, two consequential limitations obstruct our understanding of the racial consequences of segregation. First, the focus on overall rates of violence tells us little about the impact of segregation on *race-specific* rates (Sampson 1985). For instance, it is plausible that any resultant increase in black violence from segregation may spill over into other neighborhoods throughout the city. In this scenario, segregation may increase violent crime across different communities while only affecting the black rate of violence. Therefore, to understand the criminogenic costs of segregation for different racial groups, race-specific rates are essential.

Perhaps even more consequential, however, is the emphasis on segregation at the *city-level*. As we detail in the following section, the focus on within-city dynamics neglects the broader demographic context of segregation that likely conditions the segregation-violence relationship for whites.

White Flight, Suburbanization, and Heterogeneous Effects

According to Krivo et al. (2009), whites' attempts to seclude themselves in segregated neighborhoods within cities has been unsuccessful at shielding them from the criminogenic consequences of segregation. However, the empirical and historical reality is that most whites did not segregate themselves within central cities, but left the cities entirely. Between 1940 and 1980, the share of white metropolitan households living in central cities fell from 64 to 32 percent. During this period, the 1968 Kerner Commission Report offered a critical assessment of U.S. race relations: 'Our nation is moving toward two societies, one black, one white—separate and unequal' (National Advisory Commission on Civil Disorders 1968:1). Chief among their concerns, as well as those of the 1970 Eisenhower Commission Report, was the violence in deteriorating urban ghettos and the spatial differentiation between urban blacks and suburban

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whites. According to the Eisenhower Report, "suburban neighborhoods, geographically far removed from the central city, will be protected mainly by economic homogeneity and by distance from population groups with the highest propensities to commit crimes (Eisenhower Report 1970: 40).

Important for this research context, numerous studies demonstrate violent crime played a salient role in stimulating white out-migration from central cities. Liska and Bellair (1995), for example, used city-panel data from 1950 to 1990 and found that violent crime (particularly robbery) substantially influenced white flight from central cities (see also Liska, Logan and Bellair 1998; Krysan, Carter, and van Londen 2016; Taub, Taylor and Dunham 1984). Along similar lines, Morenoff and Sampson (1997) found that increases in neighborhood homicide and proximity to homicide were associated with white population loss in Chicago, one of the most segregated metro areas in the United States (Sampson 2012). In addition, it is important to note that most (~80 percent) of those who left central cities in response to crime tended to remain in the same metropolitan area (Cullen and Levitt 1999). Thus, it appears that whites attempted to avoid African Americans and urban crime not be isolating themselves in segregated neighborhoods, but by retreating into the less dangerous surrounding suburbs (Boustan 2010).[4]

Blacks, however, due to both individual and institutional discrimination, were largely excluded from postwar suburbanization (Rothstein 2017; Massey and Denton 1993). Consequently, between 1940 and 1980, the share of metropolitan blacks living in central cities decreased only slightly, from 80 to 72 percent (Boustan and Margo 2013). This spatial differentiation between blacks and whites led to the familiar pattern of what Farley et al. (1978: 197) famously described as "chocolate cities and vanilla suburbs." Despite the passage of the Fair Housing Act of 1968, this suburban-city divide permeates the racial landscape to this day; as the overwhelming majority of white Americans live in suburbs and suburbs remain predominantly white. Subsequently, despite recent trends towards increasing suburban diversity, suburban whites continue to live in a social world where the vast majority of residents are also

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[4] In 1990, the violent crime rate in central cities was nearly 3 times the suburban violent crime rate. The homicide rate was over 7 times higher. Even after the dramatic reduction in violent crime during the 1990s and 2000s, which mostly occurred within inner city neighborhoods, substantial disparities remain. In 2008, the violent crime rate in cities was double the suburban rate, and the homicide rate was four times higher (Kneebone and Raphael 2011).

white. In contrast, in 2010 only 40 percent of African Americans lived in suburbs (Massey and Tannen 2017).

The consequence of such a highly racialized process of suburbanization is that the racial-spatial divide since 1970 has been maintained less by neighborhood boundaries *within* municipalities, but by racial sorting *across* municipal boundaries. As Farrell (2008: 467) notes, "[u]rban and suburban municipalities are replacing neighborhoods as the central organizing units of metro segregation." In fact, Lichter and colleagues (2014) demonstrate that while black-white neighborhood segregation within municipalities decreased between 1990 and 2010, these gains were substantially offset by increased segregation between municipalities. Thus, they suggest that the U.S. may be moving towards a new macro-segregation, as between-municipal sorting now accounts for roughly half of the all black-white segregation in the most segregated metropolitan areas of the United States.

Taken together, if suburbanization was spurred by white flight from central cities, the overwhelming majority of whites live in suburbs, and suburbanization plays a significant role in maintaining segregation, then any inquiry into the criminogenic consequences of segregation for whites must broaden the analytical lens to the entire metropolitan area. Doing so has significant implications for who suffers the consequences of concentrated crime and poverty, as Massey (2001: 337) explains:

> Although neighborhood-level segregation may confine blacks and their social problems to certain residential areas, if whites and blacks still live in the same municipality, whites still have to shoulder the costs of black poverty. If, however, blacks are segregated *across municipal* as well as neighborhood boundaries, not only can whites minimize their exposure to crime and other social problems but also, to a large extent, they can avoid paying the costs as well [emphasis in original].

Thus, in direct contrast to Krivo et al. (2009), this perspective suggests that whites benefit from segregation in terms of lesser violence, begetting an equally clear yet conflicting directional hypothesis: *increased segregation will be associated with lower levels of white homicide.*

Data

We compiled multiple data sources across five decades (1970-2010) to test the competing theoretical hypotheses outlined above. This extended time frame is auspicious for our research

question, as 1970 represents a turning point in the history of racial segregation. Following decades of increasing spatial separation of blacks and whites, the zenith of black-white segregation in the United States came in 1970 (Massey and Denton 1993; Cutler, Glaeser, and Vigdor 1999). This was also the first time in U.S. history that more of the U.S. population lived in suburbs than central cities (Berry and Dahman 1977). Following the passage of the 1968 Fair Housing Act, however, black-white segregation decreased in each successive decade, dipping to levels not observed since 1910 (Vigdor and Glaeser 2012). Thus, our study period captures this important demographic shift as well as a significant amount of variation to examine the impact of segregation on homicide.

Our homicide measures come from restricted geocoded mortality data provided by the CDC Underlying Cause of Deaths files for 1969-2011, which includes all death records in the United States.[5] Compared to traditional crime statistics (e.g. the Uniform Crime Reports), the use of death records has several distinct advantages. The vital statistics represent one of the only nationally representative data sources on homicide that records information on both race and ethnicity. Given our concerns regarding the conflation of Hispanic with white homicide rates, particularly in the latter part of our study period, this is a paramount consideration. Related to this point, research has shown that the racial and ethnic indicators on death certificates evidence a high degree of reliability with little indication of serious misclassification problems (Arias et al., 2008; Riedel 1999). Moreover, research suggest that the CDC death records are more reliable and comprehensive that the UCR homicide reports (Loftin et al. 2008), and unlike official crime statistics, coroner reports are not subject to discretionary decisions made by law enforcement personnel (O'Brien 1996).

We limit our analysis to metropolitan areas that had a minimum of 5,000 blacks and whites in each decade to obtain reliable estimates of the homicide rate for both racial groups.[6] Homicide deaths for whites and black were aggregated using the Office of Management and

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[5] We use the location of occurrence rather than the location of residence so that the metropolitan characteristics accurately reflect the risk of homicide victimization. The homicide data were provided to the first author under special contract by the National Center for Health Statistics.

[6] The results are substantively unchanged when we use population cutoffs of 7,500 and 10,000 (available on request).

Budget 2008 metropolitan area definitions for all years to ensure comparability of the results over time.

We leverage information from the Neighborhood Change Database (GeoLytics 2010) to calculate our segregation measures, which normalizes census tract data across all five decades (1970-2010) to establish uniformity of our MSAs over time. Race-specific demographic and socioeconomic controls come from US Census data through the University of Minnesota's Integrated Public Use Microdata Series (IPUMS) (Ruggles et al. 2017).[7] Lastly, we account for changes in incarceration using data from the Bureau of Justice Statistics and police presence using police employee data provided by the FBI Uniform Crime Reports.

The final analytical sample consists of 103 metropolitan areas (yielding 515 period-specific observations) that are highly representative of our target populations; on average, accounting for 86 percent of all metropolitan blacks (and 89 percent of black homicides) and 77 percent of all metropolitan whites in each decade (inclusive of 76 percent of white metropolitan homicides). Therefore, our sample provides an opportunity to examine the segregation-violence link across a broad range of metro areas with distinct histories of race relations and make generalizable conclusions about the longitudinal relationship between segregation and homicide for blacks and whites.

Dependent Measures

Table 1 reports the descriptive statistics and operationalization for all variables in the analysis. We utilize two dependent variables, the *white non-Hispanic homicide rate* and the *black non-Hispanic homicide rate*. For both groups, we first calculated the average number of homicides across the following years: 1969-1971, 1979-1981, 1989-1991, 1999-2001, and 2009-2011. The use of three-year averages reduces the influence of annual variations in homicide counts. We then express the rates as per 100,000 in each respective population (e.g. the number of non-Hispanic white homicides divided by the total number of white non-Hispanics in each MSA, per 100,000). It is important to note that the CDC death records did not begin collecting

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[7] The data for 1970 come from the 1% Form 1 and 2 Metro sample from the 1970 US Census. For 1980, 1990, and 2000, we use the 5% Public Use Microdata Sample in each respective year. The data for 2010 came from the 2010 American Community Survey sample. The use of the PUMS and ACS data is necessitated by the fact that not all measures used in this analysis are available in the pre-tabulated Census files.

information on ethnicity until 1989. Thus, for 1970 and 1980, we calculated a Hispanic adjustment factor to tease out the number of Hispanic homicides in the "white" and "black" counts. This correction involves three steps. First, for each MSA we calculated separately the percent of "white" and "black" homicides that were actually white Hispanics and black Hispanics in 1990, 2000, and 2010. We then took the average of these proportions and multiplied it by the number of "white" and "black" homicides in 1980.[8] This number represents the estimated number of Hispanic white and Hispanic black homicides in each MSA. The final step involved subtracting the estimated number of Hispanics from the "white" and black" homicide counts prior to calculating the rates. We provide a worked-through example of our adjustment procedure in the appendix.

(Table 1 about here)

We ran a series of validity of checks to ensure the legitimacy of our adjustment. Because Hispanics tend to be recorded as white in homicide files,[9] the degree of bias from not correcting for Hispanics should be far greater for whites (compared to blacks) and should become more severe over time, as the population of Hispanics has increased substantially over our study period. Thus, due to the comparatively small Hispanic population in 1970, there should be a high correspondence between "white" and non-Hispanic white homicide rates across MSAs, that should consistently decrease with the growth in the Hispanic population.[10] For blacks, however, because few Hispanic homicides are recorded as "black," the correlations between "black" and non-Hispanic black homicide rates should be relatively consistent over time. Both of these patterns are evident in our data. The correlation between the "white" and the white non-Hispanic homicide rates goes from .93 in 1970, to .94 in 1980, .81 in 1990, .73 in 2000, to .69 in 2010. For blacks, on the other hand, we see virtually no change in the correspondence between "black" and non-Hispanic black homicide rates, with correlations above .99 in each decade.

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[8] For the adjustment in 1970, we use the calculated percentages in 1980-2000 so that both correction factors are based on the subsequent three decades.

[9] Between 1990 and 2010, a full 96.7 percent of metropolitan Hispanic homicide victims had their race recorded as white. Only 2.6 percent were recorded as black.

[10] It is important to note that the denominator changes when calculating the "white" and white non-Hispanic homicide rates to match the corresponding population in the numerator (e.g., the "white" homicide rate includes white Hispanics in both the numerator and denominator). This is also true of the black rates.

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A second validity check involved comparing the adjusted homicide counts for 1990 with the actual number of homicides in that year to evaluate the accuracy of our adjustment. In this test, we use the values in 2000 and 2010 to adjust the "white" and "black" counts in 1990 following the same procedure outlined above. For 1990, the adjusted white non-Hispanic homicide count is correlated with the observed number of white non-Hispanic homicides at .98. For non-Hispanic black homicides, the correlation is .99.

We also undertook two alternative adjustment procedures that impute Hispanic homicide rates based on the size of Hispanic population in each decade. We detail these alternative procedures in the appendix and report substantively similar results using these different methodologies (see Appendix Table 1). Finally, and most importantly, we replicate our core findings using only data from 1990-2010 to ensure that the results are not dependent on any assumptions in the 1970 and 1980 data. These results are reported in model 4 of Appendix Table 1.

Independent Measures

Our focal independent measure is the black-white index of dissimilarity (*D*). This measure captures the unequal distribution of whites and blacks within a given metropolitan area. The index ranges from 0 (complete integration) to 100 (complete segregation) and indicates the percentage of blacks that would have to move to achieve an even spatial distribution with whites in tracts across the metropolitan area. The dissimilarity index is the most widely used measure of segregation in both sociology and criminology, including the work to which this study most directly engages (Krivo et al. 2009; Massey 2001; Light and Ulmer 2016; Lafree et al. 2010). As such, it is useful for comparing the results of our analysis with previous research in this area.

To isolate the effects of segregation and examine the extent to which segregation influences homicide beyond the concentration of disadvantage, we include a host of theoretically informed *race-specific* measures. In line with previous research, we capture the entanglement of poverty and other social problems by creating an index of *structural disadvantage*, which is characterized by high factor loadings for the percentage of the population in poverty, the proportion of children born to unwed mothers, and the unemployment rate. While the segregation-crime literature has tended to focus on the role of concentrated disadvantage, our analysis captures a second potentially important consequences of segregation: *concentrated affluence*. Racial wealth inequalities have widened substantially in recent decades (Kochhar, Fry

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and Taylor 2011), along with increasing residential segregation by income (Reardon and Bischoff 2014). The result is a substantial number of "racially concentrated areas of affluence" characterized by exclusionary enclaves of white wealth (Goetz et al. 2017; Massey 1996). This type of racial-economic sorting may be consequential for understanding the racial differences in the likelihood of criminal victimization. Just as the concentration of disadvantage may encourage violence by heightening social disorganization, areas of concentrated affluence may provide protective mechanisms from violence such as greater political and collective efficacy, the resources to stabilize institutions that regulate behavior (e.g. schools, churches, local businesses), and greater ability to garner law enforcement resources (Velez et al. 2003). Thus, to capture this alternative side of the segregation dynamic, we include a measure for the proportion of household incomes that are 500% above the poverty line.

Research identifies deindustrialized and the loss of inner-city manufacturing jobs since 1970 as a key factor in explaining racial inequality (Wilson 1987, 1996). We capture this macroeconomic shift by measuring the percentage of workers employed in manufacturing industries. We also include four important measures of demographic composition. Prior research indicates that both violent crime and patterns of segregation are influenced by the relative size of the black population (Peterson and Krivo 2010; Logan, Stults, and Farley 2004). Thus, we include a measure for the proportion black in each MSA. We measure the amount of residential instability within metro-areas by including the percentage of individuals who moved in the past two years. Because most violent crimes are committed by young men (Cohen and Land 1987), we account for differences in size of the crime prone population by including the proportion of the population in each MSA that is between 15 and 24 and male. The last demographic variable captures the substantial influx of immigrants over our study period, measured as the percentage foreign-born for each racial group. Finally, we include two salient criminal justice measures, incarceration and police presence. Between 1970 and 2010, the U.S. incarceration rate quintupled (Wagner 2014), reaching both historically and internationally unprecedented levels of mass incarceration. Over roughly this same period, police presence in also increased considerably (Donohue and Ludwig 2007). Both of these developments are important for our inquiry given that research suggests that increased incarceration rates and greater police presence are both associated with less violent crime (Levitt 1996; Chalfin and McCrary 2018). To capture

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both of these significant criminal justice shifts, we include measures for the state incarceration rate[11] and the number of police officers per capita (not race-specific).

Analytical Strategy

A principal strength of our inquiry is the ability to move beyond cross-sectional analyses. We leverage the longitudinal nature of our dataset by including *MSA* and *year fixed effects* in our regression models. We preference fixed over random effects based on direct analytical comparisons using the Hausman test that demonstrate the coefficient vector in our data is inconsistent using random effects (Hausman 1978). By treating each MSA as its own control, our models remove the effects of all time-invariant causes of homicide that potentially confound the segregation-violence relationship, regardless if they are measured (Firebaugh 2008). Moreover, our focus on within MSA change eliminates the effects of variation in reporting and data collection methods across MSAs. Equally important, the inclusion of year effects adjusts the model parameters for any unmeasured trends that influenced homicide rates nationally. We report heteroscedasticity-robust standard errors and all models are weighted by the size of the respective racial group in each decade (e.g. the white model includes population weights for the size of the white population) so that the parameter estimates reflect the typical relationship between segregation and homicide rates experienced by the average white or black resident.

Results

Descriptive Results

We begin by first considering the bivariate association between segregation and homicide since 1970. Figure 1 displays the population weighted homicide rates for whites and blacks across the distribution of black-white segregation. Here the distribution is shown across four quartiles, ranging from the least segregated (1st quartile) to the most segregated MSAs (4th quartile). Three notable patterns are evident. First, the black-white homicide gap is greatest in more segregated metro areas and this appears to be due to the divergent association between

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[11] Using state-level incarceration data is appropriate because although most violent crime occurs within urban communities, most offenders are incarcerated in prisons located outside metropolitan regions (Huling 2002). State-level race-specific incarceration data is not available until 1978 in the National Prisoner Statistics. However, our central findings are unchanged when we include race-specific incarceration rates (i.e. the black incarceration rate and the white incarceration rate) and limit the analysis to 1980-2010.

segregation and black compared to white homicide rates. In line with prior research, the rate of black homicide is considerably higher in more segregated metro areas, increasing monotonically across each quartile. Compared to the least segregated areas (black homicide rate 20.1 per 100,000), African Americans living in the most segregated MSAs were more than twice as likely to be a victim of homicide (41.0 per 100,000) between 1970 and 2010. Moreover, the black homicide rate is significantly different across each quartile based on t-tests. For whites, however, a very different pattern emerges. The white homicide rate remains stable across different levels of segregation, hovering around 4 per 100,000. Indeed, t-tests reveal that none of the white homicide rates are significantly different across the distribution of segregation.

(Figure 1 about here)

Overall, the results in Figure 1 suggest that despite the fact that the most segregated metro areas are also some of the most dangerous ones (e.g. Baltimore, Chicago, Detroit, Flint, St. Louis, Gary), whites appear relatively immune from increased homicide in black communities. In line with the theorizing of Massey (2001), one plausible explanation for this finding is that the spatial separation of whites from blacks creates the conditions for increased black homicide while simultaneously inoculating most whites from the violence within inner cities. However, this pattern could also be driven by other social or economic changes over this period, and thus we turn to our multivariate results to more rigorously scrutinize this hypothesis.

Black Homicide

Table 2 presents population-weighted regression models examining the association between segregation and rates of black homicide. In addition to the non-race-specific variables, MSA, and year fixed effects, model 1 includes all black-specific measures. Model 2 then includes all white-specific measures. Across both models, the focal results comport entirely with prior research and align with the bivariate findings: net of MSA and period fixed effects, there is a statistically significant positive relationship between increased black-white segregation and black homicide rates, and the effect size suggests the homicide increases are considerable. Interpreted substantively, the results in model 2 suggest that a 10 percent increase black-white dissimilarity results in nearly 6 additional black homicides (per 100,000). The substantive import of segregation in explaining black homicide is also evident in the standardized coefficients. According to model 2, a standard deviation increase in segregation is associated with a .42 standard deviation increase in black homicide, a sizeable effect when compared with the other

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measures in the model. And it is important to note that the segregation effects are net of multiple measures of disadvantage, suggesting that segregation has broader criminogenic consequences than just concentrating poverty and related social problems. Whether this broader effect includes consequences for white homicide is examined in Table 3.

(Table 2 about here)

White Homicide

Table 3 presents population-weighted fixed effects models of white homicide victimization. Like the results for black homicide, we report two models. Across both, the segregation results are statistically indistinguishable and, critical to our inquiry, in the completely opposite direction of the black homicide findings. For whites, increased segregation is associated with statistically significant *decreases* in homicide victimization, net of measured covariates, MSA, and year effects. The conflicting consequences of segregation for whites and blacks are shown graphically in Figure 2. Based on the results in Tables 2 and 3, we show the predicted homicide rates for whites and blacks across the distribution of segregation, holding all variables constant at their means. There are three noteworthy patterns.

(Table 3 about here)

(Figure 2 about here)

First, black-white segregation has pronounced criminogenic consequences for the black community. Based on our results, the predicted black homicide rate in the most segregated MSAs is over 4 times greater than in the least segregated MSAs, even after adjusting for a host of theoretically informed measures and all time-invariant and national effects. Second, Figure 2 provides a dramatic picture of how segregation exacerbates black-white homicide inequality. In the most segregated areas, the gap between black and white homicide rates is 44.1 (per 100,000). In the least segregated MSAs, the black-white homicide gap is only 4.9 (per 100,000). By implication, the results in Figure 2 suggest that reductions in segregation since 1970 have played an important role in explaining the decreasing gaps in black-white homicide over the last few decades. Lastly, Figure 2 vividly illustrates the distinct impact of segregation for whites compared to blacks. The white homicide rate in the most segregated MSAs (2.8 per 100,000) is less than half the white homicide in the least segregated MSAs (5.9 per 100,000), net of other relevant factors. In reference to our competing hypotheses, the results run counter to the theoretical process detailed by Krivo and colleagues (2009) that predicted increased violent

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crime for both whites and blacks in more segregated areas. Rather, the weight of the evidence presented in Figure 2 aligns more with Massey's (2001) argument on the duality of segregation's consequences, where African Americans bear the brunt of deteriorating and violent neighborhoods while whites benefit from spatially concentrating social problems away in minority areas. That said, given the conflicting theoretical predictions on the segregation-white homicide nexus, and because this empirical relationship represents our principal innovation, it is important to consider the robustness of this finding.

Accounting for Hispanics

While we were careful to account for Hispanics in the homicide counts, our models do not necessarily capture the dramatic growth in the Hispanic population since 1970. This omission warrants further consideration given the ways in which Hispanic immigration has reshaped both residential patterns and criminal processes in the United States. In reference to housing patterns, both Iceland (2009) and Frey (2014) suggest that increasing ethnic diversity is associated with decreasing segregation because Hispanics often serve as a "buffer" between initially white and black neighborhoods. The result is a relaxing of existing racial boundaries in urban areas and greater black-white integration. Equally important, there is now a growing consensus within criminology that despite considerable levels of socioeconomic disadvantage within the Latino community, increased Hispanic presence has an inhibiting influence on violence, a social phenomenon often referred to as the Latino Paradox (Lee and Martinez 2009; Sampson 2008). Thus, growth in the Hispanic population may be partially responsible for the observed trends in *both* our focal independent measure (segregation) and our dependent variable (homicide). It is precisely for this reason that Parker and Stansfield (2015) suggest that studies of homicide that fail to consider Hispanic presence may be suffer from model misspecification.

We address this concern directly in Table 4 by accounting for the Hispanic population in two ways. In addition to all covariates from Table 3, in model 1 we include a time-varying measure for the proportion of the population that is Hispanic. Then in model 2 we include an additional longitudinal control for the level of Hispanic-white segregation (measured as the index of dissimilarity) to capture the potential influence of ethnic residential patterns on black-white integration. If our results are simply a reflection of unobserved ethnic diversity, we should see a null black-white segregation effect with the addition of these measures.

(Table 4 about here)

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The results in Table 4 provide no evidence for this view, as the black-white segregation coefficients are reassuringly close to those reported in Table 3. Indeed, the effect of black-white segregation is substantively and statistically indistinguishable across these different specifications.

Addressing Reverse Causation

While the inclusion of fixed effects and multiple time-varying measures helps reduce bias in our estimates, they do little to assuage simultaneity concerns in the segregation-homicide link. Prior research provides strong theoretical and empirical justification to anticipate a reciprocal relationship between segregation and violence (Cullen and Levitt 1999; Liska et al. 1998). Thus, if levels of black-white segregation are a response to homicide, which in turn reinforces criminogenic conditions, it is empirically difficult to identify the direction of casual arrow.

We address these endogeneity concerns by using an instrumental variable (IV) approach. An IV approach is a two-stage process which involves first regressing the key predictor variable (i.e. the treatment) on an exogenous measure (i.e. the instrument) that is unrelated to the outcome measure (except indirectly through the treatment). This latter requirement is known as the exclusion restriction. The outcome measure is then regressed on the predicted treatment variable from the first equation. The overall aim of this approach is to remove the spurious correlation between the explanatory variable and unobserved characteristics. Thus, an IV helps remedy the issue of simultaneity bias by leveraging only that portion of the variability in the treatment (in our case, segregation can be thought of as the treatment) that is uncorrelated with the omitted variables to estimate the causal relation between the treatment and outcome (Angrist and Krueger 2001).

Drawing from Cutler and Glaeser (1997), we use the number of municipal and township governments to instrument for the predicted level of segregation in each MSA. This information comes from the 1962 Census of Governments and serves as a useful instrument for several reasons. First, unlike other forms of local governments, such as school or water districts, the number of municipal and township governments within an MSA is relatively constant over time.[12] Moreover, the instrument is measured temporally prior to our study period. Lastly, this instrument has been empirically vetted as an exogenous source of variation in segregation

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[12] Cutler and Glaeser (1997) report a correlation of .98 on the number of municipal and township governments between the 1962 and 1987 Census of Governments.

(Cutler and Glaeser 1997), including work that has explicitly modeled violent crime (De la Roca, Ellen, and O'Regan 2014). Thus, the instrument is theoretically appropriate for our study because the number of local governments is unlikely to directly affect homicide, thus plausibly satisfying the exclusion restriction. The instrument is, however, likely to shape patterns of segregation through a Tiebout mechanism, where more local governments result in greater variation in tax rates and services within a particular MSA, thus encouraging residential sorting across municipal boundaries. This is known as the relevance condition, which requires that the instrument induces a sufficiently strong change in the endogenous variable.

We test the relevance condition in model 1 of Table 5 which shows the first stage estimates of the IV model. Because the instrument is not time-varying, we follow previous research (Ousey and Kubrin 2014) and express all of the data in the IV analysis as first-differences. This serves the dual purpose of adjusting for all time-constant between MSA differences while also addressing nonstationarity in homicide trends within panel datasets (Spelman 2008). In line with our theoretical reasoning, the number of local governments 1962 is a significant predictor of increased black-white segregation between 1970 and 2010 and this relationship is robust to the inclusion of year effects and all MSA controls. In addition, the diagnostic statistics confirm the strength 1st stage relationship, as the Wald test on the excluded instrument (F-statistic = 22.0) is above the recommended cutoff of 10 (Staiger and Stock 1997).

Models 2 and 3 show the second stage estimates predicting the causal impact of segregation on white homicide. The substantive relationship in segregation-white homicide link is unchanged in the IV models. Adjusting for reverse causality and a multitude of control measures, in both models we observe a decrease in white homicide as a result of increased black-white segregation. The magnitude of this effect, however, does change appreciably in the IV models and there is a slight loss in efficiency in the estimated impact of segregation in our most rigorous model ($p > .052$), likely due to the loss of 20 percent of the cases in the first-differences framework (N = 412). In model 3, we find that a one percent increase in segregation is associated with a .14 reduction in the white homicide rate (compare to -.05 in Table 3). This could be due to either the OLS estimates understating the true impact of segregation on white homicide or to the shift in what is being estimated in the IV framework. Unlike the OLS models, the IV models estimate only the local average treatment effect (LATE). In our case, the IV estimates are local in

the sense that they are estimated only for the subset of MSAs for which the number of local governments induces a change in segregation patterns.

<div align="center">(Table 5 about here)</div>

Combined, the IV analysis bolsters confidence that the segregation-homicide link is not driven solely by selective migration patterns into and out of segregated places that simultaneously determine segregation and crime. On the contrary, the results presented in Table 5 provide strong causal evidence that the maintenance of segregation does indeed benefit whites, at least in terms of reduced risk of homicide victimization.

Explaining Discrepant Findings

The findings so far underscore three main conclusions: since 1970 segregation has 1) increased black homicide while 2) simultaneously decreasing white homicide victimization, thus 3) contributing to black-white homicide inequality. The second finding contradicts the argument by Krivo et al. (2009) and the latter finding challenges the work of Lafree et al. (2010), who found no impact of segregation on black-white homicide differences. Interestingly, both of these studies analyzed the impact of segregation at the city level.[13] This raises the possibility that, for whites, the segregation-homicide link may vary depending on the unit of analysis. This could be for at least three reasons. First, whites in central cities, even those in segregated neighborhoods, are almost by definition more geographically proximate to inner city crime and thus more exposed to the violence in segregated cities. Second, there are likely differences in the suburban and city populations that are correlated with criminal victimization. For example, income, property values, and educational quality tend to be higher in suburbs compared to cities (Reardon and Owens 2014; Swanstrom et al. 2004). Moreover, Cullen and Levitt (1999) demonstrate that highly educated households (a strong proxy for household income) and households with children were more likely to relocate to the suburbs in response to inner city crime. Thus, it is plausible that the most advantaged white households left central cities, leaving those with fewer resources behind. To the extent that socioeconomic disadvantage is correlated with increased risks of criminal victimization (Lauritsen and Rezey 2018), this might suggest that whites in segregated cities are more likely to be victims of homicide. Lastly, in line with the theorizing of Krivo et al. (2009), it is possible that segregated neighborhoods within cities undermines social organization,

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[13] Technically, Krivo et al. (2009) used tract-level data within cities. What is important for our purposes is that their analysis was limited to the effects of within-city segregation.

increasing white homicide. This view is also consistent with the argument laid out by Massey (2001), which suggests that whites are likely to share the burden of segregation when they are segregated *within the same city as blacks*.

We empirically evaluate this possibility in Table 6 using an alternative data source. Specifically, we leverage the same data used by Lafree and colleagues (2010).[14] This data set has several strengths for our purposes. Most notably, it is the only data source (to our knowledge) that is collected at the city-level (80 cities total), includes race-specific measures, and covers nearly the same time period (1960-2000). Though the variables are not identical to those utilized in our analysis, nearly all of the focal measures are, including black-white dissimilarity, measures of structural disadvantage (unemployment, poverty, and percent of children in single parent families), the crime prone population (males ages 15-24) and racial composition (percent black). Unlike homicide victimization, however, their measure of homicide comes from arrest reports. We think this distinction is unlikely to overly bias our results because the overwhelming majority of homicides tend to be intra-racial, which suggests data on offender race tracks victim information well (Wiersema, Loftin, and McDowall 2000).

Using the LaFree et al. (2010) data, we show three models. As in the main analysis, the results are weighted by the size of the white population and we report robust standard errors. In model 1 we include measures for the level of white disadvantage, the crime prone population, the percent black, and city and period fixed effects. In model 2, we include additional measures of black disadvantage and the black crime prone population. In both models the effect of segregation is *positive*, and in model 2, statistically significant. Based on the results in model 2, a 10 percent increase in city-level segregation corresponds with 2.4 additional white homicides (per 100,000). However, as previously stated, one limitation of this data is the inability to separate Hispanics from the white homicide rate. Thus in model 3 we attempt to indirectly gauge the level of bias from Hispanics by removing cities in California, Texas, and New York – the three most Hispanic populous states over this period. In this model, the effect of black-white segregation remains positive but is no longer significant.

Taken together, given the imprecise estimates in Table 6, we cannot confidently conclude that segregation increases white homicide within cities. What we can say with confidence,

however, is that the relationship between segregation and white homicide appears to vary depending on whether one focuses on the city or the broader metropolitan area. In this vein, it is important to reiterate that our MSA level analysis includes white homicides that occur in central cities. Thus, while the direction of the segregation-white homicide relationship may be positive (though perhaps null) within cities, the overall impact of segregation is negative because most whites live outside central cities and segregation is driven by cross-municipal sorting. The *net impact* then is one where blacks suffer and whites benefit from the criminological consequences of segregation.

Tables and Figures:

Table 1. Descriptive Statistics for Dependent and Explanatory Measures, 1970-2010

Measures	Overall Mean	(SD)	1970 Mean	(SD)	1980 Mean	(SD)	1990 Mean	(SD)	2000 Mean	(SD)	2010 Mean	(SD)
White Homicide Rate	4.27	2.67	4.40	2.82	6.14	3.51	4.64	2.23	3.26	1.53	2.94	1.36
Black Homicide Rate	31.07	15.83	42.23	16.04	35.20	14.06	36.03	15.34	21.51	9.89	20.38	9.95
B-W Index of Dissimilarity	64.47	12.50	75.78	9.54	68.03	10.07	63.54	10.92	59.60	10.84	55.39	10.38
Black Measures												
Poverty	27.61	7.45	30.14	8.77	26.83	5.07	28.79	7.93	24.57	6.32	27.69	7.51
Unemployment	12.16	4.98	7.56	2.93	11.76	4.12	13.02	4.05	11.19	2.72	17.27	5.13
Single-Parent Families	53.53	13.10	37.60	6.26	48.97	7.75	57.08	8.64	60.32	9.66	63.67	12.56
High Income	9.56	5.69	3.78	2.63	7.56	3.00	10.06	4.52	13.68	5.01	12.71	6.04
Manufacturing	16.52	9.83	22.92	10.73	22.59	10.42	15.58	7.38	12.71	5.90	8.79	4.43
Residential Instability	23.66	8.02	14.64	4.59	27.70	7.23	28.42	6.75	26.53	5.20	21.00	6.44
Young Men	9.24	2.53	9.51	2.87	11.09	3.46	8.71	1.66	8.06	1.10	8.81	1.64
Foreign-Born Pop.	3.55	5.58	0.49	0.75	2.13	2.61	3.06	4.41	4.60	6.19	7.49	7.94
White Measures												
Poverty	8.01	2.29	8.29	2.19	7.41	1.48	7.45	1.98	7.14	1.76	9.78	2.79
Unemployment	5.31	2.49	3.69	1.28	5.13	1.68	4.56	1.07	4.17	0.94	9.00	2.53
Single-Parent Families	17.68	5.51	10.89	2.17	15.05	2.30	17.62	2.58	20.72	3.37	24.12	4.48
High Income	27.13	9.56	16.23	4.12	23.52	5.24	28.97	7.61	34.16	7.95	32.79	8.75
Manufacturing	16.84	8.60	23.76	9.68	20.77	8.42	16.29	6.26	13.05	5.48	10.33	4.20
Residential Instability	17.76	6.03	12.59	3.50	23.72	5.74	20.54	4.89	18.60	3.79	13.37	2.97
Young Men	7.57	1.73	8.87	1.96	9.27	1.11	6.95	0.87	6.29	0.80	6.45	0.82
Foreign-Born Pop.	3.17	2.63	1.78	1.33	3.67	2.70	3.14	2.51	3.40	2.70	3.86	3.07
Overall Measures												
Percent Black	12.70	9.69	10.82	8.73	11.99	9.38	12.50	9.62	13.67	10.15	14.50	10.27
Incarceration Rate	283.42	189.98	93.68	31.35	138.88	62.03	294.08	115.09	446.08	176.55	444.36	148.95
Police per Capita	194.29	74.27	157.45	47.81	182.63	63.20	192.29	74.13	218.90	80.30	220.18	82.29
N	515		103		103		103		103		103	

Figure 1. Black and White Homicide Rates across Different Levels of Segregation, 1970-2010 (103 MSAs)
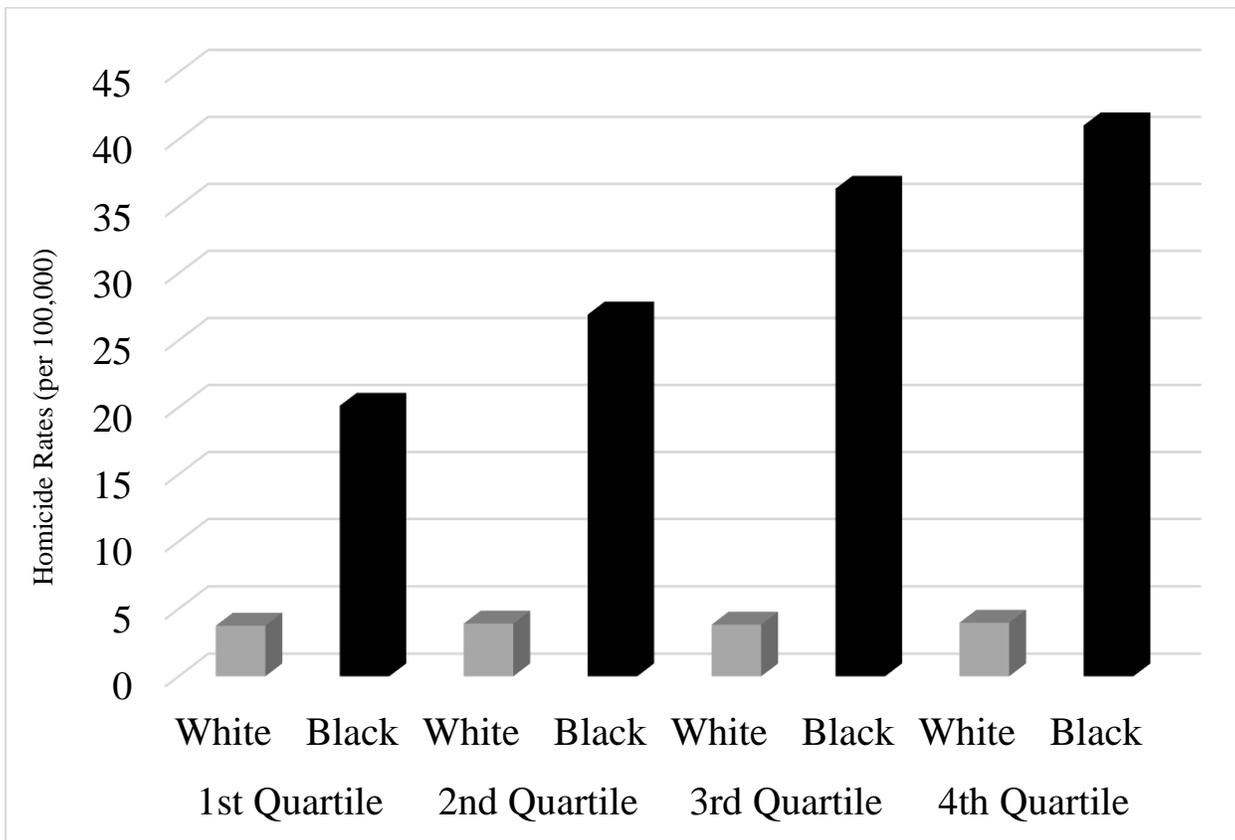
Table 2. Fixed Effects Models of Black Homicide Rates Regressed on Residential Segregation and Key Structural Characteristics, 1970-2010

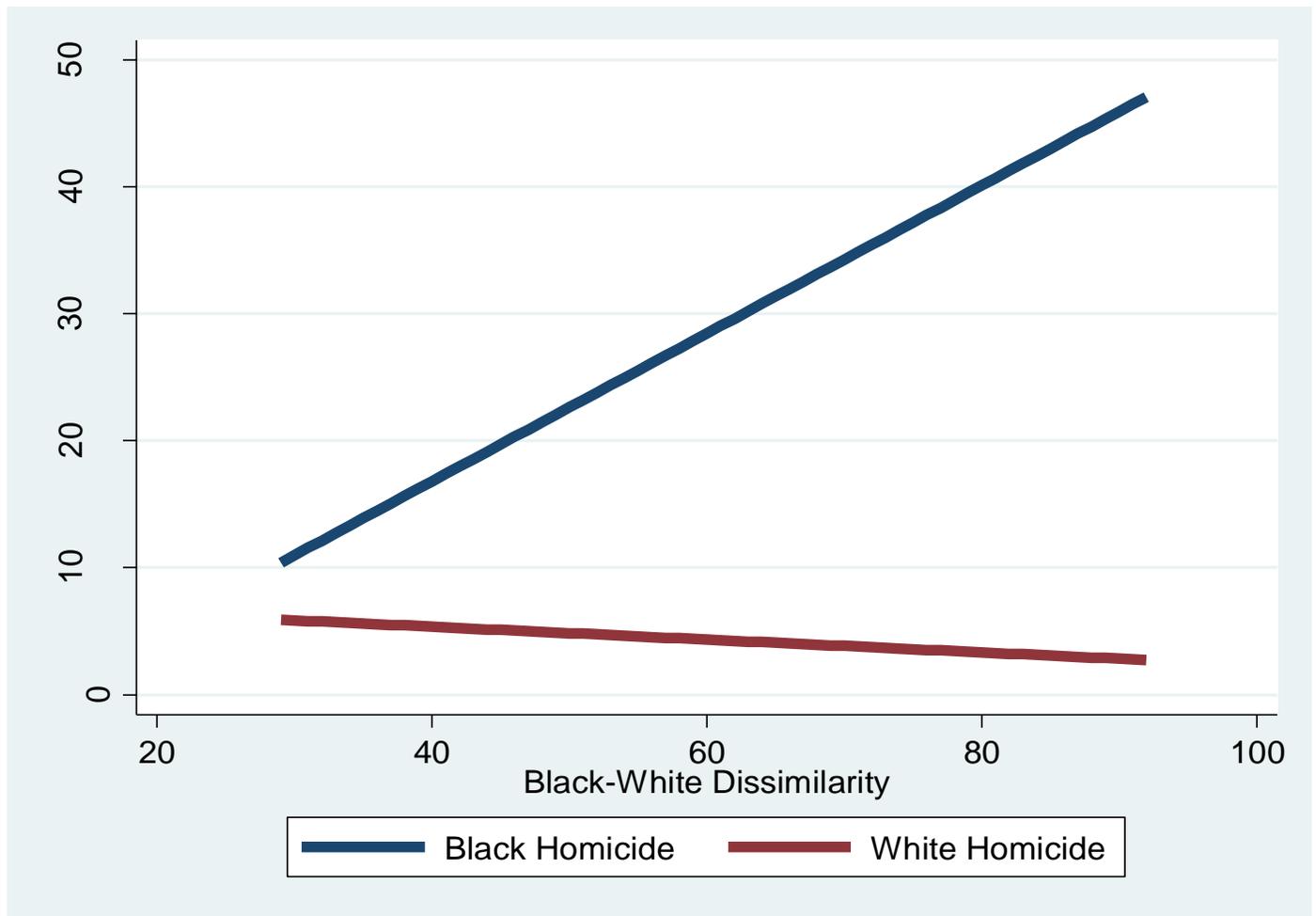| Explanatory Measures	Model 1		Model 2		
	b	SE	*b*	SE	Beta
Focal Measure					
B-W Segregation	0.49*	0.21	0.58*	0.23	0.43
Black Measures					
Disadvantage	-2.78	1.85	-0.26	1.98	-0.01
High Income	-0.10	0.30	-0.93*	0.36	-0.36
Manufacturing	-0.17	0.24	-0.59*	0.28	-0.29
Residential Instability	-0.21	0.25	-0.28	0.26	-0.11
Young Men	0.87	0.59	0.81	0.60	0.07
Foreign-Born Pop.	-0.47*	0.16	-0.57*	0.23	-0.30
White Measures					
Disadvantage			1.83	2.34	0.11
High Income			1.03*	0.29	0.69
Manufacturing			1.22*	0.48	0.57
Residential Instability			0.88†	0.55	0.31
Young Men			-1.49	1.08	-0.14
Foreign-Born Pop.			0.19	0.94	0.05
Overall Measures					
Percent Black	0.00	0.54	0.00	0.58	0.00
Incarceration Rate	0.00	0.00	0.00	0.00	0.06
Police per Capita	-0.05†	0.02	-0.05*	0.02	-0.22
Year Effects?	Yes		Yes		
MSA Effects?	Yes		Yes		
Constant	-7.26	21.95	-41.91	27.70	
Model Summary Information					
R^2	0.79		0.80		
Total Number of Obs. (N x T)	515		515		
Total Number of MSAs (N)	103		103		

Notes: † $p < .10$ * $p < .05$ (two-tailed test). Models are weighted by the MSA black population. Robust standard errors reported in parentheses.

Table 3. Fixed Effects Models of White Homicide Rates Regressed on Residential Segregation and Key Structural Characteristics, 1970-2010

Explanatory Measures	Model 1		Model 2		
	b	SE	*b*	SE	Beta
Focal Measure					
B-W Segregation	-0.05*	0.02	-0.05*	0.02	-0.27
White Measures					
Disadvantage	-0.35	0.27	-0.01	0.26	0.00
High Income	0.02	0.03	0.08*	0.04	0.35
Manufacturing	-0.08*	0.03	0.04	0.04	0.13
Residential Instability	0.23*	0.07	0.22*	0.07	0.56
Young Men	-0.08	0.13	-0.03	0.12	-0.02
Foreign-Born Pop.	0.16†	0.09	0.20*	0.09	0.33
Black Measures					
Disadvantage			-0.54*	0.17	-0.21
High Income			-0.10*	0.03	-0.24
Manufacturing			-0.09*	0.03	-0.35
Residential Instability			-0.03	0.02	-0.10
Young Men			0.07	0.05	0.05
Foreign-Born Pop.			-0.03	0.03	-0.10
Overall Measures					
Percent Black	0.20*	0.08	0.18*	0.09	0.60
Incarceration Rate	0.00	0.00	0.00†	0.00	-0.09
Police per Capita	0.00	0.00	0.00	0.00	-0.08
Year Effects?	Yes		Yes		
MSA Effects?	Yes		Yes		
Constant	5.66	3.25	3.26	2.78	
Model Summary Information					
R^2	0.81		0.82		
Total Number of Obs. (N x T)	515		515		
Total Number of MSAs (N)	103		103		

Notes: † $p < .10$ * $p < .05$ (two-tailed test). Models are weighted by the MSA white population. Robust standard errors reported in parentheses.

Figure 2: Predicted Homicide Rates for Blacks and White Across Range of Segregation, 1970-2010

**Table 4. Fixed Effects Models of White Homicide Rates, 1970-2010:
Accounting for Hispanic Population Growth and Residential Patterns**

Explanatory Measures	Model 1		Model 2	
	b	SE	b	SE
Focal Measure				
B-W Segregation	-0.05*	0.02	-0.05*	0.02
Hispanic Measures				
Percent Hispanic	-0.02	0.04	-0.02	0.04
H-W Segregation			0.03	0.02
White Measures				
Disadvantage	0.01	0.26	0.03	0.26
High Income	0.08*	0.04	0.07*	0.04
Manufacturing	0.04	0.04	0.04	0.04
Residential Instability	0.21*	0.08	0.23*	0.08
Young Men	-0.02	0.12	-0.03	0.11
Foreign-Born Pop.	0.23*	0.10	0.20*	0.10
Black Measures				
Disadvantage	-0.54*	0.17	-0.56*	0.17
High Income	-0.10*	0.03	-0.10*	0.03
Manufacturing	-0.10*	0.03	-0.09*	0.03
Residential Instability	-0.03	0.02	-0.03	0.02
Young Men	0.06	0.05	0.06	0.05
Foreign-Born Pop.	-0.03	0.03	-0.03	0.03
Overall Measures				
Percent Black	0.16†	0.09	0.16†	0.09
Incarceration Rate	0.00	0.00	0.00†	0.00
Police per Capita	0.00	0.00	0.00	0.00
Year Effects?	Yes		Yes	
MSA Effects?	Yes		Yes	
Constant	3.57	2.92	2.02	3.02
Model Summary Information				
R^2	0.82		0.82	
Total Number of Obs. (N x T)	515		515	
Total Number of MSAs (N)	103		103	

Notes: † $p < .10$ * $p < .05$ (two-tailed test). Models are weighted by the MSA white
population. Robust standard errors reported in parentheses.

Table 5. 1st and 2nd Stage Instrumental Variable Models Estimating the Effect of Segregation on White Homicide Rates, 1970-2010

Explanatory Measures	1st Stage - Model 1 B-W Segregation		2nd Stage - Model 2 White Homicide		2nd Stage - Model 3 White Homicide	
	b	SE	b	SE	b	SE
Focal Measures						
Number of Municipal Governments	0.01*	0.00				
B-W Segregation			-0.16*	0.08	-0.14*	0.07
White Measures						
Disadvantage	-1.86*	0.63	-0.86*	0.31	-0.62†	0.32
High Income	-0.04	0.09	0.04	0.03	0.06	0.04
Manufacturing	-0.25*	0.11	-0.12*	0.06	-0.06	0.06
Residential Instability	-0.30*	0.12	0.25*	0.10	0.27*	0.10
Young Men	0.96*	0.29	0.09	0.18	0.07	0.18
Foreign-Born Pop.	0.31	0.25	0.45*	0.10	0.50*	0.12
Black Measures						
Disadvantage	0.79†	0.45			-0.23	0.16
High Income	-0.01	0.11			-0.04	0.03
Manufacturing	-0.02	0.07			-0.04	0.03
Residential Instability	-0.23*	0.05			-0.05	0.03
Young Men	-0.03	0.13			0.14*	0.05
Foreign-Born Pop.	-0.13†	0.08			-0.05†	0.03
Overall Measures						
Percent Black	0.31†	0.19	0.28*	0.12	0.27*	0.11
Incarceration Rate	0.00	0.00	0.00	0.00	0.00	0.00
Police per Capita	0.01*	0.00	0.00	0.00	0.00	0.00
Year Effects?	Yes		Yes		Yes	
Constant	-3.59*	1.82	-3.75*	1.59	-3.07*	1.50
Model Summary Information						
R^2	0.39		0.54		0.57	
F-test	21.94		--		--	
Total Number of Obs. (N x T)	412		412		412	
Total Number of MSAs (N)	103		103		103	

Notes: † $p < .10$ * $p < .05$ (two-tailed test). All variables expressed as first differences. The number of municipal governments is used to instrument for changes in segregation in models 2 and 3. Models are weighted by the MSA white population. Robust standard errors reported in parentheses.

Table 6. Fixed Effects Models of White Homicide Rates *Within Cities*, 1960-2010: Analysis Using Lafree et al. 2010 data

Explanatory Measures	Model 1		Model 2		Model 3 (no TX, CA, NY)	
	b	SE	*b*	SE	*b*	SE
Focal Measure						
B-W Segregation	0.12	0.10	0.24*	0.10	0.14	0.10
White Measures						
Disadvantage	2.21*	1.12	3.93*	1.78	4.33*	1.81
Young Men	-0.32	0.38	-0.43	0.40	-0.44	0.34
Black Measures						
Disadvantage			-4.37†	2.46	-3.25	2.88
Young Men			-0.05	0.22	-0.09	0.22
Overall Measures						
Percent Black	0.13	0.27	0.15	0.25	0.47	0.30
Year Effects?	Yes		Yes		Yes	
City Effects?	Yes		Yes		Yes	
Constant	-4.72	9.39	-15.58	13.45	-19.53	17.02
Model Summary Information						
R^2	0.64		0.66		0.63	
Total Number of Obs. (N x T)	320		320		232	
Total Number of Cities (N)	80		80		58	

Notes: † $p < .10$ * $p < .05$ (two-tailed test). Models are weighted by the city white population. Robust standard errors reported in parentheses. Model 3 excludes cities in Texas, California, and New York.

Appendix:

Appendix to be added

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