Gentrification and the Changing Structure of Segregation:

A New Decomposition Approach by Race, Class, and the City-Suburb Divide

Jackelyn Hwang

Stanford University

Elizabeth Roberto

Rice University

Jacob S. Rugh

Brigham Young University

Abstract: As cities transform, debates have centered on the degree to which gentrification spatially reorganizes and exacerbates racial and class inequality. This study examines how gentrification is associated with the structure of segregation from 1990-2010 across 100 metropolitan areas. Using data from the US Census and the American Community Survey and a new decomposition approach for measuring segregation, we examine how the prevalence of gentrification across cities are associated with changes in segregation for racial and ethnic groups by socioeconomic status and the degree to which this is occurring between and within central cities and suburbs across metropolitan areas. While gentrification is associated with overall decreases in income segregation, it differentially affects segregation levels of poor residents by racial and ethnic groups and differentially across central cities and suburbs. The results demonstrate how contemporary urban changes simultaneously integrate some groups in some places yet further segregate others.

Keywords: segregation, gentrification, urban, suburban, race, class

Gentrification and the Changing Structure of Segregation:

A New Decomposition Approach by Race, Class, and the City-Suburb Divide

Nearly 40 years ago, Thomas Pettigrew (1979) observed that residential segregation was the "structural linchpin" of racial stratification in the U.S. In the decades that followed, scholars demonstrated the persistence of segregation and its deleterious consequences (e.g., Massey and Denton 1993; Charles 2003). Recent evidence, however, has spurred new debates on the degree to which segregation is still a concern. The segregation of blacks, measured by traditional indices of dissimilarity and isolation, has declined in recent decades across metropolitan areas (Logan and Stults 2011; Glaeser and Vigdor 2012; Rugh and Massey 2014), and middle-class and affluent blacks have grown in numbers and are no longer relegated to poor and minority neighborhoods (Quillian 1999; Iceland and Wilkes 2006). Nonetheless, the segregation of blacks remains high, particularly in large metropolitan areas with large, poor black populations (Rugh and Massey 2014), and the socioeconomic gap between whites and blacks has grown despite the growth of middle-class blacks (Massey 2007). Moreover, recent declines in segregation at the neighborhood-level have been offset by increases in segregation between municipalities, as the inner-ring suburbs outside of central cities have become more diverse and less affluent (Lichter et al. 2015). Studies also report increases in the segregation of Hispanics (Rugh and Massey 2014) and growing socioeconomic segregation (Bischoff and Reardon 2014; but see also, Logan 2018). Whereas the racial residential segregation of blacks once defined urban America, the changing color line in the U.S. and the sharp rise in inequality and accompanying growth in class segregation suggest a "new and more complex urban ecology in which race and class interact powerfully to determine individual and family well-being" (Massey 2016:6).

Although gentrification—the influx of middle- and upper-class residents and investment into previously low-income, central city neighborhoods—has become increasingly more rapid and widespread, particularly since the late 1990s (Hackworth and Smith 2001; Baum-Snow and Hartley 2016; Hwang and Lin 2016), we know very little about its effect on broader patterns of segregation (Freeman

2009). Research on gentrification's consequences on residential mobility patterns has instead primarily focused on residential displacement. While gentrification implies income-mixing, displacement—either by directly pushing out preexisting residents in gentrifying neighborhoods or by reducing low-income residents' access to moving into these neighborhoods that were once available options—has been a central concern and empirical debate (Brown-Saracino 2017). Both versions of displacement inevitably relegate low-income residents, particularly renters, to a shrinking pool of affordable neighborhood choices and potentially contribute to broader trends associated with the suburbanization of poverty (Kneebone and Barube 2013).

While gentrification in its classic conception is a class-based transformation, race has increasingly been an important underlying subtext of debates surrounding gentrification's implications in the U.S. context (Brown-Saracino 2017). Gentrification has historically been less likely to occur in predominantly minority, especially black, neighborhoods compared to others, but it has become more prevalent in these neighborhoods in recent decades compared to the past (Freeman 2009; Owens 2012; Freeman and Cai 2015; Hwang 2016; Owens and Candipan 2018). Transformations in public housing policy (Hyra 2012; Tach and Emory 2017), the large-scale decline in crime (Ellen et al. 2016; Sharkey 2018), the expansion of lending during the late 1990s and early 2000s (Wyly and Hammel 2004), and changes in neighborhood preferences (Hyra 2017) spurred changes that increasingly bring capital investment and higher-class residents into long disinvested minority neighborhoods. These changes are embedded in concerns of growing income inequality and the increased concentration of affluent residents (Reardon and Bischoff 2011; Brown-Saracino 2017). Thus, urban transformations associated with gentrification in recent decades have likely consequences on the structure of residential segregation by both race and class and in central cities and suburbs.

In this article, we examine how the prevalence of gentrification affects the spatial restructuring of racial and class segregation from 1990 to 2010. Gentrification is a process of residential sorting that alters historically persistent socioeconomic and racial neighborhood hierarchies. We contribute to literature on urban change by looking beyond residential displacement from gentrifying neighborhoods to broader

patterns of racial and class spatial inequality. We also add to research on segregation by examining segregation of specific socioeconomic groups within race groups and the spatial structure of segregation of these groups, rather than only considering segregation by race or segregation by class separately and considering gentrification's implications beyond just central cities to the suburbs. Given the trends described above, we focus on the residential segregation of poor residents from all nonpoor residents and whether these trends differ across racial and ethnic groups, as well as the residential segregation of minority groups from whites and whether these trends differ by tenure status, in the 100 largest metropolitan areas. We examine differences in segregation in cities and suburbs using a decomposable measure of segregation—the Divergence Index (Roberto 2016). Our study builds on recent advances in the measurement of segregation and bridges literature on urban change to shed light on how gentrification is restructuring segregation in the contemporary city.

Gentrification and Urban Restructuring

Over the last several decades, the spatial sorting of residents by race and class shifted. Whereas the continued outmigration of middle- and upper-class, primarily white, residents to the suburbs and the persistence of poor and minority residents relegated to central cities once defined metropolitan landscapes, middle- and upper-class residents have increasingly chosen to live in central city neighborhoods, often in low-income neighborhoods that were once disinvested and in decline. While the increasing prevalence of gentrification to more cities and neighborhoods in the twenty-first century can decrease income segregation through the income mixing that occurs in gentrifying neighborhoods, the influx of high-socioeconomic status (SES) residents into previously low-SES neighborhoods can also increase income segregation over time if gentrification leads to the redistribution of disadvantaged residents.

In general, gentrification can have two potential consequences of residential sorting patterns. First, it can displace residents living in gentrifying neighborhoods. Second, because it makes previously low-income neighborhoods more expensive, it reduces the pool of affordable neighborhoods available to

low-SES residents. Residential displacement has been central to debates on gentrification and can take many forms (Atkinson 2004). When neighborhoods gentrify and increase in value, preexisting residents may move because of the increased financial burdens imposed by the increased rents, property taxes, or cost of living; or, they may be forced to move through evictions or harassment or neglect by landlords hoping to drive existing residents out to attract new ones that can pay higher values (Newman and Wyly 2006). Property owners or developers may offer cash incentives to get the current renters or homeowners to leave to renovate or demolish properties and take advantage of the increased exchange value of the land. Finally, increasing costs, the changing character of the neighborhood, the loss of community and networks, and experiences of exclusion may also contribute to the outmigration of low-SES residents from gentrifying neighborhoods.

While these experiences are well documented in qualitative research and media accounts, quantitative evidence on the extent to which gentrification increases the likelihood of outmigration among disadvantaged residents is weak (Newman and Wyly 2006; Brown-Saracino 2017). Most quantitative studies tracking residents over time do not find that low-SES, minority, renting, or elderly residents in gentrifying neighborhoods are more likely to move from their neighborhoods compared to those in low-income neighborhoods that do not gentrify (Freeman 2005; McKinnish et al. 2010; Ellen and O'Regan 2011; Ding et al. 2016; Freeman et al. 2016; Martin and Beck 2018). The lack of widespread displacement may be due to higher rates of subsidized and vacant housing in gentrifying neighborhoods that allow for both the influx of new residents without necessarily forcing preexisting residents to move, at least in the short-term (Ellen and O'Regan 2011; Ding et al. 2016). Second, disadvantaged residents in low-income neighborhoods that do not gentrify regularly experience residential instability (Newman and Wyly 2006; Desmond 2016). Thus, displacement may certainly occur in gentrifying neighborhoods, but it also occurs in nongentrifying ones and potentially at higher rates.

Regardless of whether preexisting residents in gentrifying neighborhoods move at elevated rates—where most of the prior research has focused, when neighborhoods gentrify, they become less accessible to disadvantaged residents. As a result, there are fewer affordable neighborhood options in

central cities, thus relegating low-SES residents to a smaller set of neighborhoods in central cities or increasing their movement to the suburbs—a process of indirect or exclusionary displacement (Newman and Wyly 2006; Davidson 2008; Slater 2009). Given the high degree of residential instability particularly for renters among disadvantaged residents in both gentrifying neighborhoods and low-SES neighborhoods that do not gentrify, gentrification may be accelerating these shifts. Indeed, Howell and Timberlake (2014) show that increasing affordable housing supply availability is associated with increasing poverty suburbanization across U.S. metropolitan areas. Gentrification, therefore, may increase income segregation within cities but may contribute to decreases in segregation in the suburbs, as well as decreases in the separation of income groups between central cities and suburbs. The literature thus far presents the following competing hypotheses:

- Hypothesis 1a: If direct or indirect displacement is not widespread, gentrification decreases income segregation in central cities.
- Hypothesis 1b: Alternatively, if direct or indirect displacement are widespread, gentrification increases income segregation in central cities and decreases income segregation in the suburbs and between cities and suburbs.

Given extensive research on the disadvantages that minority residents face in the housing market due to discriminatory processes throughout every step of the process (Massey and Denton 1993; Charles 2003), gentrification may affect the segregation of poor residents differently across racial and ethnic groups, particularly if displacement is occurring. We expect that increases in the segregation of poor minority residents from nonpoor residents in central cities resulting from gentrification may be greater compared with the segregation of poor white residents. Howell and Timberlake (2014) find that affordable housing supply in the suburbs predicts the suburbanization of poor blacks and especially Latinos. However, given processes of stratification, displaced minority residents suburbanizing may be relegated to certain areas such that the segregation of poor minority residents from nonpoor residents in the suburbs may increase. The leads to the following hypothesis:

- Hypothesis 2: If displacement is widespread, gentrification has larger positive association

with the segregation of poor minority residents from nonpoor residents compared with the segregation of poor white residents both within central cities and in the suburbs.

Gentrification also has implications for racial and ethnic segregation. Gentrification in minority neighborhoods would reduce the segregation of minorities from white residents if displacement did not occur and gentrifiers were primarily white. The extent to which gentrification affects minority neighborhoods, however, is the center of another debate within the scholarship on gentrification (Brown-Saracino 2017). Whereas some scholars have even redefined the term gentrification as a movement of whites into African-American and other minority neighborhoods (Brown-Saracino 2017), others have emphasized the persistence of poor and minority neighborhoods in central cities (Owens 2012; Sampson 2012; Hwang and Sampson 2014). Stability may be the dominant trajectory of poor minority neighborhoods, but these neighborhoods have increasingly experienced gentrification over the last couple decades compared to the past. Gentrification, when it was slow and sporadic, once nearly avoided predominantly minority, particularly African-American neighborhoods (Smith 1996; Freeman 2009; Hwang 2016) or would only occur when gentrifiers were middle-class co-ethnics (Bostic and Martin 2003; Pattillo 2007).

Nonetheless, ethnographic accounts describe how minority neighborhoods that first experienced an influx of middle-class minorities subsequently attracted an influx of white, middle-class residents (Pattillo 2007; Hyra 2017). In national analyses over time, Freeman and Cai (2015) observe an uptick in the influx of whites into predominantly black neighborhoods associated with gentrification from 2000-2010 relative to past decades, and Owens (2012) finds that the share of minority urban neighborhoods that experience socioeconomic ascent increased in the 2000s compared to the two prior decades. Further, Owens and Candipan (2018) show that majority-minority neighborhoods that experience socioeconomic ascent are more likely to experience an in-migration of white residents replacing minority ones. Scholars attribute this shift to a variety of changes that have occurred over the last couple decades, including shifts in public housing, declines in crime, the expansion of mortgage lending during the housing boom, and changing preferences (Wyly and Hammel 2004; Hyra 2012; Goetz 2011; Ellen et al. 2016; Hyra 2017;

Tach and Emory 2017; Sharkey 2018).

Altogether, this research suggests that the prevalence of gentrification marked by the influx of whites into minority neighborhoods has increased in recent decades. If more minority neighborhoods are gentrifying and displacement does not occur, racial segregation of minorities from whites and the segregation of poor minorities from nonpoor residents may decline in central cities. Nonetheless, if both direct and indirect displacement were widespread, especially for poor or renting minority residents, the segregation of these residents in central cities would increase but may decrease in the suburbs as these residents face a smaller set of affordable neighborhood choices within central cities and a growing set of affordable choices in the suburbs. Such trends in the segregation from whites may also be more acute for minority renters compared with minority owners.

The following hypotheses emerge from this literature:

- Hypothesis 3a: Because gentrification by whites increasingly affects minority neighborhoods, if direct or indirect displacement is not widespread, gentrification decreases the segregation of poor minority residents from nonpoor residents, affluent white residents from nonaffluent residents, and minority residents from whites in central cities.
- Hypothesis 3b: Alternatively, if direct and indirect displacement is widespread, gentrification increases segregation of poor minority residents from nonpoor residents, affluent white residents from nonaffluent residents, and minority residents from whites in central cities but decreases segregation in the suburbs and the segregation between central cities and suburbs.
- Hypothesis 4: Gentrification has a larger positive association with the segregation of minority renters and whites compared with the segregation of minority owners and whites both in central cities and suburbs.

To our knowledge, only Freeman (2009) examines the relationship between gentrification and segregation. Freeman (2009) examines racial segregation and class segregation separately and finds weak and inconsistent relationships with gentrification. For income segregation, measured by an information theory index, the study finds that gentrification reduces income segregation measuring gentrification with

his own gentrification measure across the U.S. but a much weaker relationship based on field surveys across 23 cities. Gentrification, as measured by Freeman's (2009) operationalization, increases racial segregation but decreases it based on the field survey measures. While informative, this study only examines gentrification occurring prior to 2000, when gentrification was less prevalent, particularly among minority neighborhoods. Further, the results are highly dependent on the gentrification measure used. Whereas the field surveys generally capture gentrification that occurred during the 1970s and 1980s (Hwang 2016), Freeman's (2009) measure is relatively liberal in defining gentrification (McKinnish et al. 2010; Barton 2016). Lastly, the study uses measures of segregation that limit the ability to consider race and class together and to distinguish differences in central cities and suburbs.

Segregation Trends

Past research documenting segregation trends examine racial and income segregation separately. Over the last 50 years, large metropolitan areas have seen slow but steady declines in the residential segregation of blacks and steady levels of segregation for Hispanics and Asians. Rugh and Massey (2014) show a drop from 78 in 1970 to 60 in 2010 across all metropolitan areas in the average black-white dissimilarity index—a commonly used measure of unevenness between two groups in a metropolitan area—and a drop in the spatial isolation of blacks—measured by the P* index—from 65 in 1970 to 46 in 2010. Hispanic-white dissimilarity only changed from 46 to 49 from 1970 to 2010, and Asian-white dissimilarity only changed from 39 to 41 over the period (Rugh and Massey 2014). Nonetheless, the spatial isolation of these latter groups grew over the period, increasing from 27 to 47 for Hispanics and from 10 to 21 for Asians (Rugh and Massey 2014). These latter trends are unsurprising given the sharp rises in their populations over the period.

Despite the optimism that some of these trends point toward, research demonstrates how other trends offset such progress, particularly for blacks. Changes in the spatial isolation of blacks are largely attributable to increased exposure of blacks to other minorities (Rugh and Massey 2014), and the exposure of blacks to whites has remained steady (Logan and Stults 2011). Further, the segregation of

blacks from whites remains much higher than the segregation of other minorities from whites: In 2010, the average Hispanic-white and Asian-white dissimilarity indices across metropolitan areas were 49 and 41, respectively (Rugh and Massey 2014). Lichter and colleagues (2015) demonstrate that the geographic scale of segregation, measured using the Theil Index, has shifted in recent decades for blacks. While the segregation of blacks from whites declined at the neighborhood level from 1990 to 2010, the segregation of blacks from whites between municipalities increased, reflecting a process such that cities and towns, rather than neighborhoods, exclude racial minorities (Lichter et al. 2015). As suburban areas, particularly those in close proximity to central cities, increasingly serve as destinations for new immigrants, as well as historically disadvantaged minority populations who may be increasingly priced out of gentrifying central cities, affluent whites and minority residents may be increasingly concentrating in specific suburban communities and places (Howell and Timerblake 2014).

Other research has demonstrated a rise in income segregation. Using the rank-order information theory index, Reardon and Bischoff (2011) find increases in income segregation from 1970 to 2000 across the 100 largest metropolitan areas, and they show that this rise was larger for black families relative to white families. The segregation of both poor families and affluent families increased substantially over the period for both blacks and whites (Reardon and Bischoff 2011). Altogether, these trends support a pattern of black exceptionalism, despite declines in black-white segregation (Parisi et al. 2011).

In the context of these trends, a study of segregation of both race and class is necessary for understanding the structure of segregation today, particularly as it relates to gentrification. While Reardon and Bischoff (2011) consider income segregation *within* race groups, the trends discussed above and the process by which gentrification unfolds suggests that, to understand the consequences of gentrification, we should examine the segregation specifically of low-socioeconomic status (SES) residents of different racial and ethnic groups relative to higher-SES residents and consider central cities and suburbs separately.

Measuring Segregation by Race and Class

Recent developments in the measurement of segregation allow us to assess the segregation of subsets of the population by race and class, as well as the extent to which these groups are segregated between central cities and suburbs rather than within them. Traditionally, studies of segregation rely on the dissimilarity index to measure the unevenness of two groups in a geographic area. The properties of the measure, however, prohibit the ability to examine the extent to which various aspects of the urban landscape within metropolitan areas shape overall segregation measures for a metropolitan area. As an aspatial measure that cannot be decomposed, the dissimilarity index could remain unchanged in a metropolitan area that can have changing spatial distributions of its populations.

Massey et al.'s (2009) analysis of the black-white dissimilarity index using units of analysis at varying geographic aggregations (e.g., tracts, cities, counties, and states) shows that the declines in black-white dissimilarity occur at the tract-level but not at larger aggregations. These findings suggest that processes at different geographic aggregations may be occurring that offset trends in segregation at other geographic aggregations (Lichter et al. 2015). A primary advantage of decomposable indices is that one can assess the extent to which metropolitan-wide segregation measures are due to differences within subareas or due to differences between them. Given the trends in recent settlement patterns in the U.S. discussed above, examining the different components of segregation allow us to uncover the increasingly complex urban ecology of segregation. Recent studies employing the decomposable Theil Index demonstrate changing trends in the components of black-white segregation, underscoring the advantage of decomposing segregation measures to better understand its structure under contemporary demographic trends (e.g., Fischer 2008; Lichter et al. 2015).

To construct the segregation measures, we use tract-level data from the 1990 and 2000 U.S. Censuses and the American Community Survey 2010—2014 5-year estimates. We harmonize the 1990 and 2000 U.S. Census data to 2010 U.S. Census boundaries using Brown University's Longitudinal Tract Database crosswalk file, which harmonizes data to 2010 U.S. Census boundaries using population and areal weighting (Logan et al. 2014). For each census tract in each of the 100 largest metropolitan areas, we use data based on the income distribution for each race group. We define residents as poor if their

household income was less than 100% of the poverty line for a family of four and affluent if their household income was greater than four times the poverty line for a family of four. For this analysis, we first calculate segregation for racial and ethnic groups and income separately, comparing the following group pairs: poor-nonpoor, affluent-nonaffluent, Black-white, Hispanic-white, and Asian-white. In addition, we calculate the segregation for racial and ethnic groups by class for the following pairs: black poor-all nonpoor, Hispanic poor-all nonpoor, Asian poor-all nonpoor, white poor-all nonpoor, white affluent-all non-affluent.

To measure segregation, we use a segregation index developed by Roberto (2016) called the Divergence Index (*D*) and is based on relative entropy—an information theoretic measure also known as Kullback-Leibler (KL) divergence (Kullback 1987; Cover and Thomas 2006). It measures the difference between the composition of groups within a smaller spatial unit relative to the composition in a larger aggregate spatial unit. The Divergence Index differs from the Theil Index because it compares the population *compositions*, rather than the *diversity*, of smaller spatial units to the overall composition of a larger aggregate spatial unit (Roberto 2016). Measuring the difference between compositions, rather than diversity per se, is advantageous because it allows us to directly assess which groups are over- or under-represented relative to their overall proportions, whereas diversity measures lose information about specific groups and instead focus on variety or the relative quantity of groups.

Conceptually, *D* is a measure of how surprising are the compositions of smaller geographic areas (e.g., census tracts) given the overall composition of a larger geographic area (e.g., metropolitan area). If all smaller geographic areas within a larger geographic area have the same composition as that of the larger geographic area, *D* would equal 0 and would indicate no segregation, while higher values indicate more segregation. For measuring segregation using census tracts as our smaller unit of analysis and metropolitan areas as the larger geographic unit, formally, *D* is represented as:

$$D = \sum_{i=1} \frac{\tau_i}{T} \sum_{m=1} \pi_{im} \log \frac{\pi_{im}}{\pi_m},$$

where τ_i is the population count for tract *i*, *T* is the overall metropolitan population count, π_{im} is group *m*'s proportion of the population in tract *i*, and π_m is group *m*'s proportion of the overall metropolitan population.

D, our measure of the total segregation in a metropolitan area, can be formally decomposed into the sum of two quantities: 1) the segregation *between* subareas (e.g., the central city and suburbs), and 2) the segregation *within* the subareas, which is the population weighted mean of segregation within each subarea. The first quantity, the between-subarea segregation, or macro-*D*, measures the segregation of two groups between the subareas within the metro area. It compares the composition of the groups of interest (e.g., black poor and all nonpoor, white affluent and all non-affluent) within each subarea to the composition of the groups of interest in the entire metropolitan area. Macro-*D* can be expressed as:

$$D_{between} = \sum_{j=1} \frac{T_j}{T} \sum_{m=1} \pi_{jm} \log \frac{\pi_{jm}}{\pi_m},$$

where T_j is the population count for subarea *j* and π_{jm} is group *m's* proportion of the population in subarea *j*.

The second quantity, the segregation within each subarea, or micro-*D*, measures the segregation of census tracts within each subarea. For each subarea, we compare the composition of the groups of interest in each census tract within the subarea to the composition of the groups of interest across the entire subarea. Thus, the measure represents how surprising the composition of each tract within the subarea is, given the subarea's overall composition. For each subarea *j*, the segregation with the subarea is defined as:

$$D_j = \sum_{i \in S_j} \frac{\tau_i}{T_j} \sum_{m=1} \pi_{im} \log \frac{\pi_{im}}{\pi_{jm}},$$

where S_j is the set of census tracts in subarea *j*. We calculate the overall micro-*D* as the weighted average of the segregation within each subarea, weighted by each subarea's share of the metropolitan population.

$$D_{within} = \sum_j \frac{T_j}{T} D_j.$$

The total D is the sum of $D_{between}$ and D_{within}, and this value is equivalent to measuring the segregation of all tracts within the metropolitan area.

The components that we use in our segregation decomposition—the primary central city and the suburbs—are consistent with the components used in Fischer's (2008) decomposition analysis with the Theil Index but are distinct from other recent studies that use different divisions of metropolitan space. For example, Lichter et al.'s (2015) study categorizes areas outside the central city into two types of municipalities—suburban places and the exurban fringe—and considers the segregation between suburban municipalities as part of the overall between component. Our decomposition approach should further be distinguished from research that uses spatial measures to examine patterns of micro- and macro-segregation by comparing the segregation of "ecocentric local environments" defined at various geographic distances (Lee et al. 2008; Reardon et al. 2008, 2009).

Methods

Modeling Strategy

The spread of gentrification to more neighborhoods and cities in recent decades and findings that black exceptionalism may no longer hold suggest that segregation by race and class across metropolitan areas has declined. Racial and income integration, however, may be only temporary as both direct and indirect residential displacement occur, resulting in the subsequent re-segregation of poor and minority residents within central cities or the suburbanization of them. We test our hypotheses by assessing variation in D, macro-D, micro-D within suburbs, and micro-D within cities, separately, across the 100 largest metropolitan areas in the U.S. based on their 2000 population. Metropolitan areas are based on the 2009 Census metropolitan divisions. We only consider the central city in the metropolitan area to be the primary or largest city in the metropolitan area, and we consider all other areas of the metropolitan area to

be part of the "suburban" subarea.[1] In our analysis, we consider separate group pairs of interest by race (black-white, Hispanic-white, Asian-white), income (poor-nonpoor, affluent-nonaffluent), and a combination of race and income (black poor-nonpoor; Hispanic poor-nonpoor; Asian poor-nonpoor; white poor-nonpoor; white affluent-nonaffluent). We also conducted supplementary analyses for group pairs by race and housing tenure status to examine the degree to which black, Asian, and Hispanic renters and owners are segregated from whites (black renters-whites; black owners-whites; Hispanic renters-whites; Hispanic owners-whites; Asian renters-whites; Asian owners-whites). We present only some of these latter results for brevity.

In separate models, we estimate levels of overall *D*, overall macro-*D*, micro-*D* within suburbs, and micro-*D* within cities at the end of each period, as well as changes in segregation levels over each period using fixed-effects regression models. For models predicting changes in segregation levels, we use lagged regression models and control for the level of the outcome at the beginning of the period. For models predicting the components of overall *D* (e.g., macro-*D* and micro-*D*), we also control for the overall *D* (level or changes), thereby accounting for variation in the overall levels of segregation across metropolitan areas. Our final analytic dataset contains stacked data for each combination of group pairs, time period (1990—2000 and 2000—2010), and metropolitan area. We use metropolitan area fixed-effects models to control for unobserved heterogeneity for time-invariant characteristics across metropolitan areas. In addition, we use time fixed effects by including a dummy variable for the 2000—2010 period to account for time trends. The first set of models presented includes group pairs together for income, race, race by income, and race by tenure status, and the second set of models considers each group pair separately.

Explanatory Variables

[1] We recognize that metropolitan areas also contain areas that are considered to be "exurban" fringe areas. Given our focus on central city transformations for this analysis, we do not separately examine changes in these areas.

The main urban transformations on which we focus in our analysis is gentrification. Consistent with most characterizations of gentrification in academic scholarship, we conceptualize gentrification to be a neighborhood-level socioeconomic transformation comprised of both an influx of middle-and upper-class residents and an increase in housing prices in previously low-income, central city neighborhoods.[2] We operationalize the extent of gentrification in a metropolitan area's central city using data from Brown University's Longitudinal Tract Data Base for the Census 1990 and 2000 years harmonized to Census 2010 tract boundaries and American Community Survey (ACS) 5-year estimates for 2010—2014 (hereafter, 2010) for census tracts. We exclude census tracts with fewer than 50 residents or housing units in either year and we examine neighborhood changes over each decade, 1990—2000 and 2000—2010.

We consider tracts to be eligible to gentrify, i.e., *gentrifiable*, if they were in the primary central city and were previously relatively low-income neighborhoods such that they could undergo the revitalization that characterizes gentrification.[3] We operationalize central city tracts as gentrifiable using a dummy variable indicating if they had a median household income below the citywide median household income at the beginning of the period.[4] We consider a tract to be *gentrifying* if it experienced a percentage increase above the citywide median increase in either its median gross rent or median home value *and* an increase above the citywide median increase in its share of college-educated residents or its median household income.

We include shifts in both housing prices and characteristics of the area's residents because identifying neighborhoods with housing price spillovers that do not also have demographic changes as

[2] While some scholars document similar transformations occurring in rural towns or suburbs or as citywide phenomena (e.g., Brown-Saracino 2009), we focus on changes within the central cities of metropolitan areas given that the theoretical motivation of including gentrification in our analysis is the shift in the segregation of groups due to the increasing return to the city.
[3] Thus, we do not include what some scholars have described as "super-gentrification," where already wealthy areas undergo more socioeconomic upgrading (Brown-Saracino 2017).
[4] The extent of gentrification in metropolitan areas using measures using the metropolitan-wide median household income as the threshold have a correlation with the measures presented > .91 for both periods. Using other indicators besides income — such as education levels and rent or home values — as thresholds often exclude downtown and university areas where gentrification is often cited as prevalent.

gentrifying (Waldorf 1991). We include either changes in housing values or rents because both measures can reflect shifts in various amenities and investment in a neighborhood, but shifts in one dimension may not occur in step with the other. Further, we include either shifts in the educational status of the population or the median household income of residents over 25 years old because the influx of middle- and upper-class residents may be reflected in income or educational levels, particularly for young professionals often associated with gentrification such as artists, nonprofit workers, and younger workers with lower paying jobs (Ley 1996). Education status also better captures the influx of new residents rather than incumbent upward mobility (Freeman 2005). For each metropolitan area, we calculate the proportion of gentrifiable tracts that were gentrifying from 1990 to 2000 and from 2000 to 2010.

Control Variables

We include several control variables in our models to account for baseline differences in socioeconomic and ecological factors across metropolitan areas in 1990 and 2000 that may affect the degree to which the segregation of various groups changes over time. We control for the baseline composition and the overall socioeconomic status of metropolitan areas, which may affect the degree to which race and class groups are segregated, by including the following variables: logged median household income, percent of the civilian labor force that is unemployed, percent foreign-born, percent non-Hispanic black, percent Hispanic, and percent Asian. We also include ecological variables that indicate the age and the functional specializations of the metropolitan areas: logged population size, percent over 65 years old, percent employed in the manufacturing sector, percent of the labor force active in the military, and percent employed in government jobs. Table 1 presents descriptive statistics of the independent variables of our analysis.

[Table 1 about here.]

Results

The Changing Structure of Segregation

In Table 2, we present descriptive results of 2010 segregation levels for each group pairing by income, race, and race by income. We include overall *D*, macro-D, and micro-*D* in each of the tables, as well as micro-*D* within cities and micro-*D* within suburbs.[5] The results for income segregation show that overall segregation levels on average are higher between the affluent and non-affluent than between the poor and nonpoor. For both group pairings, micro-*D* accounts for most of the overall segregation, indicating that income segregation occurs primarily within the cities and suburbs of these metros, rather than between these subareas. Segregation between the affluent and non-affluent residents tends to be highest within suburbs, and segregation between the poor and nonpoor tends to be highest in cities. The results for racial segregation show that overall segregation levels on average are highest between white and black residents, followed by white and Hispanic, and white and Asian. For all of the group pairings, micro-*D* is the primary source of overall segregation, especially micro-*D* in central cities. This pattern is most pronounced for white-black segregation.

The results for the race by income groups indicate that overall segregation levels on average are highest between affluent whites and the non-affluent, and segregation between poor blacks and the nonpoor is also relatively high but has the largest standard deviation as well. Further, segregation levels are lowest between poor Asians and nonpoor residents, and levels are only slightly higher between poor whites and nonpoor residents. The segregation level between poor Hispanics and nonpoor residents is in the middle of these groups. There is also little variation for the overall segregation levels of poor Asians and poor whites from nonpoor residents, in contrast to poor Hispanics, poor blacks, and affluent whites.

This ordering between group pairs is generally similar both within the suburbs and within cities. In the suburbs, however, the segregation of affluent whites from non-affluent residents is almost double the degree of segregation of poor blacks from nonpoor residents. Further, the segregation levels of poor Hispanics and poor whites from nonpoor residents are similar, with poor whites also having relatively higher variance than the segregation of poor Asians from nonpoor residents. In central cities, the levels of

[5] Micro-D is the population weighted average of the segregation within each subarea, which are represented as "micro-*D* within cities" and "micro-*D* within suburbs."

segregation of poor residents of all race groups from nonpoor residents are higher than in the suburbs. In addition, the segregation of poor blacks from nonpoor blacks in central cities is greater than that of affluent whites from non-affluent residents, and the segregation of poor Hispanics is higher than the segregation of poor whites from nonpoor residents.

[Table 2 about here.]

Table 3 reports the average changes in segregation levels from 1990 to 2000 and from 2000 to 2010 for each group pairing for the overall *D*, macro-*D*, and micro-*D*, as well as micro-*D* within cities and micro-*D* within suburbs. The results for income segregation show that, after decreases in average overall segregation from 1990 to 2000, segregation increased from 2000 to 2010 (statistically significant at the $p<.05$ level) for both affluent residents and poor residents from nonaffluent and poor residents, respectively. The changes tended to occur for the micro-*D* component of segregation rather than macro-*D*, which remained steady over both periods. For racial segregation, changes in white-black segregation for both decades were not statistically significant at the $p<.05$ level. White-Hispanic and white-Asian segregation, on the other hand, increased during the 1990s, and most of these changes tended to occur for the micro-*D* component in both cities and suburbs. From 2000-2010, only white-Asian segregation in the suburbs increased ($p<.05$).

The results for race and income groups show that the segregation of poor blacks from non-poor residents decreased during the 1990s, and most of this change was due to declines in segregation in central cities. However, segregation levels of poor blacks increased during the 2000s in the suburbs. Conversely, segregation levels of poor Hispanics and poor Asians from nonpoor residents remained steady during the 1990s and increased during the 2000s, though to a lesser degree for poor Asians, with most of this change occurring for the micro-*D* component and both within cities and suburbs. For poor whites, segregation levels decreased across all components during the 1990s and increased slightly during the 2000s, with significant changes occurring within the suburbs only. There are no significant changes for the segregation of affluent whites from non-affluent residents.

[Table 3 about here.]

In Table 4, we present the components of segregation for the metropolitan areas with the highest levels of overall race by income segregation for each group pairing based on the 2010 overall *D* value. The table shows that the Detroit metropolitan area tops the list for segregation of both poor blacks and poor whites from all nonpoor residents. The overall segregation level of poor blacks from nonpoor residents in the Detroit metro area (24.27) is nearly 2.5 times the overall average (9.98) for the 100 largest metropolitan areas, and the overall segregation level of poor whites from nonpoor residents there (8.26) is over two times the overall average (3.85). Note that the second highest poor white-all nonpoor segregation level is substantially lower than Detroit's: 5.88. When we look at the components of the poor white-all nonpoor segregation for the top five metropolitan areas, there are notable differences in the geographic distribution of the segregation in Detroit compared to the other metro areas: While nearly all of the segregation is part of the micro-component for poor whites in the other metro areas, as well as for more of the metro areas, the micro-component only comprises 78.5% of the overall segregation. Further, the segregation of poor whites from nonpoor whites in the city of Detroit (10.08) is much higher than all of the other areas. By contrast, the segregation of poor blacks from nonpoor blacks within Detroit (7.38) is much lower than average (10.37) and much higher than average (5.46) within the suburbs of Detroit (12.74). The other metro areas with high poor black-all nonpoor segregation have more segregation of these groups in the central city instead. The remaining metro areas on the list for poor blacks are large, former manufacturing cities, while those for poor whites span both the Midwest and Florida. We suspect that this may reflect large retirement populations, as well as the legacy of former manufacturing cities.

Not surprisingly, the metropolitan areas with the highest levels of poor Hispanic-all nonpoor and poor Asian-all nonpoor segregation are destinations for immigrants from Latin American and Asian countries, respectively. In these metro areas, the degree to which the segregation is higher between subareas or within subareas varies widely. For example, the macro-component of poor Hispanic-all nonpoor segregation is much higher than average (10.13%) in the Providence metropolitan area (28.42%) but is much lower than average in the New York metropolitan area (2.22%). For poor Asian-all nonpoor segregation, the macro-component of segregation in San Francisco metropolitan area (22.77%) is nearly

three times the average (7.66%) but is nearly zero in the Los Angeles metropolitan area. Nonetheless, these metropolitan areas all have much higher than average levels of segregation for these groups within the central cities of the metropolitan areas, and most have higher levels of segregation for their respective groups within the suburbs.

Lastly, the table shows that the segregation of affluent whites from non-affluent residents is highest in the large east coast metro areas—Newark, Washington, and New York—and in large Texas metro areas—Dallas and Houston. The macro-component of Newark's segregation (29.07%) is much higher than the average for all 100 metro areas (10.55%), but the remaining metro areas on the list have lower than average macro-components of affluent white-non-affluent segregation. This pattern is evident with Newark's very low within-city segregation level (2.82), whereas the other metro areas have very high within-city segregation. Nonetheless, all metropolitan areas on the list have very high within-suburb segregation levels.

[Table 4 about here.]

Estimating Gentrification's Effect on Segregation

Next, we present results from multivariate regression analysis estimating segregation levels and changes in segregation levels in separate models. Table 5 shows the regression results for income segregation on the prevalence of gentrification across the metropolitan areas. The outcome measures are standardized to ease interpretation across outcomes because each type of segregation has differing distributions although they are on the same scale. Each type of segregation is modeled separately, and results are presented for models with the full set of controls and metropolitan area and period fixed effects. The first set of results in Table 5 predict segregation levels, and the second set of results predict changes in segregation levels controlling for baseline levels of segregation.

[Table 5 about here.]

The results in Model 1 predicting overall income segregation levels show a negative association with the prevalence of gentrification. The coefficient of -.01 indicates that a 10 percentage-point increase

in the prevalence of gentrification reduces overall income segregation levels by .1 standard deviations. This effect size is small, but it is nonetheless significant despite the extensive number of controls and fixed effects that are included in the models that also contribute to segregation levels. Further, the results in Model 2 predicting Macro-*D*, the degree to which segregation is between cities and suburbs rather than within, is also negative. This coefficient is even smaller (-.004) but is statistically significant, indicating that income segregation between cities and suburbs decreases on average with gentrification. These findings are consistent with our hypotheses that income segregation between cities and suburbs decreases with gentrification, as higher-income residents move to central cities and lower-income residents are displaced to the suburbs. However, the results are not significant when considering both segregation within the suburbs only and segregation within central cities only (Models 3 and 4). These findings suggest that income-mixing from gentrification may be occurring but may also be offset by the re-segregation of some residents resulting from displacement to other neighborhoods within central cities. At the same time, there may be income-mixing occurring in the suburbs as residents are displaced but a simultaneous process of re-segregation occurring in the suburbs as they diversify.

The results predicting changes in the overall income segregation levels are similar for overall segregation levels and Macro-*D*. A 10 percentage-point increase in the prevalence of gentrification is associated with a negative change in overall income segregation and Macro-*D* income segregation by .2 and .1 standard deviations, respectively. However, the results show a positive association between gentrification prevalence and changes in income segregation in the suburbs. The results are counter to our hypotheses that gentrification would decrease income segregation in the suburbs as low-income residents are displaced. Instead, gentrification may be displacing low-income residents to the suburbs but subsequently results in higher-income residents moving away or lower-income residents increasing their concentrations in the suburbs.

Additional control variables are also associated with segregation levels. For example, the share of foreign-born residents, the proportion of residents in the military, and the unemployment rate in metropolitan areas are negatively associated with Macro-*D* levels, while the share of the labor force in the

manufacturing sector is positively associated with it. However, segregation levels within the suburbs is positively associated with the military population and negatively associated with manufacturing and the percent of workers in the public sector. In models predicting segregation changes, the share of Hispanics, elderly residents, and the share of residents in the military are positively associated with segregation changes while the population size and unemployment rates are negatively associated with changes in overall income segregation. However, the relationships vary between city and suburb. For example, the share of public sector workers increases income segregation in the central cities but decreases it in the suburbs.

Gentrification is not statistically significant in models predicting racial segregation, race-income segregation, and race-tenure segregation with all pairs considered together when controls are included, and these results are not shown for brevity. When we consider group-specific changes in segregation, these null results can be explained by the fact that gentrification is associated with the segregation of groups in distinct ways. Table 6 presents the coefficients for the prevalence of gentrification from separate fixed effects models predicting segregation levels and changes in segregation levels on gentrification for each group pairing for overall segregation and its various components.

[Table 6 about here.]

The results demonstrate several noteworthy associations between gentrification and segregation for different groups. First, gentrification is negatively associated with overall segregation levels and changes in segregation levels for both affluent residents from non-affluent residents and poor residents from nonpoor residents. This is consistent with the findings presented in Table 5. By separately examining group pairs, the results in Table 6 also reveal that gentrification is positively associated with the segregation of poor residents from nonpoor residents within cities. Thus, while gentrification may be associated with lower levels of income segregation overall, it differentially affects poor and affluent residents within central cities. It does not affect levels of segregation between affluent and non-affluent residents, which does not support claims that cities are increasingly concentrating the very wealthy; however, gentrification does appear to be associated with higher levels of concentration of poor residents

from nonpoor residents, reflecting patterns of displacement. For changes in segregation levels, however, the positive relationship between gentrification and changes in segregation within cities is not statistically significant. Moreover, gentrification is positively associated with changes in suburban segregation between affluent and non-affluent residents. This supports an increasing concentration of wealthy residents in the suburbs as they diversify with gentrification's spread.

Next, our assessment of the segregation of poor residents of specific racial and ethnic groups from nonpoor residents suggest that these patterns for poor residents differ across racial and ethnic groups. The results show that gentrification is negatively associated with overall segregation levels and changes in overall segregation levels for poor whites and poor blacks. However, when we examine segregation levels for these groups within central cities, gentrification is negatively associated with segregation and its changes for poor whites but is positively associated with segregation and its changes for poor blacks. In addition, gentrification is negatively associated with segregation levels and changes in them for poor Hispanics within central cities. These findings can result from two potential processes. First, gentrification may occur more often in neighborhoods that are disproportionately comprised of poor white and Hispanic residents and may continue to avoid predominantly black neighborhoods. This contrasts popular depictions of gentrification occurring in minority neighborhoods but is also consistent with recent empirical research highlighting the stability of poor black neighborhoods (Brown-Saracino 2017). However, this would not fully explain the findings for the changes in the segregation levels of poor blacks from nonpoor residents. Gentrification may certainly be occurring in some neighborhoods with poor blacks, but the results suggest that blacks may disproportionately experience displacement and experience a re-concentration within central cities.

In addition to the increased segregation of poor blacks in central cities, gentrification is positively associated with the changes in the segregation levels of affluent whites in central cities. While we did not find a relationship with increases in segregation for all affluent residents, gentrification increases then segregation of affluent whites. Thus, gentrification may not affect the segregation of affluent residents on average, but we suspect that these results may reflect an increasing concentration of affluent whites as

middle-class and poor residents became increasingly integrated with the spread of gentrification over the decade, leaving exclusive pockets of central cities reserved for wealthy whites. Alternatively, displacement may be more rampant in neighborhoods they gentrify relative to affluent residents of different racial and ethnic groups.

When considering the suburbs and the degree to which segregation is between cities and suburbs, gentrification is negatively associated with the segregation of poor whites in the suburbs and changes in the Macro-*D* of poor blacks. Thus, gentrification may be displacing poor whites to the suburbs, resulting in segregation declines for this population. The negative relationship between gentrification and changes in the degree of segregation between cities and suburbs for poor blacks suggests that gentrification may also be displacing residents to the suburbs but not necessarily changing the degree of their segregation within suburbs.

We also considered the segregation of minority groups from whites, as well as whether this differs for minority renters and owners. We do not find a relationship between gentrification and segregation for most racial pairs and segregation types, with the exception of a positive relationship between Black-white segregation levels and changes within central cities, as well as overall Hispanic-white segregation levels. The results for black-white segregation further support the notion that gentrification may be disproportionately displacing black residents within cities, while the Hispanic-white findings suggest that gentrification may be displacing Hispanic residents more broadly. This is further supported by the results based on tenure status. The results show that, within central cities, gentrification is positively associated with changes in segregation levels of both black renters and owners from whites (as well as overall segregation levels for black renters), while it is positively associated with changes in segregation levels for Hispanic renters in the suburbs (as well as overall segregation levels and changes). Thus, gentrification appears to be associated with the displacement, either directly or indirectly, of Hispanic renters to the suburbs while displacing blacks within central cities.

Discussion and Conclusions

This study updates our understanding of contemporary segregation across large metropolitan areas in the US and contributes to the scholarship on the changing ecology of segregation by race and class. We argued that recent trends in the spatial structure of race and class within metropolitan areas and the race and class structure of the U.S. more generally call for examining the component parts of metropolitan segregation and for examining the segregation of specific groups marked by both race and class. To do this, we draw on a recently developed measure of segregation—Roberto's (2016) Divergence Index—which allows us to examine the component parts of segregation while also capturing evenness, to examine how the prevalence of gentrification contributes to restructuring segregation across the 100 largest metropolitan areas.

Our findings reveal several trends. First, we show that, as expected, gentrification is associated with declines in income segregation. However, when we examine income segregation by specific group pairs and the component parts of segregation, we find that gentrification is also associated with the increasing concentration of affluent residents in the suburbs and higher levels of segregation of poor residents in central cities. Second, when we distinguish race groups by socioeconomic status, gentrification is associated with lower levels of segregation for poor whites and poor Hispanics in central cities but higher levels of segregation for poor blacks, which suggests that gentrification may be either more prevalent in non-black neighborhoods or may be more likely to displace and reconcentrate poor blacks. Both potential processes suggest that the consequences of gentrification are disproportionately negative for disadvantaged black residents in cities. At the same time, gentrification is associated with increases in the segregation of affluent whites within cities, which further suggests that displacement, either direct or indirect, is occurring in urban neighborhoods to which affluent whites are concentrating. Third, our findings for racial segregation and by tenure status for racial and ethnic groups further suggest that gentrification may be disproportionately affecting black residents within central cities. We find that gentrification is associated with increases in segregation in central cities for both black owners and renters from whites. Altogether the results suggest that gentrification may be integrating some residents along socioeconomic dimensions, but it is simultaneously segregating black residents and affluent whites within

central cities.

[To be continued.]

References

Atkinson, Rowland. 2004. “The Evidence on the Impact of Gentrification: New Lessons for the Urban Renaissance?” *European Journal of Housing Policy* 4(1):107–31.

Barton, Michael. 2016. “An Exploration of the Importance of the Strategy Used to Identify Gentrification.” *Urban Studies* 53(1):92–111.

Baum-Snow, N. and D. Hartley. 2016. “Accounting for Central Neighborhood Change, 1980-2010.” Chicago Federal Reserve Bank Working Paper Series No. 09-2016.

Bischoff, Kendra, and Sean F. Reardon. 2014. "Residential segregation by income, 1970-2009." In *Diversity and Disparities: America Enters a New Century.* New York: The Russell Sage Foundation.

Bostic, Raphael W. and Richard W. Martin. 2003. “Black home-owners as a gentrifying force? Neighbourhood dynamics in the context of minority home-ownership.” *Urban Studies 40*(12):2427-2449.

Brown-Saracino, Japonica. 2017. “Explicating Divided Approaches to Gentrification and Growing Income Inequality.” *Annual Reiew of Sociology* 43:515-39.

Brown-Saracino, Japonica. 2009. *A Neighborhood That Never Changes: Gentrification, Social Preservation, and the Search for Authenticity.* Chicago, IL: The University of Chicago Press.

Charles, Camille Zubrinsky. 2003. "The dynamics of racial residential segregation." *Annual review of sociology* 29(1): 167-207.

Cover, Thomas M., and Joy A. Thomas. 2006. *Elements of Information Theory*. Hoboken, N.J.: Wiley-Interscience.

Desmond, Matthew. 2016. *Evicted: Poverty and Profit in the American City*. New York: Broadway Books.

Ding, Lei, Jackelyn Hwang, and Eileen Divringi. 2016. “Gentrification and Residential Mobility in Philadelphia.” *Regional Science and Urban Economics* 61:38–51.

Ellen, Ingrid Gould, Keren Mertens Horn, and Davin Reed. 2016. "Has Falling Crime Invited Gentrification?." NYU *Furman Center Working Paper*. Available online: http://furmancenter.org/files/NYUFurmanCenter_WhitePaper_FallingCrimeGentrification_18OCT2016.pdf.

Ellen, Ingrid Gould, and Katherine M. O'Regan. 2011. “How Low Income Neighborhoods Change: Entry, Exit, and Enhancement.” *Regional Science and Urban Economics*, 41(2): 89–97.

Fischer, Mary J. 2008. "Shifting Geographies Examining the Role of Suburbanization in Blacks' Declining Segregation." *Urban Affairs Review* 43(4): 475-496.

Freeman, Lance. 2005. “Displacement or Succession? Residential Mobility in Gentrifying Neighborhoods.” *Urban Affairs Review* 40(4):463–91.

Freeman, Lance. 2009. “Neighbourhood Diversity, Metropolitan Segregation, and Gentrification: What Are The Links in the US?” *Urban Studies* 46(10):2079-2101.

Freeman, L. and Cai, T., 2015. “White Entry into Black Neighborhoods Advent of a New Era?” *The ANNALS of the American Academy of Political and Social Science 660*(1):302-318.

Glaeser, E. and Vigdor, J., 2012. *The End of the Segregated Century: Racial Separation in America's Neighborhoods, 1890-2010*. New York, NY: Manhattan Institute for Policy Research.

Goetz, Edward. 2011. “Gentrification in Black and White the Racial Impact of Public Housing Demolition in American Cities.” *Urban Studies* 48(8):1581-1604.

Hackworth, Jason, and Neil Smith. 2001. “The Changing State of Gentrification.” *Tijdschrift Voor Economische En Sociale Geografie* 92(4):464-477.

Howell, Aaron J., and Jeffrey M. Timberlake. 2014. "Racial and ethnic trends in the suburbanization of poverty in US metropolitan areas, 1980–2010." *Journal of Urban Affairs* 36(1): 79-98.

Hwang, Jackelyn. 2016. “Pioneers of Gentrification: Transformation in Global Neighborhoods in Urban America in the Late Twentieth Century.” *Demography* 53(1):189-213.

Hwang, Jackelyn, and Jeffrey Lin. 2016. "What Have We Learned About the Causes of Recent Gentrification?." *Cityscape: A Journal of Policy Development and Research* 18(3):9-26.

Hwang, Jackelyn, and Robert J. Sampson. 2014. “Divergent Pathways of Gentrification: Racial Inequality and the Social Order of Renewal in Chicago Neighborhoods.” *American Sociological Review* 79(4):726-51.

Hyra, Derek S. 2012. “Conceptualizing the New Urban Renewal: Comparing the Past to the Present.” *Urban Affairs Review* 48(4):498-527.

Hyra, Derek S. 2017. *Race, Class, and Politics in the Cappuccino City*. Chicago, IL: University of Chicago Press.

Iceland, John, and Rima Wilkes. 2006. "Does socioeconomic status matter? Race, class, and residential segregation." *Social Problems* 53(2): 248-273.

Kneebone, Elizabeth, and Alan Berube. 2013. *Confronting Suburban Poverty in America*. Washington, DC: Brookings Institution Press.

Kullback, Solomon. 1987. “Letters to the Editor.” *The American Statistician* 41:338–41.

Lee, Barrett A., Sean F. Reardon, Glenn Firebaugh, Chad R. Farrell, Stephen A. Matthews, and David O’Sullivan. 2008. “Beyond the Census Tract: Patterns and Determinants of Racial

Segregation at Multiple Geographic Scales." *American Sociological Review* 73(5):766–91.

Ley, David. 1996. *The New Middle Class and the Remaking of the Central City*. New York: Oxford University Press.

Lichter, Daniel T., Domenico Parisi, and Michael C. Taquino. 2015. "Toward a New Macro-Segregation? Decomposing Segregation Within and Between Metropolitan Cities and Suburbs." *American Sociological Review* 80(4):843–73.

Logan, John R., Andrew Foster, Jun Ke, and Fan Li. 2018. "The Uptick in Income Segregation: Real Trend or Random Sampling Variation?" *American Journal of Sociology 124*(1):185-222.

Logan, John R. and Brian J. Stults. 2011. "The Persistence of Segregation in the Metropolis: New Findings from the 2010 Census." *Census Brief prepared for Project US2010*.

Logan, John R., Zengwang Xu, and Brian J. Stults. 2014. "Interpolating US Decennial Census Tract Data from as Early as 1970 to 2010: A Longitudinal Tract Database" *The Professional Geographer* 66(3): 412–420.

Massey, Douglas S. 2007. *Categorically unequal: The American stratification system*. New York: Russell Sage Foundation.

Massey, Douglas S. 2016. "Residential segregation is the linchpin of racial stratification." *City & Community* 15(1): 4-7.

Massey, Douglas S., and Nancy A. Denton. 1993. *American apartheid: Segregation and the making of the underclass*. Cambridge, MA: Harvard University Press.

Massey, Douglas S., Jonathan Rothwell, and Thurston Domina. 2009. "The changing bases of segregation in the United States." *The Annals of the American Academy of Political and*

Social Science 626(1): 74-90.

McKinnish, Terra, Randall Walsh, and T. Kirk White. 2010. “Who Gentrifies Low-Income Neighborhoods?” *Journal of Urban Economics* 67(2):180–93.

Newman, Kathe, and Elvin K. Wyly. 2006. “The Right to Stay Put, Revisited: Gentrification and Resistance to Displacement in New York City.” *Urban Studies* 43(1):23–57.

Owens, Ann. 2012. “Neighborhoods on the Rise: A Typology of Neighborhoods Experiencing Socioeconomic Ascent.” *City & Community* 11(4):345–69.

Owens, Ann and Jennifer Candipan. 2018. “Racial/Ethnic Transition and Hierarchy Among Ascending Neighborhoods.” *Urban Affairs Review*, doi: p.1078087418770810.

Parisi, Domenico, Daniel T. Lichter, and Michael C. Taquino. 2011. "Multi-scale residential segregation: Black exceptionalism and America's changing color line." *Social Forces* 89.3: 829-852.

Pattillo, Mary. 2007. *Black on the Block: The Politics of Race and Class in the City*. Chicago, IL: The University of Chicago Press.

Pettigrew, Thomas F. 1979. "Racial change and social policy." *The Annals of the American Academy of Political and Social Science* 441(1):114-131.

Quillian, Lincoln, 1999. “Migration Patterns and the Growth of High-Poverty Neighborhoods, 1970--1990”. *American Journal of Sociology105*(1):1-37.

Reardon, Sean F., and Kendra Bischoff. 2011. "Income Inequality and Income Segregation 1." *American Journal of Sociology* 116(4): 1092-1153.

Reardon, Sean F., Chad R. Farrell, Stephen A. Matthews, David O’Sullivan, Kendra Bischoff, and Glenn Firebaugh. 2009. "Race and space in the 1990s: Changes in the geographic scale of racial residential segregation, 1990–2000." *Social Science Research* 38(1): 55-

70.

Reardon, Sean F., Stephen A. Matthews, David O'Sullivan, Barrett A. Lee, Glenn Firebaugh, Chad R. Farrell, and Kendra Bischoff. 2008. "The Geographic Scale of Metropolitan Racial Segregation." *Demography* 45(3):489–514.

Roberto, Elizabeth. 2016. "The Divergence Index: A Decomposable Measure of Segregation and Inequality." Working Paper: arXiv:1508.01167.

Rugh, Jacob S. and Douglas S. Massey. 2014. "Segregation in Post-Civil Rights America." *Du Bois Review: Social Science Research on Race* 11(2):205-232.

Sharkey, Patrick. 2018. *Uneasy Peace: The Great Crime Decline, the Renewal of City Life, and the Next War on Violence*. New York: WW Norton & Company.

Smith, Neil. 1996. *The New Urban Frontier: Gentrification and the Revanchist City*. London: Routledge.

Tach, Laura, and Allison Dwyer Emory. 2017. "Public Housing Redevelopment, Neighborhood Change, and the Restructuring of Urban Inequality." *American Journal of Sociology* 123(3):686-739.

Waldorf, Brigitte S. 1991. "A Spatial Analysis of Rent Shifts in the Chicago Rental Housing Market, 1970-1980." *Urban Geography* 12(5):450-468.

Wyly, E.K. and Hammel, D.J., 2004. "Gentrification, segregation, and discrimination in the American urban system." *Environment and Planning A 36*(7):1215-1241.

Tables

Table 1. Descriptive Statistics of Independent Variables (N = 100)

	Mean	SD	Min	Max
% of gentrifiable tracts gentrifying from 1990-2000	28.48	19.18	0.00	68.97
% of gentrifiable tracts gentrifying from 2000-2010	26.78	13.17	3.03	62.50
% non-Hispanic black, 1990	12.08	9.12	0.14	41.01
% non-Hispanic black, 2000	12.70	9.56	0.34	43.35
% Hispanic, 1990	9.66	14.31	0.43	85.25
% Hispanic, 2000	13.01	15.97	0.72	88.35
% Asian, 1990	3.21	6.60	0.22	59.80
% Asian, 2000	4.16	6.53	0.46	53.75
Population (logged), 1990	13.93	0.68	12.86	16.16
Population (logged), 2000	14.07	0.68	13.13	16.24
% foreign-born, 1990	7.89	7.77	1.00	45.15
% foreign-born, 2000	11.05	9.24	2.01	50.94
% over age 65, 1990	12.02	3.37	7.42	30.40
% over age 65, 2000	12.02	3.07	7.25	28.52
Median household income (logged), 1990 ($)	10.68	0.18	10.03	11.17
Median household income (logged), 2000 ($)	10.71	0.17	10.12	11.21
% military population, 1990	1.75	3.36	0.09	19.03
% military population, 2000	0.89	1.85	0.03	11.22
% unemployed, 1990	6.46	2.10	2.82	16.73
% unemployed, 2000	5.51	1.69	3.13	12.04
% manufacturing, 1990	18.14	6.09	5.18	33.20
% manufacturing, 2000	13.16	5.07	3.68	27.11
% government employees, 1990	16.67	5.26	9.65	32.58
% government employees, 2000	14.40	3.81	8.50	24.57

Note: Logged dollar values are based on values adjusted to the year 2000.

Table 2. Descriptive Statistics of Two-Group Metropolitan Segregation Measures for Income, Race, and Race by Income Groups, 2010

Income and Racial Segregation	Mean	SD	Min	Max
Affluent-Nonaffluent				
Overall-D	9.5	2.1	4.2	15.3
Macro-D	1.0	1.1	0.0	5.0
Micro-D	8.5	2.0	3.8	13.9
Micro-D in Cities	8.0	3.2	0.9	15.2
Micro-D in Suburbs	8.4	2.2	3.8	13.5
Poor-Nonpoor				
Overall-D	6.9	1.5	3.5	11.4
Macro-D	1.2	1.1	0.0	5.0
Micro-D	5.7	1.2	3.4	8.8
Micro-D in Cities	7.2	2.1	0.8	13.1
Micro-D in Suburbs	4.9	1.2	2.0	7.3
White-Black				
Overall-D	21.2	13.6	1.3	62.1
Macro-D	5.4	6.5	0.0	45.0
Micro-D	15.9	10.9	1.1	52.5
Micro-D in Cities	24.3	16.1	0.6	67.9
Micro-D in Suburbs	12.4	10.1	0.8	52.0
White-Hispanic				
Overall-D	12.9	8.8	0.6	39.4
Macro-D	2.2	3.0	0.0	13.8
Micro-D	10.7	7.9	0.4	38.1
Micro-D in Cities	15.1	10.4	0.3	42.8
Micro-D in Suburbs	9.3	7.9	0.2	36.0
White-Asian				
Overall-D	5.3	5.0	0.5	22.5
Macro-D	0.5	0.8	0.0	6.5
Micro-D	4.8	4.7	0.5	22.1
Micro-D in Cities	6.1	6.0	0.1	26.0
Micro-D in Suburbs	4.5	4.7	0.4	24.8

Race by Income Segregation	Mean	SD	Min	Max
Poor Black - All Non-poor				
Overall-D	9.1	5.3	0.8	24.8
Macro-D	2.6	2.9	0.0	15.4
Micro-D	6.5	3.5	0.7	14.3
Micro-D in Cities	10.4	6.0	0.5	22.1
Micro-D in Suburbs	4.8	3.2	0.5	12.8
Poor Hispanic - All Non-poor				
Overall-D	5.0	3.0	1.0	16.5
Macro-D	0.7	1.1	0.0	5.1
Micro-D	4.3	2.5	1.0	11.4
Micro-D in Cities	6.0	3.5	0.1	17.1
Micro-D in Suburbs	3.6	2.3	0.8	11.5
Poor Asian - All Non-poor				
Overall-D	1.7	1.1	0.6	6.4
Macro-D	0.2	0.3	0.0	1.6
Micro-D	1.5	0.9	0.6	4.9
Micro-D in Cities	2.5	1.6	0.4	8.4
Micro-D in Suburbs	1.1	0.6	0.2	4.1
Poor White - All Non-poor				
Overall-D	3.7	1.0	1.8	7.4
Macro-D	0.1	0.2	0.0	1.1
Micro-D	3.6	0.9	1.8	6.3
Micro-D in Cities	4.1	1.8	1.0	10.1
Micro-D in Suburbs	3.3	1.1	1.6	8.1
Affluent White - All Non-affluent				
Overall-D	10.8	3.3	3.3	22.6
Macro-D	1.3	1.5	0.0	6.9
Micro-D	9.5	3.0	2.8	19.3
Micro-D in Cities	9.5	4.3	0.8	21.5
Micro-D in Suburbs	9.2	3.1	2.4	19.3

Note: N =100.

Table 3. Mean Two-Group Metropolitan Segregation and Decomposition for Income, Race, and Race by Income Groups, 2010 and Change for 2000-2010 and 1990-2000 (N = 100)

Income and Racial Segregation	Change 1990-2000	Change 2000-2010	Race by Income Segregation	Change 1990-2000	Change 2000-2010
Affluent-Nonaffluent			Poor Black - All Non-poor		
Overall-D	-0.1*	0.8*	Overall-D	-1.8*	1.1
Macro-D	0.0	0.0	Macro-D	-0.3	0.2
Micro-D	-0.1*	0.8*	Micro-D	-1.5*	0.9
Micro-D in Cities	-0.6*	1.3*	Micro-D in Cities	-3.0*	0.5
Micro-D in Suburbs	0.1*	0.7*	Micro-D in Suburbs	-0.5	1.2*
Poor-Nonpoor			Poor Hispanic - All Non-poor		
Overall-D	-0.9	0.8*	Overall-D	0.3	1.7*
Macro-D	0.0	0.0	Macro-D	0.1	0.2
Micro-D	-0.9	0.7*	Micro-D	0.2	1.6*
Micro-D in Cities	-1.3	0.7*	Micro-D in Cities	0.1	1.8*
Micro-D in Suburbs	-0.6	0.8*	Micro-D in Suburbs	0.3	1.5*
White-Black			Poor Asian - All Non-poor		
Overall-D	0.1	-1.2	Overall-D	0.1	0.5*
Macro-D	0.3	-0.8	Macro-D	0.0	0.0
Micro-D	-0.3	-0.5	Micro-D	0.0	0.5*
Micro-D in Cities	-2.5	-2.8	Micro-D in Cities	0.1	0.7*
Micro-D in Suburbs	1.3	0.8	Micro-D in Suburbs	0.1	0.4*
White-Hispanic			Poor White - All Non-poor		
Overall-D	3.1*	1.9	Overall-D	-1.1*	0.3*
Macro-D	0.6	0.2	Macro-D	-0.1*	0.0
Micro-D	2.5*	1.7	Micro-D	-1.0*	0.4*
Micro-D in Cities	3.1*	1.5	Micro-D in Cities	-1.3*	0.1
Micro-D in Suburbs	2.5*	1.9	Micro-D in Suburbs	-0.7*	0.5*
White-Asian			Affluent White - All Non-affluent		
Overall-D	1.3*	1.2	Overall-D	0.5	0.0
Macro-D	0.1	0.0	Macro-D	0.1	-0.2
Micro-D	1.2*	1.2	Micro-D	0.4	0.3
Micro-D in Cities	1.6*	0.7	Micro-D in Cities	-0.1	0.3
Micro-D in Suburbs	1.3*	1.4*	Micro-D in Suburbs	0.6	0.4

Note: *p<.05

Table 4. Two-Group Metropolitan Segregation and Decomposition for Top-5 Most Segregated Metropolitan Areas by Race and Class,

Metropolitan Area/Division	Overall *D*	Total Macro-*D* as Percent of Overall *D*	Total Micro-*D* as Percent of Overall *D*	Suburban Micro-*D*	City Micro-*D*
Poor Black - All Non-poor					
Detroit-Livonia-Dearborn, MI	24.27	58.30	41.70	12.74	7.38
Cleveland-Elyria-Mentor, OH	22.00	38.28	61.72	11.93	19.43
Memphis, TN-MS-AR	19.48	24.78	75.22	10.94	16.87
Philadelphia, PA	19.00	24.59	75.41	8.37	18.05
Buffalo-Niagara Falls, NY	18.83	41.97	58.03	7.28	17.50
Average	9.98	20.54	79.46	5.46	10.37
Poor Hispanic - All Non-poor					
New York-White Plains-Wayne, NY-NJ	11.29	2.22	97.78	8.45	11.95
San Antonio, TX	11.16	12.65	87.35	6.00	10.85
Providence-New Bedford-Fall River, RI-MA	10.68	28.42	71.58	6.98	11.05
Phoenix-Mesa-Scottsdale, AZ	10.63	8.98	91.02	7.27	13.48
Philadelphia, PA	10.12	13.33	86.67	2.83	13.08
Average	5.49	10.13	89.87	3.88	5.97
Poor Asian - All Non-poor					
San Francisco-San Mateo-Redwood City, CA	6.22	22.77	77.23	2.06	7.76
Boston-Quincy, MA	5.19	13.49	86.51	2.39	7.32
Los Angeles-Long Beach-Glendale, CA	4.77	0.77	99.23	4.07	5.75
New York-White Plains-Wayne, NY-NJ	4.50	6.33	93.67	2.26	4.93
Sacramento--Arden-Arcade--Roseville, CA	3.86	12.83	87.17	3.08	4.31
Average	1.90	7.66	92.34	1.24	2.49
Poor White - All Non-poor					
Detroit-Livonia-Dearborn, MI	8.26	21.47	78.53	4.69	10.08
Fort Lauderdale-Pompano Beach-Deerfield Beach, FI	5.88	0.27	99.73	6.30	2.32
Columbus, OH	5.85	0.07	99.93	5.88	5.81
Indianapolis-Carmel, IN	5.53	1.99	98.01	4.87	5.87
Tampa-St. Petersburg-Clearwater, FL	5.19	3.31	96.69	5.25	3.31
Average	3.85	3.08	96.92	3.46	4.12
Affluent White - All Non-affluent					
Newark-Union, NJ-PA	25.08	29.07	70.93	22.79	2.82
Washington-Arlington-Alexandria, DC-VA-MD-WV	20.65	1.63	98.37	20.01	21.52
New York-White Plains-Wayne, NY-NJ	18.51	4.77	95.23	17.47	17.67
Houston-Sugar Land-Baytown, TX	17.87	5.23	94.77	15.08	18.34
Dallas-Plano-Irving, TX	17.07	5.84	94.16	14.74	18.68
Average	10.93	10.55	89.45	9.49	9.51

Table 5: Regression Results of Standardized Income Segregation Levels and Changes on the Prevalence of Gentrification

	Segregation Level				Segregation Change			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	Total D	Macro-D	Micro-D in Cities	Micro-D in Suburbs	Total D	Macro-D	Micro-D in Cities	Micro-D in Suburbs
Constant	19.65	9.07	-22.88	-2.16	7.68	62.42	-41.03	-8.36
	(17.51)	(10.04)	(15.98)	(8.07)	(19.90)	(18.42)***	(17.65)**	(12.87)
Gentrification	-0.01	-0.004	0.004	0.001	-0.02	-0.01	0.002	0.01
	(0.003)**	(0.002)*	(0.00)	(0.00)	(0.004)***	(0.004)***	(0.00)	(0.002)**
2000-2010 Period (Ref: 1990-2000)	0.69	0.71	-0.67	-0.47	0.03	2.09	-0.73	-0.73
	(0.70)	(0.40)*	(0.64)	(0.32)	(0.80)	(0.74)***	(0.71)	(0.52)
Affluent-nonaffluent (Ref: Poor-nonpoor)	1.13	-0.55	-0.51	0.6	0.77	-0.27	0.22	0.27
	(0.06)***	(0.05)***	(0.08)***	(0.04)***	(0.09)***	(0.06)***	(0.06)***	(0.08)***
Baseline segregation						0.47	0.45	0.83
						(0.05)***	(0.05)***	(0.04)***
% Black	0.01	0.002	0.04	0.002	-0.42	-0.46	-0.27	-0.25
	(0.06)	(0.04)	(0.06)	(0.03)	(0.06)***	(0.10)***	(0.05)***	(0.05)***
% Hispanic	0.03	-0.004	0.02	0.02	0.06	0.05	0.18	-0.08
	(0.04)	(0.02)	(0.04)	(0.02)	(0.07)	(0.06)	(0.06)***	(0.05)*
% Asian	0.03	0.02	0.02	-0.03	0.08	-0.02	0.05	-0.004
	(0.06)	(0.03)	(0.05)	(0.03)	(0.05)*	(0.04)	(0.04)	(0.03)
Population (logged)	-0.14	0.34	-0.57	-0.08	-0.01	0.1	0.04	-0.09
	(1.03)	(0.59)	(0.93)	(0.47)	(0.07)	(0.06)	(0.06)	(0.04)**
% Foreign-born	-0.02	-0.05	-0.002	0.01	-2.4	-0.07	-0.64	0.37
	(0.05)	(0.03)*	(0.05)	(0.02)	(1.17)**	(1.09)	(1.04)	(0.76)
% over age 65	-0.03	-0.01	0.08	-0.01	0.02	-0.06	0.01	0.02
	(0.09)	(0.05)	(0.08)	(0.04)	(0.06)	(0.05)	(0.05)	(0.04)
Median household income (logged)	-1.62	-1.29	2.67	0.44	0.27	-0.19	0.22	-0.07
	(1.91)	(1.10)	(1.74)	(0.88)	(0.10)**	(0.10)*	(0.09)**	(0.07)
% Military Population	0.05	-0.07	-0.02	0.07	2.16	-5.87	4.08	0.75
	(0.07)	(0.04)*	(0.06)	(0.03)**	(2.18)	(2.02)***	(1.93)**	(1.41)
% Unemployed	-0.04	-0.06	0.04	0.03	0.18	-0.23	0.01	0.14
	(0.05)	(0.03)**	(0.05)	(0.02)	(0.08)**	(0.07)***	(0.07)	(0.05)***
% Manufacturing	-0.02	0.06	-0.01	-0.05	-0.11	-0.18	0.09	0.1
	(0.04)	(0.02)***	(0.03)	(0.02)***	(0.06)*	(0.06)***	(0.05)	(0.04)**
% Government Employees	-0.01	0.04	0.07	-0.07	-0.03	0.11	-0.02	-0.08
	(0.05)	(0.03)	(0.05)	(0.02)***	(0.04)	(0.04)***	(0.04)	(0.03)***
Total segregation		0.33	0.62	0.72	-0.050	0.12	0.12	-0.14
		(0.03)***	(0.05)***	(0.03)***	-0.060	(0.06)**	(0.05)**	(0.04)***
R-squared	0.77	0.93	0.81	0.95	0.71	0.75	0.77	0.88
Adjusted R-squared	0.68	0.90	0.74	0.93	0.59	0.65	0.68	0.83
Residual Std. Error	1.26	0.35	1.40	0.64	0.73	0.24	0.89	0.43
F-Statistic	8.61***	31.18***	10.82***	49.58***	6.03***	7.38***	8.34***	17.77***

Note: *N*= 398; ***p < .001; **p<.01; *p<.05.

Table 6. Coefficients for Gentrification Prevalence in Models Predicting Standardized Segregation Levels and Change by Group Pairs and Segregation Types

	Segregation Level	Segregation Change
Income Segregation		
Affluent-Nonaffluent		
Overall-D	-0.004**	-0.010**
Macro-D	-0.003	-0.010
Micro-D in Cities	0.003	0.003
Micro-D in Suburbs	0.001	0.010*
Poor-Nonpoor		
Overall-D	-0.010***	-0.020***
Macro-D	-0.001	-0.010
Micro-D in Cities	0.010*	0.004
Micro-D in Suburbs	-0.002	-0.0003
Racial Segregation		
White-Black		
Overall-D	0.001	0.003
Macro-D	-0.0004	0.005
Micro-D in Cities	0.002**	0.010**
Micro-D in Suburbs	-0.001	-0.010
White-Hispanic		
Overall-D	0.002*	0.005
Macro-D	-0.0001	0.001
Micro-D in Cities	-0.001	0.0001
Micro-D in Suburbs	0.001	0.003
White-Asian		
Overall-D	0.0001	-0.002
Macro-D	-0.001	-0.003
Micro-D in Cities	-0.00004	0.002
Micro-D in Suburbs	0.0003	0.002
Income Segregation by Race		
White Poor-All Nonpoor		
Overall-D	-0.010***	-0.010***
Macro-D	0.0030	-0.002
Micro-D in Cities	-0.010***	-0.010***
Micro-D in Suburbs	-0.0004	-0.010**
Black Poor-All Nonpoor		
Overall-D	-0.010***	-0.010***
Macro-D	-0.002	0.001
Micro-D in Cities	0.003*	-0.004
Micro-D in Suburbs	-0.002	0.002
Hispanic Poor-All Nonpoor		
Overall-D	0.001	0.002
Macro-D	0.001	-0.010*
Micro-D in Cities	-0.003*	0.003
Micro-D in Suburbs	0.0005	-0.002
Asian Poor-All Nonpoor		
Overall-D	-0.001	-0.002
Macro-D	-0.002	-0.010
Micro-D in Cities	-0.001	-0.002
Micro-D in Suburbs	0.002	0.004
White Affluent-All Nonaffluent		
Overall-D	0.001	0.002
Macro-D	0.001	0.005
Micro-D in Cities	0.002	0.010*
Micro-D in Suburbs	-0.0002	0.003
Renter Racial Segregation		
Black Renters-All Whites		
Overall-D	-0.0004	-0.001
Macro-D	-0.0002	0.0001
Micro-D in Cities	0.002**	0.010**
Micro-D in Suburbs	-0.001	-0.003
Hispanic Renters-All Whites		
Overall-D	0.002**	0.004**
Macro-D	0.0001	0.002
Micro-D in Cities	-0.00002	0.002
Micro-D in Suburbs	0.001	0.003*
Asian Renters-All Whites		
Overall-D	-0.0001	-0.0001
Macro-D	0.0001	0.001
Micro-D in Cities	0.0001	0.0005
Micro-D in Suburbs	-0.0001	-0.001
Homeowner Racial Segregation		
Black Owners-All Whites		
Overall-D	0.020***	0.010***
Macro-D	-0.00005	0.004
Micro-D in Cities	0.001	0.010*
Micro-D in Suburbs	-0.0004	-0.001
Hispanic Owners-All Whites		
Overall-D	0.001	0.002
Macro-D	0.001	0.003
Micro-D in Cities	0.00030	0.001
Micro-D in Suburbs	0.00005	0.001
Asian Owners-All Whites		
Overall-D	0.000	-0.0003
Macro-D	-0.002	-0.003
Micro-D in Cities	-0.002	-0.002
Micro-D in Suburbs	0.001	0.002

Note: *N=199;* ***p < .001; **p<.01; *p<.05.