Segregation in Suburbia: The Changing Structure of Racial and Ethnic Segregation in U.S. Metropolitan Areas

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Abstract

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This dissertation investigates how rising suburbanization across race, ethnicity and socioeconomic status has interacted with the locations and depth of racial and ethnic inequalities in exposure to disadvantaged neighborhoods. In an attempt to understand the structure of differentiation among suburbs, this dissertation moves beyond the urban/suburban dichotomy to understanding space in metropolitan areas and contributes a novel indicator of whether a neighborhood is located in a city, older suburb, newer suburb or rural/exurb part of a given metropolitan area.

Chapter 2 assesses how trends of suburbanization associated with widening differentiation in the risk of exposure to high poverty neighborhoods among black, white and Latino households across urban and suburban locations. This research also models how metropolitan segregation associates with differences across spatial locations in terms the risk of experiencing neighborhood disadvantage and poverty concentration. Results demonstrate how the city/suburb approach to understanding segregation masks substantial differences in the risk of neighborhood disadvantage

and poverty concentration across space.

Chapter 3 decomposes metropolitan black-white segregation into components representing the shares attributable to segregation within and between different urban and suburban locations. This research sheds new light on how declining segregation overall coincided with a changing spatial composition of segregation within and between urban and suburban areas, including greater segregation between older suburb, newer suburb and rural/exurb locations among larger metropolitan areas. This chapter also identifies metropolitan characteristics associated with differences in black-white segregation within and between older suburb, newer suburb and rural/exurb locations.

Chapter 4 analyzes the household dynamics related to changing spatial locations of segregation and continued black-white inequalities in exposure to high poverty neighborhoods. This study tests for inequality in black and white households' likelihoods of moving to poor neighborhoods, whether urban or suburban, net of differences in household composition. It also evaluates whether there is racial disparity in the likelihood of nonpoor urban and suburban neighborhoods becoming poor in place sometime after a household move. Results of Chapter 4 corroborate how black and white households' residential outcomes among suburbs remain relatively stratified, with black households more likely to experience neighborhood disadvantages even following moves to suburban locations.

Taken together, this dissertation informs how residential stratification is becoming increasingly suburban. The novel evidence in these chapters demonstrate racial and ethnic segregation's importance for inequalities in exposure to urban and suburban forms of neighborhood disadvantage, and motivate policy to improve equity in neighborhood conditions across metropolitan space.

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DEDICATION

For Sydney, my family, my mentors and my friends.

Chapter 1

SEGREGATION, SPACE AND INEQUALITY

Seminal research on urban poverty and racial segregation notes how suburbanization was an integral factor in explaining increasingly racialized poverty and unequal social worlds of black and white households throughout the 20th century [84] [16]. Up until the Fair Housing Act of 1968, discriminatory policies constrained black and other non-white households' residential choices to neighborhoods, typically in cities, that various housing market actors and the Home Owners Lending Corporation (HOLC) had "redlined" as less desirable due to minority representation [26]. Meanwhile, whites' preferences for avoiding integrated neighborhoods and those with rising black representation interacted with these discriminatory policies and practices promoting homeownership, galvanizing their out-mobility to newly-developed and racially-exclusive suburban areas [31]. These general dynamics underpin the now taken for granted structure of residential segregation in U.S. metropolitan areas, that is, segregation where black households reside in city neighborhoods and white households reside in suburban neighborhoods.

The common conception of suburbs as advantaged and of segregation as between city and suburb follows in large part from policies and population dynamics of more recent generations. Adoption of automobiles as a means for transportation, involvement of the Federal government in housing affairs (though initially, only in a discriminatory capacity), and deindustrialization of the

U.S. economy contributed to the increasingly advantaged structural position of suburbs in relation to the increasingly disadvantaged position of cities [31] [91]. The net results of these changes were high levels of black isolation and concentration of poverty within U.S. cities, in contrast to low poverty suburban neighborhoods with new homes and growing job opportunities that whites were continuing to move to. Though scholarship had previously noted how black households were especially segregated compared to other racial and ethnic groups, the worsening of central city poverty generated research observing how black and white households resided in different social worlds, with this residential inequality an explanation for racial inequalities in socioeconomic status and exposure to hazards like crime [60] [68].

The notion that cities and suburbs possess different positions within the broader social structure of metropolitan areas is implied in scholarship treating suburban locations to be indication of upward socioeconomic mobility among different ethnic groups [1]. However, the relative ordering has not always been this way, with suburbs holding the lower position for much of their existence prior to the 20th century. Before the suburbanization boom within the United States, suburban spaces within developed areas were not categorically places of advantage, but instead tended to have substandard housing (e.g. lacking water and sewer systems) and weaker economic opportunities compared to cities [31]. In this sense, the notion of "spatial assimilation" through moves to suburbs from cities may be more specific to this particular moment in U.S. history than a general observation about the residential social structure of populations living in developed spaces.

A longer view of the relationship between cities and suburbs informs how broadened suburbanization across race, ethnicity and socioeconomic status could gradually reshape the spatial structure

of racial and ethnic stratification in U.S. metropolitan areas. This does not have to be a complete reversal, in fact, the most likely pattern will just be blurring of city/suburb differences in aggregate due to greater differentiation between suburbs. Indeed, evidence points to substantial differences in neighborhood quality and composition across suburban contexts of varying housing stock age and density [2] [9]. For this reason, some moves to suburbs by black and Latino households may reflect the "spatial assimilation" that prior research theorized about when moves to suburbs reflect increasing household socioeconomic resources, but this does not have to be the only trajectory, or even the most likely one for a household, as moves to suburbs become more common for all households. A wider potential range of suburbanization outcomes means that continuing to rely on the conceptual dichotomy of city/suburb for understanding the spatial form of segregation obscures how suburbs are becoming more differentiated over time and how cities and suburbs might become more similar too.

The changing form of racial and ethnic segregation in U.S. metropolitan areas that greater suburbanization portends is important for understanding socioeconomic inequalities between black, Latino and white households because high poverty neighborhoods are associated with ecological disadvantages, and this should hold whether a neighborhood is located in a city or a suburb. Higher levels of segregation theoretically associate with a divergence in the typical outcomes of suburbanization by race and ethnicity as mobility patterns become more stratified regardless of socioeconomic resources. For example, in a more segregated metropolitan area, this could mean black and Latino households are relatively more likely to move to higher poverty suburban neighborhoods where employment opportunities might remain tied to other spatial locations like the central city

or other suburbs. This example illustrates how neighborhood disadvantages like spatial mismatch from employment might remain salient to socioeconomic differences by race and ethnicity, even if the spaces in question differ from how the disadvantage was originally conceptualized. Beyond specific suburban forms of disadvantage, there is a wide body of research showing how "neighborhood effects" associated with exposure to high poverty contexts generally worsen individual outcomes across domains of socioeconomic status, health and well-being, making exposure to concentrated disadvantage a mechanism explaining intergenerational transfers of household poverty [78] [82]. Thus, inequalities in residential outcomes and segregation in aggregate are a fundamental barrier to equity by race and ethnicity, and understanding whether suburbanization is remedying or only serving to change the locations of disadvantage according to place is important to theorizing about the future of racial and ethnic inequality in U.S. metropolitan areas.

1.1 *Chapter Overview*

The three substantive chapters of this dissertation empirically investigate the suburbanization of residential segregation and assess its importance for continued residential stratification between black, Latino and white households. These chapters contribute important evidence about the present-day form and implications of residential segregation in U.S. metropolitan areas, where populations have become majority suburban over time with little indication of abatement in this trend. Throughout the following studies, I introduce a novel method for studying differences between suburban neighborhoods rather than treating them as a single area, with this typology of urban and suburban locations crucial to understand differentiation in neighborhood segregation and

quality across metropolitan space,.

Chapter 2 details how trends in the risk of exposure to a poor neighborhood and the concentration of poverty differed substantially across city, older suburb, newer suburb and rural/exurb locations within metropolitan areas. A first step in this study is to describe results from a method for measuring location types within metropolitan areas that combines information about the sociodemographic composition of neighborhoods as well as their arrangement with each other in physical space. I also identify the degree to which metropolitan racial and ethnic segregation interacts with these observed trends in terms of neighborhood poverty's changing locations and severity. In metropolitan areas with high levels of black-white or Latino-white segregation, both black and Latino populations theoretically have an elevated risk of residing in a poor neighborhood, regardless of whether it is urban or suburban. In contrast, the neighborhoods in newer suburb and rural/exurb locations where whites increasingly reside have potentially kept relatively low poverty rates over time in the presence of greater segregation, meaning that whites have a disproportionately lower risk of exposure to neighborhood disadvantage, even for persons with incomes below the poverty line.

Chapter 3 investigates how the composition of black-white metropolitan segregation has changed over time, due to trends in neighborhood integration and population distribution across the four focal location types for urban and suburban areas. The empirical portion of this chapter involves decomposing segregation into components for segregation occurring within neighborhoods of the four location types, in addition to components for segregation attributable to segregation between a.) the city and all suburban locations and b.) the three different suburban location types. After describing the decompositions for the average among all U.S. metropolitan areas and the 50 largest

metropolitan areas, I review the most recent compositions for the 20 most segregated metropolitan areas. Finally, I use linear fixed effects models to produce a within-estimate of how change in different characteristics of metropolitan areas associated with changes in the level of segregation within and between suburban locations. This contributes information on how the locations and depth of suburban segregation varies among metropolitan areas based on dynamics related to population composition, economic activity and political fragmentation.

Chapter 4 models the household dynamics that underpin the observed disparities between black and white households in the likelihood of residing in a poor neighborhood, whether they reside in a urban or suburban location. Using nearly forty years of survey responses to the Panel Study of Income Dynamics, this research considers two different pathways by which racial disparities in the likelihood of being exposed to neighborhood disadvantage can emerge. First, black households may be relatively more likely to move to either an urban or suburban neighborhood which is already high poverty, though the racial disparity may differ substantially between types of suburban locations. Second, black households who move to nonpoor neighborhoods in either cities or suburbs may also be more likely to experience exposure to neighborhood poverty through the neighborhood becoming poor around them, a dynamic which segregation theoretically exacerbates. Considering all residential mobility to urban and suburban destinations that ends in a nonpoor neighborhood as the same could therefore mask important heterogeneity in the trajectory of the urban and suburban neighborhoods that households are moving to.

The final chapter summarizes the important findings from the three substantive chapters' empirical analyses. In addition to this summary, it discusses their combined contribution too how

scholars and policymakers should think about segregation when conceptualizing where it creates advantages and disadvantages in the metropolitan landscape.

Chapter 2

SEGREGATION AND THE DISTRIBUTION OF POVERTY ACROSS METROPOLITAN SPACE

Neighborhood poverty is key to understanding how the concentration of disadvantaged households reproduces socioeconomic inequalities over time through "neighborhood effects" associated with exposure to places with high levels of crime, joblessness and other social problems. William Julius Wilson's scholarship noted how changes to the economic base and class structure of U.S. metropolitan areas had generated what he termed social dislocations, with concentrating disadvantages of living in poor urban neighborhoods becoming an explanation unto itself for the deteriorating fortunes of the urban poor [91]. African Americans living in central cities, particularly those below the poverty line, were impacted by the decline of blue-collar job opportunities and migration of middle class households to suburban areas through rising levels of neighborhood poverty in the contexts around them. The worsening conditions in urban neighborhoods meant growing disadvantages in terms of public services, economic opportunities and ecological hazards, all which exacerbated the already high concentration of poor households in urban neighborhoods due to racial and ethnic segregation. The renewed attention to place-based inequality that Wilson's research called for generated substantial literature documenting links between exposures to high poverty contexts and worsened socioeconomic attainment, increased rates of crime victimization, and poorer mental health, among a myriad of other health and human development outcomes [82] [77] [79] [46].

Household and neighborhood poverty are increasingly suburban issues too now, despite concentrated poverty remaining largely unmitigated within central cities. Since 1990, the average neighborhood poverty rate and the overall number of poor persons increased substantially among suburbs to where the majority of the poor population in the U.S. is now suburbanized [2]. These trends evince how neighborhood poverty has only grown more important as social problem within the United States in the approximately three decades since William Julius Wilson's landmark book on poverty in U.S. metropolitan areas, though its spatial location is changing some to reflect greater suburbanization [27]. The spatial composition of suburban poverty is not even, though, with substantial heterogeneity in the prominence of poverty between different suburbs based on features of the municipality (e.g. zoning) as well as the greater metropolitan area (e.g., the overall extent of suburbanization).

Residential segregation by race and ethnicity appears to be an important characteristic of metropolitan areas when considering the suburbanization of poverty, and while segregation has declined some since the 1970s, black-white segregation remains at relatively high levels, particularly in some of the largest metropolitan areas [53]. The continued existence of high levels of segregation in some metropolitan areas is therefore a relevant explanation for why exposure to suburban high poverty neighborhoods poverty largely follows a racialized pattern, just as in central cities. For example, while the majority of the poor suburban population was non-Hispanic white according to the 2010-2014 American Community Survey, poor black and Hispanic households were about twice as likely to live in high poverty suburban neighborhoods than poor whites [63]. Suburban neighborhood poverty in segregated metropolitan areas implies a potential for continued racial

and ethnic inequalities in neighborhood quality through disparities in exposure to new forms of suburban place-based disadvantage [2]. These disadvantages include school districts with relatively limited tax bases for public services like education, locations with lower proximity and growth in employment opportunities and neighborhoods with weaker availability of social service providers for households in need of assistance. Coupled with even worsened urban neighborhood poverty in many cities, there is more urgency than ever for understanding how metropolitan segregation corresponds to residential inequalities in urban and suburban locations alike.

The present study investigates a set of research questions regarding segregation and the degree to which neighborhood poverty, as well as the concentration of poverty, changed in its distribution across cities and different types of suburbs from 1990 to approximately 2015. A specific aim of this research is to measure the degree to which racial segregation interacts with spatial locations (i.e., cities, older suburbs, newer suburbs and rural/exurbs) and thereby has different meanings for neighborhood poverty or poverty concentration across space, net of trends over time. Overall, this study seeks to understand how segregation places black and Latino households at greater risk of experiencing "neighborhood effects" related to neighborhood poverty exposures, regardless of whether they reside in urban or suburban neighborhoods.

2.1 *Background*

Notions of suburban poverty can refer to the presence of poor households in suburbs at two different scales. The first speaks to growing numbers of *household* poverty in suburbs, and the second to rising prevalence of *neighborhood* poverty within suburban places. Both are important because

they suggest changing locations of poverty due to shifting patterns of new residential development, affordable housing and employment opportunities. However, there are two reasons the latter form of poverty is particularly important for understanding contemporary forms of residential stratification.

First, poor neighborhoods tend to have worse housing stocks, weaker job opportunities, fewer educational resources, and greater shortfalls in social service provision relative to need [33] [64]. These additional disadvantages are dimensions of how living in neighborhoods with high poverty ($\geq$ 20 percent of persons with incomes below the Federal Poverty Line) can reproduce household socioeconomic status, particularly poverty, over generations [82]. While poor suburban neighborhoods do not tend to reach the extreme poverty like some urban contexts where 40 percent or more of residents have incomes below the poverty line, neighborhoods with high poverty (particularly rising poverty) are still important.

Galster (2002) finds that poverty rates of 20 percent are around the inflection point at which the social costs of neighborhood poverty amplify. Beyond a poverty rate of 20 percent, “neighborhood effects" in terms of weakened socioeconomic attainment and greater prevalence of problem behaviors substantially increase in importance, which is to say one’s place (i.e. neighborhood) becomes important as a distinct factor associated with differences in household and community well-being [24]. While average central-city neighborhood poverty continues to be more acute than neighborhood poverty in suburbs, a greater share of all people living in deep-poverty (i.e. income $\leq$ 50 percent of the Federal Poverty Line) now live in suburbs than in central cities. Further, trends since 1990 narrowed the gap between cities and suburbs such that there are increasingly as many high poverty census tracts in suburbs as in central cities (43 percent of cities’ total number of poor

neighborhoods in 1990, 72 percent for 2010-2014 American Community Survey) [2].

The second reason concerns aggregate disparities by race and ethnicity in terms of who lives in poor neighborhoods. Racial and ethnic segregation in most metropolitan areas, particularly among the largest, raises the likelihood that people of color disproportionately experience disadvantages due to neighborhood poverty. The still-stark contrast in poverty concentration between central city and suburban places is a legacy of *de jure* segregation and the exclusionary nature of suburban development [60], [21], [76]. For example, in 2014 the average central-city neighborhood poverty rate was still nearly twice that of suburban neighborhoods, about 23 percent compared to 12 percent [2]. This illustrates how there are still substantial differences in concentration of poverty between spatial locations, with urban locations having the most acute concentration. The aforementioned trends for the number of poor neighborhoods in urban and suburban areas suggest rising prevalence of neighborhood poverty in suburbs, but there is also evidence of emerging racial and ethnic inequalities in the neighborhood poverty experience by black, Latino and white households across both urban and suburban locations [63]. Substantial growth of poverty in some suburban areas therefore appears to be producing familiar inequalities by race and ethnicity in contextual attainment, and implies a potentially changing residential form in U.S. metropolitan areas where poor suburban neighborhoods hold a disadvantaged, segregated structural position much like poor neighborhoods in central cities, albeit with new, sometimes different challenges related to suburban location and political organization.

2.1.1 Suburban Neighborhood Poverty

Suburban neighborhoods have historically been seen as an indicator of higher degrees of household residential attainment, and in popular discourse, suburbs possess a stereotype of being homogeneously advantaged. Further, early studies of neighborhood attainment used suburbanization as the marker for spatial assimilation of racial and ethnic groups [1]. Rising overall levels of neighborhood poverty, however, raise questions about whether suburbs are as homogeneous as they are sometimes conceptualized, and whether some features of suburbs like low density, greater distance from city centers and higher degrees of car-dependency now actually factor into the residential disadvantages generated by segregation and its importance for the distribution of poverty.

Suburban neighborhood poverty has been on the rise overall since 1990, and previous research finds that older suburbs (sometimes called "inner-ring" suburbs) typically located in the Midwest and Northeast tend to have higher incidence of neighborhood poverty compared to newer suburbs located further from these metropolitan areas' city centers. [2]. Though there is some inherent complexity in identifying types of suburban neighborhoods (c.f. [9], [2]), they are usually differentiated based on their housing stock's age or density, and coincidentally, their geographic location given historically outward patterns of suburban development. Relative to poor neighborhoods in newer suburbs, older suburbs have greater numbers of recent migrants from their respective central city, greater representation of black and Latino persons and larger shares of people working in the central city [27]. Other research observes that older suburban neighborhoods tend to have relatively weaker economic bases and are impacted by gentrification-related housing demand in the central city [9]. In contrast, poor neighborhoods in newer suburbs have average majority-white populations, lower

density, fewer recent migrants from the city, and greater distance from a metropolitan area's central business district.

Living in a poor suburban neighborhood potentially presents similar poverty-related disadvantages experienced in central cities, but also new ones related to suburban location and organization. Kain's theory of spatial mismatch from economic opportunities has historically been considered in a central-city/suburb sense, but gentrification within cities and poverty-related trends in suburbs are part of a general restructuring of opportunity and disadvantage in U.S. metros [35], [20]. The weak economic base of inner-ring suburbs is a reason for the greater shares of persons employed in the central city among these suburban places [27]. Poor central-city neighborhoods are at least better served by public transportation, whereas car transportation is sometimes necessary within suburbs. Poor neighborhoods in low-density, newer suburbs potentially have more job availability compared to inner-ring suburbs, though there may be an even greater need for car-dependence in these farther flung contexts [27]. Households living in poor suburban contexts therefore face degrees of spatial mismatch, sometimes even comparable to the original conception of mismatch with urban poor neighborhoods, depending on their suburb's economic health, density and resources like public transportation.

Compared to many central cities where concentrated poverty has already been recognized as an important issue, suburbs also tend to have weak organizational activity aimed at alleviating household poverty [2], [63]. A survey of suburban jurisdictions in New York, Los Angeles and Chicago showed that most suburbs lacked non-profit organizations of their own for providing employment assistance, and only about half had a food assistance provider. The lack of effective

safety net provision in these places means poor households living in poor suburban neighborhoods may go without assistance that can shorten spells of poverty or at least mitigate poverty-related problems. Though non-profit assistance is only one component of reducing household poverty, in this respect poor suburban contexts may be demonstrably worse for poor households than poor neighborhoods in cities [64].

The existing research on suburban neighborhood poverty underscores that there are important variations in the quality of neighborhood poverty and in suburban places' relative capacity to actively help poor households. More generally, there appear to be comparable disadvantages associated with living in high poverty neighborhoods, whether they are urban or suburban, though the spatial locations and composition of suburbs do matter to the form those disadvantages take. Understanding how risk of exposure to neighborhood poverty and the concentration of poverty varies across suburban locations and based on segregation is therefore crucial to properly conceptualizing where residential inequalities are most prevalent, and what interventions are most likely to assist poor households and deconcentrate poverty.

2.2 *Research Questions*

There are three focal research questions that guide the empirical portion of the present study:

1. How do suburbs differ based on their location and the composition of their housing stocks, and can these differences facilitate measuring types of suburban locations within a metropolitan area?

2. How has risk of exposure to neighborhood disadvantage in cities, older suburbs, newer

suburbs and rural/exurb locations changed over time and based on metropolitan racial/ethnic segregation?

3. How has the concentration of poverty across locations changed over time, and to what degree has this varied based on metropolitan racial/ethnic segregation?

2.3 *Data*

The following analyses draw on decennial U.S. Census data for 1980, 1990, 2000 and 2010 in addition to American Community Survey (ACS) 5-Year Estimates for 2013-2017. I use the Brown Longitudinal Tract Database (LTDB) to normalize all decennial estimates' census tract boundaries to those used for the 2010 Census [55]. Interpolating tract data from older boundary definitions to a common vintage is necessary to ensure comparability over time in terms of geographic boundaries for each tract unit, particularly since rapidly-growing tracts are where boundaries experience change. Census tracts are the smallest unit used in this study, each containing an average of about 4,000 persons (though there is considerable variation around this).

I define metropolitan areas using the Census Bureau's concept of Core-Based Statistical Areas (CBSA). These agglomerations of one or more counties have at least one urbanized area as their principal city/cities (e.g. Seattle-Tacoma-Bellevue CBSA), with the surrounding counties selected based on preserving local commuting patterns. The Census Bureau defines both Metropolitan and Micropolitan areas using these CBSA definitions, with the former covering all locations where there are at least 50,000 people among the counties that comprise the CBSA, and a urban center with at least 10,000 people itself. In addition to filtering to the CBSAs that meet these metropolitan status

requirements, I also limit the sample used in the following analyses to those with 5,000 non-Latino black persons at each time period to avoid the measurement bias present in segregation measures where population sizes are relatively small, particularly when using the ACS [65]. The resulting sample contains 231 metropolitan areas.

2.4 *Measures*

2.4.1 Locations within a metropolitan area

An important first task and contribution of this study is to define a measure indicating different types of spatial locations within each metropolitan area. Given the present study's focus on understanding differences in poverty dynamics across metropolitan space, I generate an indicator of city, older suburb, newer suburb and rural/exurb locations as the basis for disaggregating suburban space. While there is undoubtedly still heterogeneity in neighborhoods within the older suburb or newer suburb types, these categories form the basis for understanding, for example, how suburban neighborhoods with older, theoretically more affordable, housing stocks that are closer to city centers have changed over time in contrast to those which were recently developed, more expensive and farther flung relative to the urban center.

I use *hierarchical clustering with spatial constraints* to accomplish this task of defining urban, older suburban, newer suburban and rural/exurban locations [7]. In its essential form, hierarchical clustering is a multivariate statistical method for grouping units of observation according to their distances from each other across a set of input measures [37]. More technical information about this method and its application within the present study can be found in Appendix A. The method

advances the measurement goal of identifying different spatial locations by providing a means to classifying neighborhoods based on both their sociodemographic characteristics as well as their spatial position (that is, neighboring cases).

Table 2.1 lists the concepts and measures used for differentiating city, older suburb, newer suburb and rural/exurb locations within metropolitan areas. These are the four focal dimensions on which neighborhoods are compared to each other for determining a neighborhood's location type. Given the present study's theoretical framework that housing opportunities are key to structuring the poverty and segregation dynamics over time, the measures used in the cluster analysis capture features of the *political organization*, *density*, *housing stock* and *development* of neighborhoods within a metropolitan area. A stylized matrix of how each concept and measure are theorized to relate to the cluster-based measure of locations is provided in the right half of the table.

The first measure captures whether a given tract falls within one of the principal cities of the metropolitan area (e.g. within a city named in its official title, like Seattle-Tacoma-Bellevue, WA) in order to distinguish the most populated and economically active locations of each metropolitan area from the rest. These are two self-evident but important characteristics of what it means for a location to be urban in quality. Furthermore, principal cities are salient to poverty and segregation in a given metropolitan area since they were the locations where non-white racial/ethnic households concentrated due to redlining and other forms of discrimination in housing and credit markets [76].

Beyond considering central city neighborhoods separately, an important goal of this measurement strategy is to disaggregate suburbs by characteristics of their housing stocks. Accordingly, the remaining measures used for clustering capture whether a given tract's housing or popula-

Table 2.1: Conceptual framework and measures used for hierarchical clustering

Concept	Measure	City	Older Suburb	Newer Suburb	Rural/Exurb
Political organization	Whether tract is located in principal city of metropolitan area	+	-	-	-
Density	Greater than or equal to metropolitan average housing unit density	+	+	-	-
Housing stock	Greater than or equal to metropolitan average share of housing units built in or after 1970	-	-	+	+
Development	Greater than or equal to metropolitan average share of persons rural	-	-	-	+

tion composition is greater than or equal to the average level for its metropolitan area in order to classify locations in terms of density, housing stock age and land development. These measures are determined in relation to a tract's respective metropolitan average due to substantial heterogeneity between regions of the U.S. in terms of a measure like housing stock age (e.g., the average share of units built in or after 1970 for Boston-Cambridge-Quincy, MA-NH in contrast to Portland-Vancouver-Hillsboro, OR-WA).

The density of housing is relevant to the relative availability of housing units in a given area and, in many metropolitan areas, is correlated with a measure of distance from the urban center. Distinguishing tracts based on housing stock age is important given the differences in cost and housing unit size between more recently built properties and those which were constructed before or during the postwar housing boom. Finally, the measure of land development provides insight into the degree to which land in the census tract remains in use for agricultural purposes, a quality relevant in determining the relative cost and availability of space for greenfield development (i.e. where the most distant housing developments are occurring).

I use the *simple matching distance* to compute each census tract's distance from all other census tracts in metropolitan areas on the set of dichotomous sociodemographic measures described above. The following formula defines distances based on the simple matching distance for tracts i and j where p is the number of variables positive for both tracts, q is the number of variables positive for the ith tract but negative for the jth tract, and r is the number of variables negative for the ith tract

and positive for the *j*th tract, and *s* is the number of variables negative for both tracts:

$$d_{ij} = \frac{q + r}{p + q + r + s}$$

The resulting measure of distance between tracts *i* and *j* indicates the proportion of variables where values were positive for one case but not the other over the total number of variables considered[1]. Overall, this provides a relatively intuitive measure of how comparable any two census tracts are in terms of the sociodemographic measures of interest.

The advancement brought by the clustering method used in the present study is that the resulting measure of location types also accounts for census tracts' adjacency to other units in physical space. Cluster analysis or threshold-based measures otherwise ignore any two tracts' spatial locations when determining their type, even when tracts which are closer to each other are more likely to be the similar than those which are more distant (i.e. Tobler's law). For a measure of different spatial locations in physical space, this is a particularly informative piece of the underlying relationship between census tracts to otherwise leave unobserved.

There is no *de facto* measure of what it means for a location to be a suburb or what differentiates suburbs from each other, and this study does not attempt to settle this debate. Instead, the method used in the present study focuses on differences in housing between suburbs because the types

[1]When clustering binary data, Jaccard distance is a commonly used alternative that ignores matching negatives [18]. Shared negative values are less informative when the binary covariates are 1000 rare events, and the simple matching distance would show high degrees of similarity for two cases with only 1 or 2 positives even if they share no common measures. However, in the present case, the positive values are neither rare nor expected to be more informative than the negatives. For these reasons, the simple matching distance provides a reasonable and preferable method for computing distances.

and cost of housing in a neighborhood fundamentally structure the pathways to suburbanization that are open to a given household. Suburbs are a thorny concept based on notions about their location and housing, so the present study's approach tries to grapple with the multidimensionality in common debate about what it means for a neighborhood to be suburban. Further, accounting for the arrangement of census tracts in physical space bolsters the value of the measure for describing differences between metropolitan areas in their patterns of suburbanization. Contiguous regions lend themselves to talking about different types of places in a metropolitan region because the levels being measured indicate coherent spatial zones.

2.4.2 Neighborhood poverty rates and concentration of poverty

Measures for population risk of exposure neighborhood poverty and concentration of poverty are used for answering the present study's research questions about segregation and change over time in neighborhood poverty within metropolitan areas. These measures provide complementary insights into the distribution of poverty across metropolitan space, in addition to potential racial inequalities in exposure to high poverty contexts. According to Jargowsky (1997), neighborhood poverty rates measure the prevalence of exposure to high poverty neighborhoods among the overall population or specific racial/ethnic group [33]. In the present context, this accordingly provides insight into the degree to which populations are at risk of exposure to neighborhood disadvantage whether they live in city, older suburb, newer suburb or rural/exurb locations. In contrast, the concentration of poverty indicates the extent to which the poor, already facing disadvantage in terms of their income, additionally face ecological disadvantages in terms of limited socioeconomic opportunities, higher

crime and worsened pollution [33].

I define a high poverty neighborhood as a census tract where the share of persons with incomes below the Federal Poverty Line (FPL) equals or exceeds 20 percent. Then, for each metropolitan area I measure the neighborhood poverty rate in each location by taking the total number of persons living in high poverty neighborhood within a given location type and dividing this count by the total number of persons within the location. A similar measure of black neighborhood poverty rates for a given location can be obtained by diving the total number of black persons living in high poverty neighborhoods within a given location by the overall count of the black population for the location. I also compute white and Latino neighborhood poverty rates for each location using the same measurement strategy applied to these racial/ethnic groups' respective counts for reference, though these results are summarized rather than reviewed in full.

The other focal measure, concentration of poverty, summarizes the extent to which poor households reside disproportionately in high poverty neighborhoods within a given location type in a metropolitan area. Racial segregation raises the likelihood that non-white persons are exposed to high poverty neighborhoods through unevenness in neighborhood population compositions, with forms of economic segregation further exacerbating the likelihood that poor persons reside in such contexts.

2.4.3 Segregation and racial/ethnic composition

I use the dissimilarity index (D) to provide an interpretable summary of black-white and Latino-white segregation in each metropolitan area at each time period. This measure indicates the

proportion of all black and white (or Latino and white) persons would need to move neighborhoods in order to achieve integration across metropolitan space (i.e. neighborhoods have same composition as metropolitan area). Values of the dissimilarity index are obtained with the following formula:

$$D = \frac{1}{2} \sum_{i=1}^{N} \left| \frac{a_i}{A} - \frac{b_i}{B} \right|$$

The dissimilarity index ranges between 0 and 1, with 1 indicating complete segregation and that tract populations are as uneven as possible relative to the overall metropolitan population composition. Observed black-white dissimilarity values typically varied between .2 and .8, whereas Latino-white dissimilarity values typically varied between .1 and .7. These segregation measures are based on Census counts where the black population is defined using the total number of non-Latino black persons, the white population using the total number of non-Latino white persons and the Latino population using the total number of Latino persons. Similarly, measures of neighborhood composition (e.g. percent non-Latino black) summarize the share of persons in a tract belonging to a particular racial/ethnic group.

There are commonly used thresholds that aid in interpreting values of the dissimilarity index. Extreme levels of segregation are typically denoted using a threshold of .8 or greater, high levels with .6-.8 or greater, moderate levels with .4-.6 and low levels with .4 or less.

2.5 *Analytic Strategy*

I first present choropleth maps indicating the spatial location typology for three example metropolitan areas and discuss the spatial distribution of locations within each of these example cases. These

provide insight into the spatial structure captured by measuring location types with the cluster analysis. Summary statistics on the average composition of tracts in each location type then illustrate trends in the typical racial/ethnic and socioeconomic profile of neighborhoods between urban, older suburban, newer suburban and rural/exurban locations.

Following this initial description of the data, I model the overall neighborhood poverty rate, black neighborhood poverty rate, Latino neighborhood poverty rate and concentration of poverty within each location type of a metropolitan area to understand how the the distribution of poverty in a given spatial location changed over time and varied based on metropolitan segregation. Model 1 includes only linear terms for location types, temporal variation and black-white segregation. This provides a baseline model for evaluating the degree to which change over time and the importance of segregation varies between spatial locations. Model 2 introduces an interaction between time period and location types to specify location-specific trends. Then, Model 3, the best fitting model for each outcome in terms of AIC and BIC, interacts location types with time and segregation separately. These two-way interactions with location type capture differences between locations in trends over time and differences between locations in how segregation matters for neighborhood poverty. The joint contribution of location-specific trends and relationships with segregation is illustrated through predictions from fully-specified models. Three-way interactions of segregation, spatial location and time trend were tested, but this specification where the association of segregation for each location varied over time did not improve fit over the models considered here.

I include metropolitan fixed effects in the regression models that follow in order to adjust estimates for time-invariant heterogeneity between metropolitan areas related to neighborhood

poverty levels or the concentration of poor persons into high poverty neighborhoods. All models are also adjusted for time-varying metropolitan population composition using the log of the total metropolitan population, the black population share, the white population share and the Latino population share. Adjusting for these characteristics ensures that observed relationships between segregation, space and poverty dynamics are not confounded by differences in, for example, the overall population at risk of exposure to neighborhood poverty within the metropolitan area.

Models were estimated using ordinary least squares (OLS) with standard errors clustered by location type in each metropolitan area (e.g. Boston - Older Suburb) in order to account for the serial correlation of observations over time and heteroskedasticity in model errors. Results were robust to using a logistic regression specification that accounts for the bounded range of rates, though I present the linear regression results for ease of interpretation.

2.6 *Results*

2.6.1 Location types

Figure 2.1 displays the location types computed by the cluster analysis for the Chicago-Naperville-Joliet, IL-IN-WI metropolitan area. The largest yellow zone for this Midwestern metropolitan area captures the Chicago city center, with Naperville and Joliet respectively accounting for the other two yellow zones to the west and southwest of Chicago. Older suburbs (green) of this metropolitan area include Gary, Evanston and Waukegan, with organization of different older suburb zones roughly aligning with major thoroughfares into the Chicago city center. Next, newer suburbs (blue) form a swath of space mostly to the west of Lake Michigan and outside of Cook County where Chicago

is located. The rural/exurban type (purple) encompasses the greatest amount of all space, covering large shares of the counties farther flung from Chicago. The theorized location types for Chicago indicate a spatial pattern of somewhat concentric zones, with each successive type enveloping the space outside of the one it is to the west of. The two most notable exceptions to this structure, that is, the downtowns of Naperville and Joliet, reflect population and, to a lesser degree, employment growth in these locations over the past two decades that has made these locations suburban centers of sorts, complete with principal city status.

Next, Figure 2.2 shows the cluster-based location measure for the Dallas-Fort Worth-Arlington, TX metropolitan area. The large areas for Dallas, Fort Worth and Arlington reflect state laws favoring annexation over political incorporation in states across the South, as well as the relatively lower density of land use common throughout this region of the United States. Tracts with the city type account for a nearly contiguous metropolitan core of considerable size relative to all of the area that is not Rural/Exurb in type (i.e. relative to all urbanized area). Around these cities (and sometimes inside, based on early incorporation) are older suburbs, for example, Garland and Mesquite. Finally, a somewhat shapeless newer suburban periphery has filled in cracks between older suburbs and the three main cities of the metropolitan area.

Location types for the Seattle-Tacoma-Bellevue, WA metropolitan area are visualized in Figure 2.3. Seattle accounts for the largest single swath of tracts with the city type as would be expected, with older suburbs extending north and south of the respective halves of Seattle. While there are some older suburbs outside of Tacoma (to the south) and Bellevue (to the east), the relatively larger share of newer suburbs to the east and southeast of Seattle reflects the recent suburban

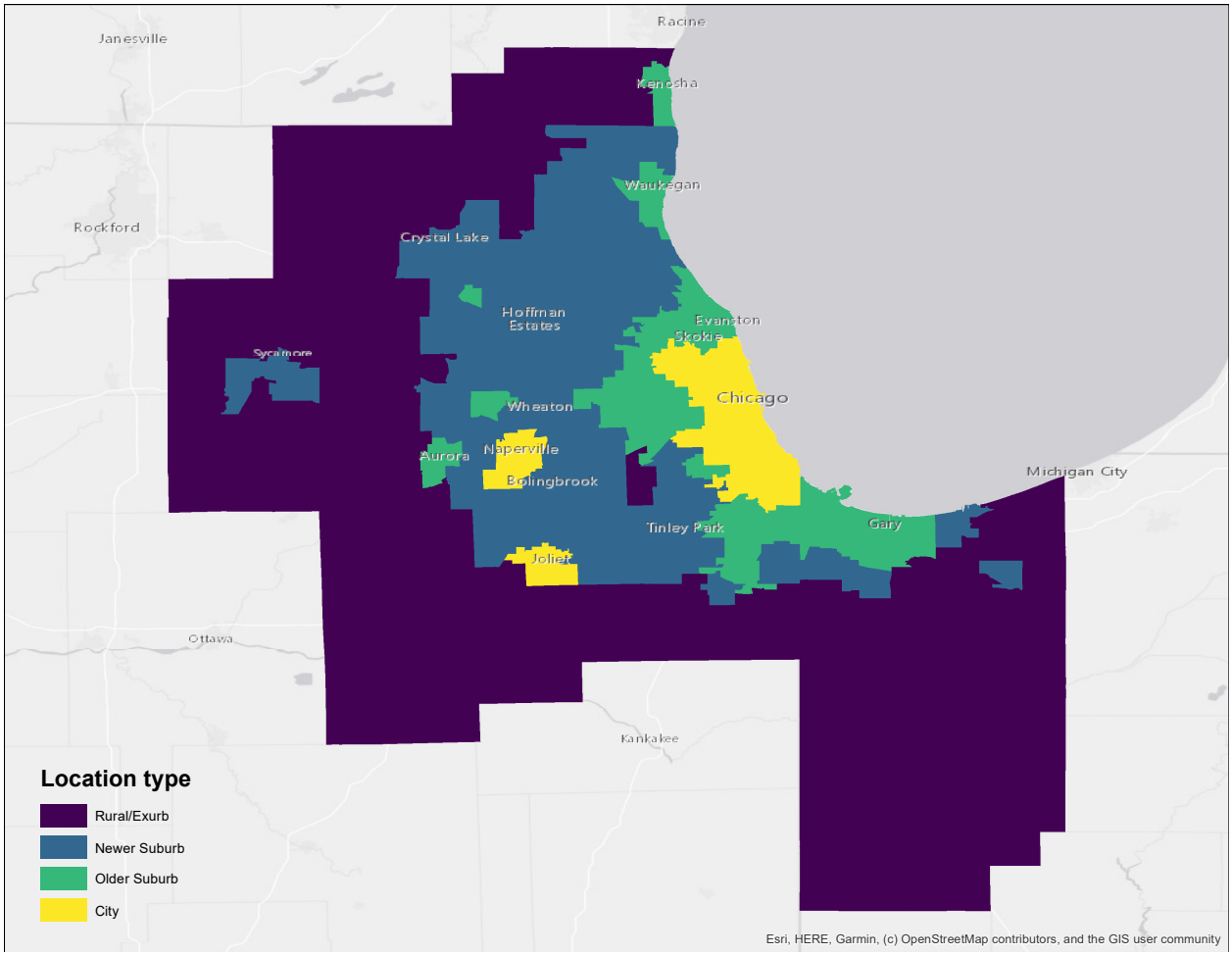

Figure 2.1: Location types for the Chicago-Naperville-Joliet, IL-IN-WI metropolitan area

growth in these parts of the metropolitan area. Redmond is mostly comprised of newer suburban neighborhoods in the affluent Eastside of King County, WA whereas South Hill is an example of a newer suburb in suburban Pierce County, WA. Finally, the rural/exurban locations of the metropolitan area include some distant towns in the mountainous region to the east, in addition to National Forest lands and otherwise uninhabited wilderness.

Table 2.2 displays the total population and average neighborhood racial/ethnic compositions of

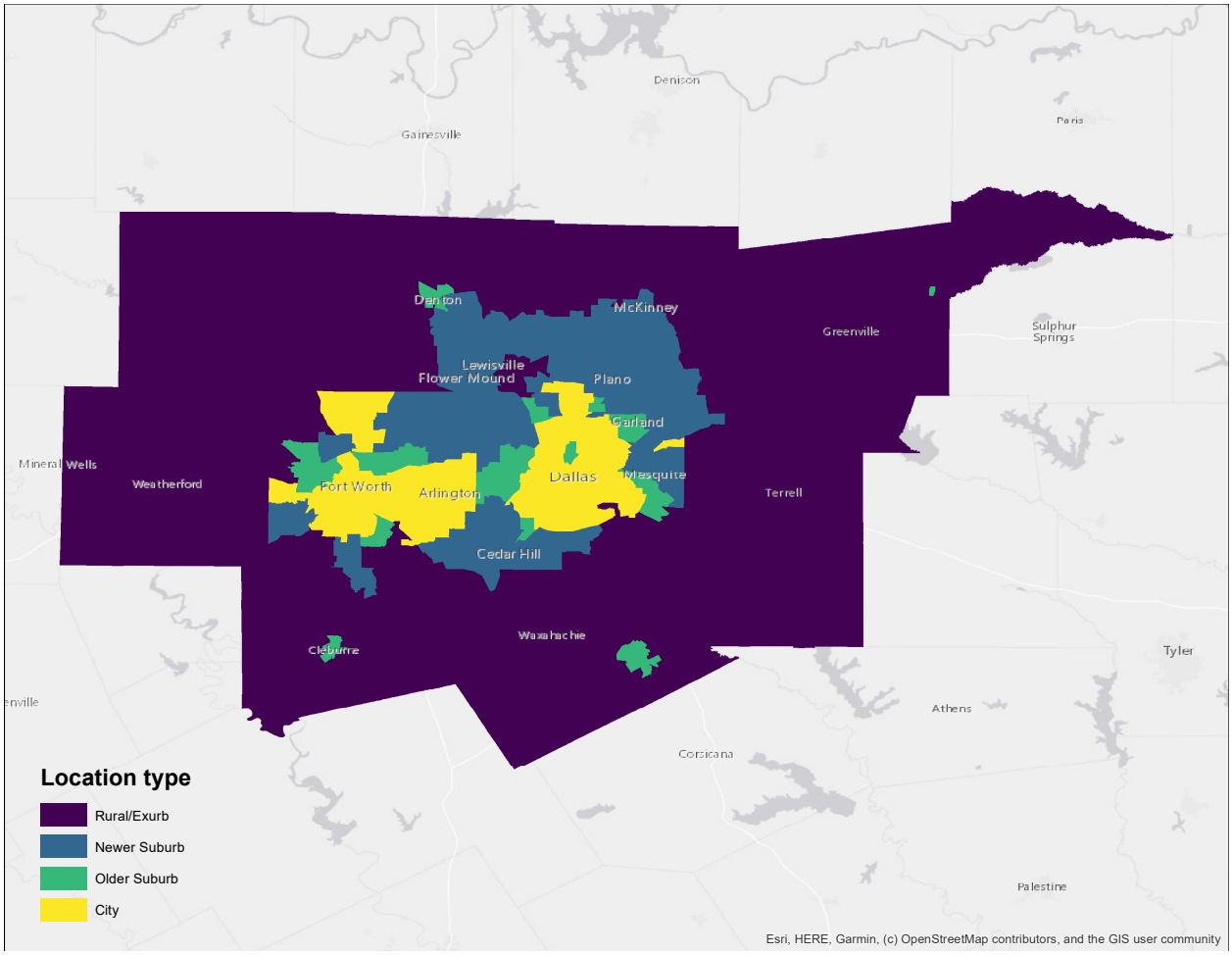

Figure 2.2: Location types for the Dallas-Fort Worth-Arlington, TX metropolitan area

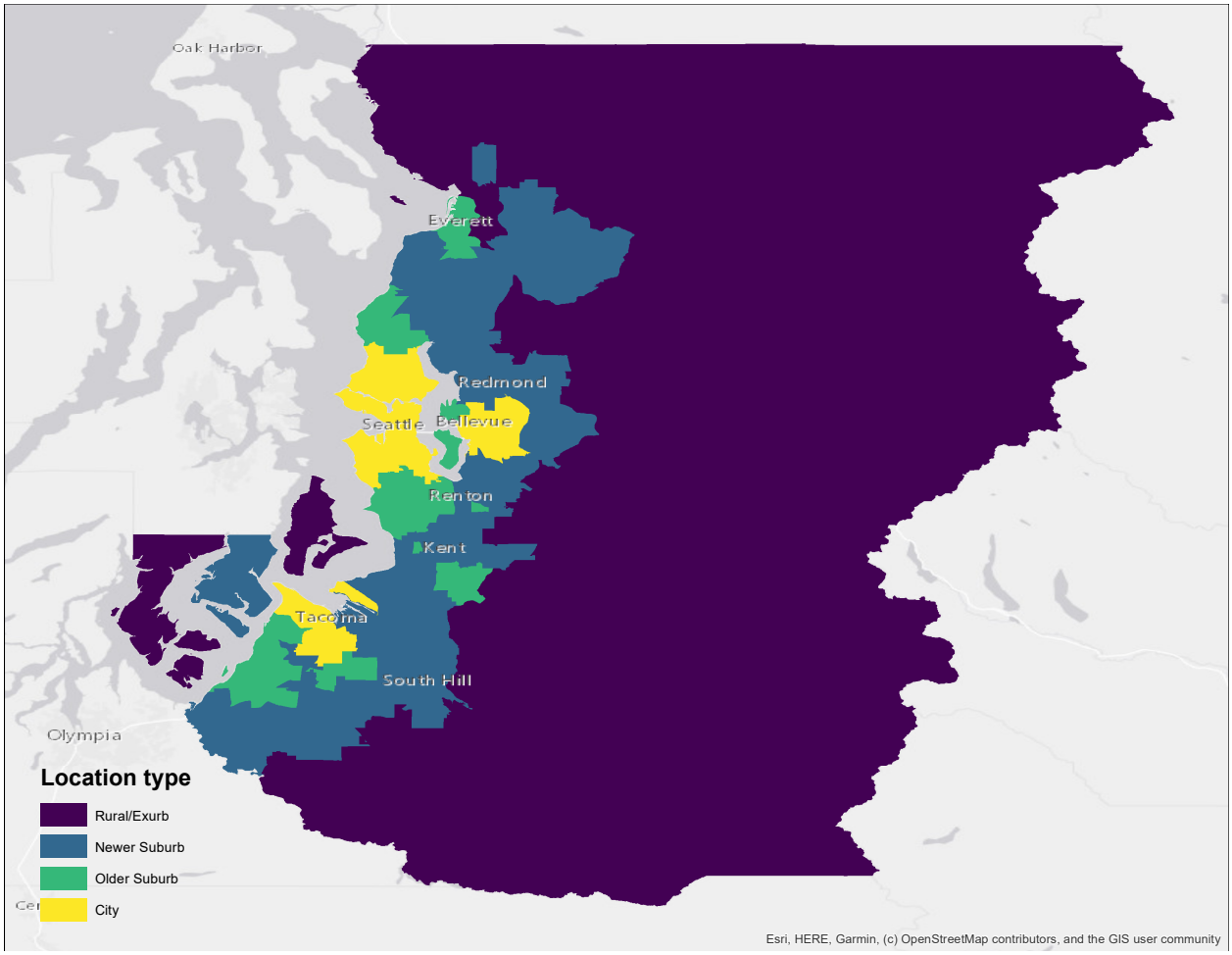

Figure 2.3: Location types for the Seattle-Tacoma-Bellevue, WA metropolitan area

the focal location types in 1980, 2000 and based on the 2013-2017 ACS. An initial observation is that the locations experienced very different trends over time in terms of their population size. Specifically, the total population living in newer suburb and rural/exurb locations increased the most growth over time, with the former type nearly accounting for the same number of persons as city locations by the 2013-2017 ACS. City locations experienced modest population growth, but despite this change over time, the majority of the U.S. metropolitan population currently resides outside of city neighborhoods. Only older suburbs experienced trends of near stagnation in terms of population size.

The average neighborhood compositions within each location also experienced notable changes over time. In 1980, the composition of all locations was majority white, though city locations had much greater representation in terms of black and Latino persons than the three suburban types. This disproportionality reflects how racial and ethnic segregation historically served to restrict non-white populations to urban locations[2]. Between 1980 and the 2013-2017 ACS, the average black and Latino share of neighborhood populations increased by about 5-10 percent across three of the four location types (city, older suburb, newer suburb), reflecting the general diversification of neighborhoods documented in other literature, including the emergence of so-called "global neighborhoods" in larger metropolitan areas [56]. However, rural/exurb locations saw relatively less change in terms of the black and Latino shares of the population. As such, the average neighborhood composition in terms of the non-Latino white share declined to varying degrees across types of suburbs, with newer suburb and rural/exurb locations remaining the location types

[2]The standard deviation around the mean for 1980 % black in city locations is $\approx$ 30 percent, indicating how segregation creates substantial unevenness in population distribution between neighborhoods.

Table 2.2: Total population and average neighborhood composition for 1980, 2000 and 2013-2017 ACS by location type

Time Period	Location	Population (M)	Avg. % Black	Avg. % Latino	Avg. % White	Avg. Pov. Rate
1980	City	64.40	20.48	10.32	70.94	14.68
	Older Suburb	34.61	10.03	7.85	84.14	8.76
	Newer Suburb	34.06	4.47	5.34	90.47	5.98
	Rural/Exurb	25.86	6.14	3.43	90.06	8.53
2000	City	73.47	24.64	17.76	49.09	17.59
	Older Suburb	36.98	14.24	15.81	62.85	11.24
	Newer Suburb	56.36	7.73	10.76	73.65	6.71
	Rural/Exurb	41.44	6.88	5.72	84.02	8.24
2013-2017	City	79.41	24.24	22.27	42.46	20.50
	Older Suburb	38.22	15.61	21.83	52.91	14.59
	Newer Suburb	71.41	10.35	16.68	61.53	9.72
	Rural/Exurb	52.04	7.57	8.99	78.23	10.54

with the highest representation of white persons into the 2013-2017 ACS observation period.

2.6.2 Neighborhood poverty rates

The next set of analyses address the second research question related to how the average risk of exposure to high poverty neighborhoods in the four locations changed over time, overall and by race/ethnicity. Table 2.3 lists coefficients from linear regression models of the overall neighborhood poverty rates of locations at each time period. This outcome measure provides insight into the share of each location's overall population that lives within high poverty neighborhoods and is therefore at risk of neighborhood disadvantage.

In Model 1, each of the suburban location types has a negative association with neighborhood poverty rates, describing the generally lower levels of neighborhood poverty among suburban locations compared to central cities. Variation over time was steady, significant increase, with neighborhood poverty levels about 13 percent higher, on average, in absolute terms in 2013-2017 than in 1980. Finally, higher levels of metropolitan black-white segregation associated with higher neighborhood poverty rates, though this was not significant. This non-significance when segregation is specified to have the same association across locations theoretically relates to how segregation is associated with greater disadvantage in some locations amid relative advantage in others.

Table 2.3: Linear regression of neighborhood poverty rate by location type, time period and metropolitan black-white segregation

	Model 1	Model 2	Model 3
Older Suburb	-0.114***	-0.109***	0.238**
	(0.014)	(0.016)	(0.079)
Newer Suburb	-0.286***	-0.207***	0.116*

	(0.011)	(0.012)	(0.058)
Rural/Exurb	-0.268***	-0.171***	0.208***
	(0.010)	(0.012)	(0.055)
Year=1990	0.058***	0.075***	0.093***
	(0.007)	(0.009)	(0.009)
Year=2000	0.035***	0.079***	0.105***
	(0.010)	(0.011)	(0.011)
Year=2010	0.101***	0.177***	0.216***
	(0.014)	(0.016)	(0.016)
Year=2015	0.131***	0.220***	0.258***
	(0.015)	(0.016)	(0.017)
Black-White Segregation	0.092	0.096	0.499***
	(0.065)	(0.061)	(0.082)
Log(Metro Total Population)	-0.062**	-0.060**	-0.062**
	(0.023)	(0.021)	(0.021)
Metro % Black	0.350	0.372†	0.369†
	(0.237)	(0.220)	(0.221)
Metro % White	-0.014	-0.012	-0.013
	(0.093)	(0.094)	(0.095)
Metro % Latino	0.275	0.282†	0.284†
	(0.167)	(0.163)	(0.165)
Older Suburb × Year=1990		0.022	-0.003
		(0.017)	(0.018)
Older Suburb × Year=2000		-0.010	-0.046*
		(0.016)	(0.018)
Older Suburb × Year=2010		-0.012	-0.065*
		(0.022)	(0.025)
Older Suburb × Year=2015		-0.026	-0.078**
		(0.022)	(0.025)
Newer Suburb × Year=1990		-0.057***	-0.080***
		(0.010)	(0.011)
Newer Suburb × Year=2000		-0.069***	-0.102***
		(0.012)	(0.014)
Newer Suburb × Year=2010		-0.129***	-0.178***
		(0.014)	(0.016)
Newer Suburb × Year=2015		-0.142***	-0.189***
		(0.016)	(0.017)
Rural/Exurb × Year=1990		-0.032*	-0.060***
		(0.013)	(0.013)
Rural/Exurb × Year=2000		-0.096***	-0.136***
		(0.012)	(0.014)
Rural/Exurb × Year=2010		-0.163***	-0.221***
		(0.014)	(0.017)
Rural/Exurb × Year=2015		-0.187***	-0.243***
		(0.015)	(0.017)
Older Suburb × Black-White Segregation			-0.554***
			(0.116)
Newer Suburb × Black-White Segregation			-0.519***
			(0.088)
Rural/Exurb × Black-White Segregation			-0.612***

			(0.082)
Constant	0.993**	0.913**	0.687*
	(0.316)	(0.296)	(0.293)
Observations	4133	4133	4133
Metro Fixed Effects?	Yes	Yes	Yes
AIC	-3998.61	-4150.36	-4316.36
BIC	-3916.36	-3992.20	-4139.21

Standard errors in parentheses
† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Model 2 interacts the period fixed effects with the location types to test for differences in trends over time. The coefficients from Model 2 show that newer suburb and rural/exurb locations had relatively shallower increases in neighborhood poverty over time, whereas the change over time for older suburbs was comparable to that of cities. This meant a total increase of about 20 percent in absolute terms between 1980 and 2013-2017 for city and older suburb neighborhood poverty rates, compared to a change of about 4-8 percent among newer suburb and rural/exurb locations. Like in Model 1, the term for black-white segregation in the metropolitan area shows a weak positive association that does not reach significance.

The coefficients from Model 3 then show how neighborhood poverty rates' trends over time and association with segregation differed significantly based on spatial location in a metropolitan area. The conclusions about change over time between locations remain mostly the same—for example, there was still significantly less increase in neighborhood poverty rates among newer suburbs and rural/exurb locations between 1980 and 2013-2017. Similarly, the rate among cities increased by about 26 percent, a slightly higher estimate than in the prior models. One difference, however, is that older suburbs show a significantly shallower trend compared to cities after allowing segregation vary in its association with neighborhood poverty across locations, though the magnitude of this

difference is much smaller than the two other suburban location types (i.e. newer suburbs and rural/exurb).

Metropolitan black-white segregation has significantly different associations with neighborhood poverty across the four locations. As segregation increases, the level of neighborhood poverty is expected to increase in cities. In contrast, the three suburban location type correlate with significantly lower neighborhood poverty as segregation increases. These interactions indicate that, net of differences in trends over time and population between metropolitan areas, suburban locations remain generally advantaged in metropolitan areas with greater black-white segregation when looking at their overall populations. There are some modest differences between older suburbs, newer suburbs and rural/exurb locations in the magnitude of this reduction of neighborhood poverty associated with segregation, with older suburbs and newer suburbs fairly comparable and the greatest reductions among rural/exurb locations.

Figure 2.4 displays the predicted neighborhood poverty rates from Model 3 in 1980, 2000 and 2013-2017 for each location type across the range of observed metropolitan black-white segregation values. These predictions are useful for assessing the joint contribution of trends over time and differences due to segregation for the current spatial distribution of neighborhood poverty. Neighborhood poverty has historically been a mostly urban social problem, particularly in racially segregated metropolitan areas, with city populations in highly segregated metropolitan areas possessing about twice as great of population exposure to neighborhood poverty in 1980 than the other suburban locations. At this time, all suburban locations had relatively low levels of exposure to neighborhood poverty, though levels were relatively higher among older suburbs. Overall, the em-

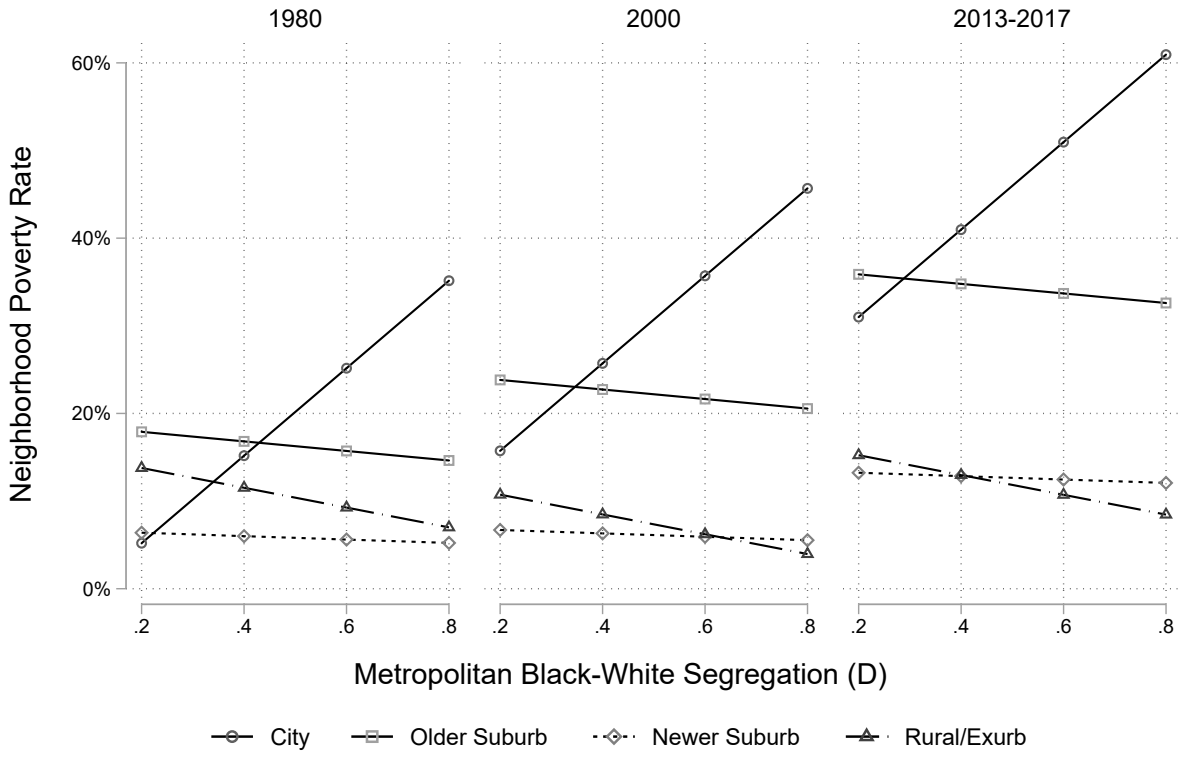

Figure 2.4: Predicted neighborhood poverty rates for 1980, 2000 and 2013-2017 ACS by location type and metropolitan black-white segregation

pirical picture for 1980 aligns well with the city/suburb divide that has been the dominant theoretical perspective for understanding differences in neighborhood poverty associated with segregation.

The neighborhood poverty rates among cities and older suburbs nearly doubled between 1980 and 2013-2017, indicating a substantially greater population at risk of the disadvantages related to neighborhood poverty in recent years. Specifically, the risk of exposure to neighborhood disadvantage within cities approximately doubled between 1980 and the 2013-2017 ACS, with older suburbs following closely with an increase of about 20 percent in absolute terms. In contrast,

the trend for newer suburbs and rural/exurb locations was mostly flat over the approximately 35 years between the left and right panes—levels of neighborhood poverty increased by about 5 percent in absolute terms over this period for newer suburbs amid no change in rural/exurb locations. Finally, racial segregation is an integral part of where this divergence across space is the most pronounced—it associates with significantly greater likelihood of exposure to neighborhood poverty within cities, amid countervailing decreases in neighborhood poverty rates among suburban locations.

These segregation dynamics contribute to a present-day gap in neighborhood poverty rates between cities and two most peripheral location types (newer suburb and rural/exurb) that is more than twice as large in the presence of high degrees of racial segregation. The rise in neighborhood poverty rates over time among older suburban locations suggests that this type of suburban neighborhood now has more in common with central cities than other suburbs in terms of households' risk of exposure to neighborhood disadvantage. While older suburbs do have a negative relationship between segregation and their neighborhood poverty rates when looking at the overall population, this is potentially related to their still-mostly white compositions even if there are now important differences in average racial/ethnic composition between suburban locations. For this reason, the overall neighborhood poverty rate may mask significant differences experienced by black and Latino households in these areas, particularly as segregation increases.

2.6.3 Black neighborhood poverty rates

The next set of model results assess the comparable change over time and relationships with segregation for each location type's black neighborhood poverty rate, that is, the share of the

black population in each location type that lives in a high poverty neighborhood. This measure accordingly provides insight into the degree to which the black population in each location is at risk of neighborhood disadvantages due to living in poor neighborhoods, and is important to the second research question about how risk of exposure to high poverty changed over time.

Table 2.4 shows coefficients from linear models of black neighborhood poverty rates using the same three model specifications as the regressions of overall neighborhood poverty rates. Model 1 coefficients indicate significant negative associations between the suburban location types and black neighborhood poverty rates, corresponding to how the suburban black population is generally at lower risk of exposure to neighborhood disadvantage than the urban black population. The coefficients for change over time describe a significant average increase in the share of the black population at risk of neighborhood disadvantage (14 percent in absolute terms) across all locations. Similarly, the significant positive association between metropolitan black-white segregation and black neighborhood poverty rates indicates a greater share of the black population in each location is exposed to poor neighborhoods as segregation increases.

Table 2.4: Linear regression of black neighborhood poverty rate by location type, time period and metropolitan black-white segregation

	Model 1	Model 2	Model 3
Older Suburb	-0.193***	-0.256***	0.040
	(0.018)	(0.025)	(0.099)
Newer Suburb	-0.450***	-0.452***	0.019
	(0.015)	(0.019)	(0.076)
Rural/Exurb	-0.419***	-0.409***	0.104
	(0.013)	(0.020)	(0.070)
Year=1990	0.076***	0.062***	0.084***
	(0.010)	(0.014)	(0.014)
Year=2000	0.034**	0.021	0.054**
	(0.013)	(0.016)	(0.017)

Year=2010	0.102***	0.090***	0.138***
	(0.017)	(0.021)	(0.022)
Year=2015	0.139***	0.129***	0.176***
	(0.018)	(0.022)	(0.022)
Black-White Segregation	0.338***	0.349***	0.850***
	(0.087)	(0.086)	(0.112)
Log(Metro Total Population)	-0.075**	-0.076**	-0.078**
	(0.029)	(0.029)	(0.029)
Metro % Black	0.153	0.157	0.156
	(0.285)	(0.279)	(0.280)
Metro % White	0.049	0.060	0.060
	(0.103)	(0.104)	(0.104)
Metro % Latino	0.148	0.165	0.165
	(0.193)	(0.189)	(0.190)
Older Suburb × Year=1990		0.057*	0.036
		(0.023)	(0.024)
Older Suburb × Year=2000		0.058**	0.027
		(0.022)	(0.024)
Older Suburb × Year=2010		0.105***	0.060†
		(0.027)	(0.031)
Older Suburb × Year=2015		0.090**	0.046
		(0.028)	(0.030)
Newer Suburb × Year=1990		-0.019	-0.052**
		(0.019)	(0.019)
Newer Suburb × Year=2000		0.011	-0.037†
		(0.019)	(0.021)
Newer Suburb × Year=2010		0.004	-0.067**
		(0.021)	(0.023)
Newer Suburb × Year=2015		0.015	-0.054*
		(0.023)	(0.025)
Rural/Exurb × Year=1990		0.028	-0.010
		(0.020)	(0.021)
Rural/Exurb × Year=2000		-0.004	-0.058**
		(0.019)	(0.021)
Rural/Exurb × Year=2010		-0.034	-0.112***
		(0.022)	(0.025)
Rural/Exurb × Year=2015		-0.041†	-0.118***
		(0.021)	(0.024)
Older Suburb × Black-White Segregation			-0.478**
			(0.151)
Newer Suburb × Black-White Segregation			-0.757***
			(0.115)
Rural/Exurb × Black-White Segregation			-0.827***
			(0.103)
Constant	1.239**	1.246**	0.953*
	(0.403)	(0.399)	(0.399)
Observations	4133	4133	4133
Metro Fixed Effects?	Yes	Yes	Yes
AIC	-1699.95	-1724.48	-1887.57

BIC	-1617.70	-1566.31	-1710.42

Standard errors in parentheses
† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Model 2 incorporates location-specific trends into the model of black neighborhood poverty rates. The level of black neighborhood poverty increased significantly between 1980 and the 2013-2017 ACS in cities, still estimated at about a 13 percent increase in level (based on the uninteracted year fixed effects). Among the suburban location types, older suburbs saw a significantly greater increase in black neighborhood poverty compared to cities, about 10 percent in absolute terms by the 2013-2017 ACS. In contrast, newer suburbs and rural/exurb locations experienced essentially the same trends as what was observed for cities. Like in Model 1, the coefficient for metropolitan black-white segregation was positive and significant, indicating greater shares of the black population in a location at risk of exposure to high poverty neighborhoods as segregation increases.

Model 3 of black neighborhood poverty rates adds an interaction between location and metropolitan black-white segregation. Incorporating this location-specific relationship for segregation modifies the substantive story in terms of change over time. The coefficients for average change among cities remains positive and increases some in magnitude, but the suburban trends indicate relatively comparable increases over time for older suburbs (vis-a-vis trends in cities) and relatively shallower change for newer suburb and rural/exurb locations. The Model 2 interaction denoting a strong positive older suburb trend was explained away by differences in black populations' risk of exposure to neighborhood disadvantage across levels of metropolitan segregation, suggesting that more segregated metropolitan areas are relevant to where upward trends were stronger.

Significant differentials in segregation's association with black neighborhood poverty by loca-

tion suggest that suburbanization to older suburbs in a segregated metropolitan area is a relatively stratified suburbanization pathway compared to other suburban locations. In older suburbs, a greater share of the black population is at risk of neighborhood disadvantages as segregation increases. In newer suburbs, a slightly greater share of the black population is at risk as segregation increases. Finally, in rural/exurb locations, the black neighborhood poverty rate is essentially unrelated to metropolitan black-white segregation (i.e. the linear term and interaction term cancel out). These differences imply that more segregated metropolitan areas have significantly more racialized patterns of exposure to neighborhood poverty among cities and older suburbs. They also inform how rural/exurb places, where the black population is generally the smallest, are the only suburban location where segregation does not associate with relatively exacerbated rates of exposure to high poverty neighborhoods.

Figure 2.5 shows the average black neighborhood poverty rates for 1980, 2000 and 2013-2017 across location types and levels of metropolitan racial segregation. First, these estimates evince how racial segregation is uniquely associated with levels of black neighborhood poverty in cities, as would be expected based on prior research and theory. Black neighborhood poverty rates in cities have only increased over time too, estimated to be about 15 percent higher (in absolute terms) in 2013-2017 compared to 1980. The 2013-2017 estimates indicate about 70 percent of the average city's black population lives in a high poverty neighborhood among metropolitan areas with high degrees of segregation.

Again, the results suggest a changing spatial distribution of residential inequalities in U.S. metropolitan areas, one where black-white segregation relates to greater shares of the black popula-

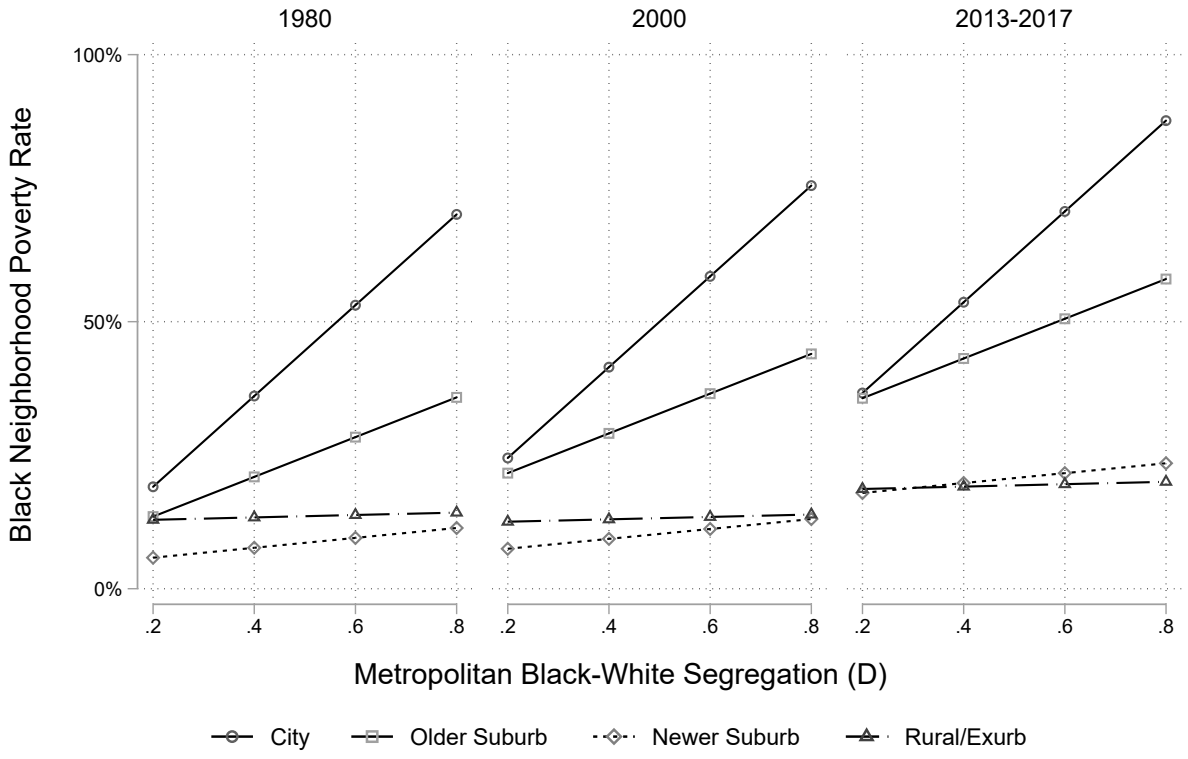

Figure 2.5: Predicted black neighborhood poverty rates for 1980, 2000 and 2013-2017 ACS by location type and metropolitan black-white segregation

tion in urban and suburban locations being at risk of place-based disadvantages due to neighborhood poverty. Trends over time have resulted in the predicted black neighborhood poverty rate among older suburbs resembling what is observed in cities more than other suburbs. In 1980, older suburbs in segregated metropolitan areas had higher levels of black neighborhood poverty than newer suburb or rural/exurb locations in a comparable metropolitan area, but the difference was modest compared to the gap between all suburbs' and cities' black neighborhood poverty rates. However, neighborhoods in older suburbs experienced the greatest change over time in black neighborhood

poverty rates, with 2013-2017 levels about 23 percent higher in absolute terms. Coupled with a positive association between metropolitan segregation and neighborhood poverty rates, black exposure to neighborhood poverty in older suburbs is particularly high among suburban contexts in more segregated metropolitan areas. Though the share of the black population at risk of neighborhood disadvantage is relatively smaller than the extreme level observed among cities, the majority of the black population in both of these locations nonetheless is predicted to reside in high poverty neighborhoods in a highly segregated metropolitan area (i.e., .60 or greater) at the 2013-2017 ACS observation.

The comparable estimates for white neighborhood poverty rates (not shown), differ considerably in average levels and the association between segregation and the white neighborhood poverty rate. The white neighborhood poverty rate for cities is one-half to one-third of the comparable black neighborhood poverty rate across time and levels of segregation, so while there is a positive association between metropolitan segregation and white exposure to neighborhood poverty in cities, there is still substantial difference in segregation's importance by race. Trends in the white neighborhood poverty rate among older suburbs was upward, as with rates for blacks, but the association with segregation is negative for whites, suggesting how greater degrees of segregation are associated with a reduced risk of white exposure to high poverty older suburb neighborhoods. Among newer suburb and rural/exurb locations, neighborhood poverty levels never surpass 15 percent at any point in time or level of segregation. White neighborhood poverty rates among all suburban locations have a negative (older suburb, rural/exurb) or essentially flat (newer suburb) association with racial segregation, with the results for black and white neighborhood poverty rates

cumulatively indicating how segregation is associated with greater racial inequality in exposure to neighborhood disadvantage in these suburban locations. Though white poverty rates trended upward over time in older suburbs, the average level is only comparable to black neighborhood poverty rates in older suburbs among metropolitan areas with the least extent of segregation (.2 for black-white metropolitan segregation).

2.6.4 Concentration of poverty

The final set of analyses using black-white segregation investigate the concentration of poverty across locations, with a comparable focus on differential change over time and salience of metropolitan segregation between cities and the types of suburbs. This outcome describes the degree to which the poor are segregated into poor neighborhoods, with results from these analyses informing the typical levels of this particularly deleterious circumstance across space, time and degrees of residential segregation. Table 2.5 displays coefficients from linear models of the poverty concentration in each location from 1980 to 2013-2017.

In Model 1, each of the suburban location types associated with lower concentration of poverty, though the coefficient for older suburbs is only about half the size of the other types' coefficients. The trends over time show a significant average increase, with levels in 2013-2017 greater than levels in 1980 by about 16 percent in absolute terms. Metropolitan black-white segregation is associated with a significantly greater level of poverty concentration across locations, though it is likely that important differences in the association between segregation and poverty concentration across spatial locations are washed out when considering the association as constant across space.

Table 2.5: Linear regression of concentration of poverty by location type, time period and metropolitan black-white segregation

	Model 1	Model 2	Model 3
Older Suburb	-0.220***	-0.258***	-0.021
	(0.016)	(0.021)	(0.097)
Newer Suburb	-0.441***	-0.410***	-0.013
	(0.014)	(0.017)	(0.075)
Rural/Exurb	-0.429***	-0.366***	0.144*
	(0.012)	(0.017)	(0.067)
Year=1990	0.074***	0.082***	0.103***
	(0.009)	(0.011)	(0.011)
Year=2000	0.034**	0.058***	0.088***
	(0.012)	(0.014)	(0.014)
Year=2010	0.130***	0.159***	0.202***
	(0.017)	(0.019)	(0.020)
Year=2015	0.157***	0.182***	0.225***
	(0.018)	(0.020)	(0.021)
Black-White Segregation	0.155†	0.164*	0.618***
	(0.081)	(0.080)	(0.104)
Log(Metro Total Population)	-0.066*	-0.066*	-0.067*
	(0.027)	(0.027)	(0.027)
Metro % Black	0.277	0.287	0.287
	(0.291)	(0.281)	(0.283)
Metro % White	-0.018	-0.008	-0.007
	(0.128)	(0.127)	(0.127)
Metro % Latino	0.357	0.375†	0.375†
	(0.218)	(0.214)	(0.217)
Older Suburb × Year=1990		0.041*	0.023
		(0.020)	(0.021)
Older Suburb × Year=2000		0.028	0.003
		(0.020)	(0.022)
Older Suburb × Year=2010		0.057*	0.021
		(0.025)	(0.029)
Older Suburb × Year=2015		0.062*	0.027
		(0.025)	(0.028)
Newer Suburb × Year=1990		-0.043**	-0.072***
		(0.015)	(0.016)
Newer Suburb × Year=2000		-0.031†	-0.072***
		(0.018)	(0.020)
Newer Suburb × Year=2010		-0.049*	-0.109***
		(0.020)	(0.022)
Newer Suburb × Year=2015		-0.033	-0.092***
		(0.021)	(0.023)
Rural/Exurb × Year=1990		-0.023	-0.060***
		(0.017)	(0.017)
Rural/Exurb × Year=2000		-0.077***	-0.131***
		(0.017)	(0.018)

Rural/Exurb × Year=2010		-0.103***	-0.181***
		(0.019)	(0.022)
Rural/Exurb × Year=2015		-0.107***	-0.184***
		(0.019)	(0.021)
Older Suburb × Black-White Segregation			-0.386**
			(0.145)
Newer Suburb × Black-White Segregation			-0.638***
			(0.112)
Rural/Exurb × Black-White Segregation			-0.823***
			(0.099)
Constant	1.242**	1.216**	0.946*
	(0.393)	(0.389)	(0.391)
Observations	4133	4133	4133
Metro Fixed Effects?	Yes	Yes	Yes
AIC	-2239.06	-2285.28	-2455.47
BIC	-2156.81	-2127.11	-2278.32

Standard errors in parentheses
† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Model 2 specifies location-specific trends over time for poverty concentration. Allowing differences in change over time between locations uncovers significant variation in trends among suburban locations. The relatively steepest increases over time in poverty concentration were among older suburbs, followed by cities. Both newer suburbs and rural/exurb locations experienced increases over time in poverty concentration too, though these trends were significantly shallower than those in cities and older suburbs. Like in Model 1, the association between black-white segregation and poverty concentration is positive, suggesting that more racially segregated metropolitan areas tend to have greater poverty concentration throughout all spatial locations.

Finally, coefficients from Model 3 specify an interaction between location types and metropolitan segregation. After introducing location-specific segregation associations, change over time follows a pattern of relatively comparable increases in poverty concentration among cities and older suburbs, with newer suburbs and rural/exurbs both showing significantly shallower upward

trends. Introducing the interaction between segregation and location types shows how cities have the strongest association between black-white segregation and poverty concentration, followed closely by older suburbs. The net association of segregation and poverty concentration for newer suburbs and rural/exurb locations is negative, implying that greater degrees of racial segregation tend to have a protective effect in terms of reducing the likelihood that poor households in these areas are exposed to neighborhood poverty as well.

Figure 2.6 presents the predicted concentration of poverty for each location in 1980, 2000 and 2013-2017. The concentration of poverty in city locations has a positive association with segregation such that there is about a 6 percent increase in poverty concentration associated with each .10 increase in segregation. Poverty concentration increased significantly, on average, from 1980 to 2013-2017, with the majority of poor populations within cities expected to reside in high poverty neighborhoods even among metropolitan areas with relatively lower levels of metropolitan racial segregation at the latest time period. Older suburbs had about half the level of cities' poverty concentration in 1980, but still had a modest positive association between metropolitan racial segregation and concentration of poor persons into high poverty neighborhoods. Specifically, an increase of about .10 in the level of metropolitan black-white segregation associated with about a 2 percent greater share of poor persons residing in a high poverty neighborhood among older suburbs.

In contrast to the dynamics observed with cities and older suburbs, the concentration of poverty in newer suburbs has changed little over time and is essentially unrelated to black-white segregation. Among newer suburbs and rural/exurb locations, the concentration of poverty remains largely at low

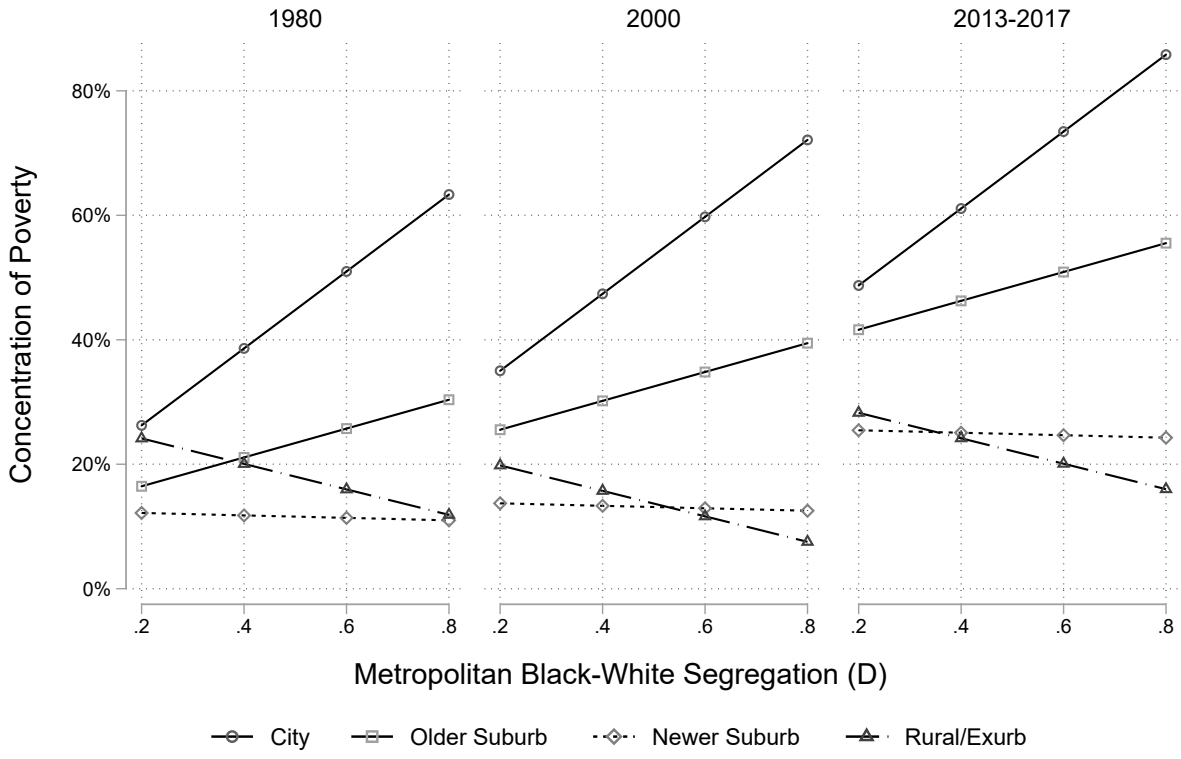

Figure 2.6: Predicted concentration of poverty for 1980, 2000 and 2013-2017 ACS by location type and metropolitan black-white segregation

average levels in absolute terms, as they were in 1980. This is particularly true in more segregated metropolitan areas, where the concentration of poverty remains around 20 percent for the 2013-2017 period. A relatively smaller share of poor persons in these areas (compared to cities and older suburbs) experience the twofold disadvantages of household and neighborhood poverty at the most recent observation, despite significantly greater overall prevalence of poverty concentration in metropolitan areas than in 1980. These estimates generally suggest that the poor population with greater white representation among these two suburban locations benefits from a protective

association of segregation with poverty concentration. This is in direct contrast to the segregation dynamics which increase the poor's exposure to high poverty neighborhoods among city and older suburb locations that typically have greater black and Latino representation.

2.6.5 Latino-white segregation, neighborhood poverty and poverty concentration

Additional analyses focused on understanding how Latino-white segregation is relevant to Latino neighborhood poverty rates and concentration of poverty across urban and suburban locations. These models provide important tests of whether Latinos' risk of exposure to neighborhood disadvantage in suburban neighborhoods is tied to the level of segregation Latinos experience in a metropolitan area, and whether this form of segregation is associated with exacerbated poverty concentration across spatial locations. Tables of regression coefficients and figures with adjusted predictions are available in Appendix B, but due to space limitations, I summarize the substantive conclusions here rather than reviewing the full model results.

Latino neighborhood poverty rates' average change over time and association with Latino-white segregation mostly mirrored the relationships observed with Black neighborhood poverty rates and black-white segregation. Specifically, levels have increased the most over time for city and older suburb locations, and metropolitan areas with greater degrees of Latino-white segregation associate with worsened Latino neighborhood poverty in both of these locations (though the city slope is about twice as steep than the respective slope for older suburbs). Trends over time were a modest increase in the Latino neighborhood poverty rate among newer suburb neighborhoods and no change among rural/exurb neighborhoods. The Latino neighborhood poverty rates for these locations had

a modest positive association of segregation with greater risk of exposure to neighborhood poverty like with older suburbs. These results suggest that Latinos moving to suburbs in more segregated metropolitan areas still face elevated risk of exposure to neighborhood disadvantage. Though most Latinos in suburban locations are expected to reside in a nonpoor neighborhood at the 2013-2017 ACS observation, the Latino neighborhood poverty rate among older suburbs in segregated metropolitan areas is trending towards 50 percent.

For the models of poverty concentration, the main difference between using black-white segregation and Latino-white segregation is that Latino-white segregation is associated with greater concentration of poverty in cities and newer suburbs, in contrast to older suburbs as with black-white segregation, though the concentration of poverty among newer suburbs remains low in absolute terms compared to cities and older suburbs. Latino-white segregation had essentially no relationship with the concentration of poverty among older suburb and rural/exurb locations. Overall, these models show that urban neighborhoods' concentration of poverty is much greater in metropolitan areas where Latinos and whites are segregated from each other, while farther-flung, newer suburbs tend to have modest increases in their poverty concentration based on the extent of metropolitan Latino-white segregation.

2.7 *Discussion*

These findings show how the risk of exposure to poor neighborhoods and concentration of poverty changed substantially since 1980. As suburbanization rose over time, older suburbs have come to resemble cities in terms of their levels of neighborhood poverty and poverty concentration. In

contrast, the evidence for newer suburbs and rural/exurb locations suggests relatively more modest change over time, with these locations still possessing relatively lower risks of exposure to high poverty neighborhoods and lower concentration of poverty.

While metropolitan areas generally saw increases in the share of their city and older suburb populations exposed to high poverty neighborhoods, the starkest levels and inequalities in neighborhood poverty rates in these locations currently exist within metropolitan areas with high degrees of racial/ethnic segregation. The results suggest that segregation has not changed in its association with poverty dynamics over time, though it has substantially different associations with these outcomes across different locations. In highly-segregated metropolitan areas, risk of exposure to high poverty neighborhoods and concentration of poverty in city and older suburb locations diverge substantially from those for newer suburbs and rural/exurb locations.

At the most general level, the empirical findings speak to how segregation associates with stratified trajectories of suburbanization by race and ethnicity. The present study's results contribute new evidence about differences in average neighborhood quality among suburban locations that black, Latino and white populations are likely to reside in, particularly as segregation increases. These differences matter insofar as heterogeneity between different suburban locations can contribute to new suburban forms of place-based disadvantage that will perpetuate broader socioeconomic inequalities by race and ethnicity over time. Older suburbs in particular are on a trajectory that implies greater similarity to cities in terms of there being greater prevalence of high poverty neighborhoods but also greater racial inequalities in the presence of segregation. While most neighborhoods in older suburbs are still not high poverty as of 2013-2017, this is partially related to segregation

associating with different neighborhood quality outcomes between black and white households amid a older suburb population that is still mostly white, on average.

There are some limitations to this study worth noting. First, the estimates of poverty concentration cannot directly speak to how much segregation specifically concentrates poor black and Latino households in poor neighborhoods, even if the measures of interest triangulate such a conclusion. Second, the analysis only directly considers the political boundaries of the principal cities and the urbanized area (which reflects the extent of incorporated and Census-designated places) when measuring different locations in metropolitan areas. Theory about suburbanization expects that more fragmentation in terms of municipal governance creates more opportunities for place-based stratification.

Future research should consider the household level mechanisms that underpin the poverty and segregation dynamics described in the present study. An important question is determining the relative difference in suburbanization pathways among black, Latino and white households of similar socioeconomic resources. Understanding trends in suburban residential mobility will accordingly inform the degree to which differences in exposure to high poverty neighborhoods reflects group differences in resources compared to residential disadvantages and segregated housing search processes.

Overall, this research affirms that the suburbanization of poverty is interacting with patterns of spatial inequality and segregation in important ways for understanding the geography of advantage and disadvantage in U.S. metropolitan areas. Higher levels of racial and ethnic segregation continue to associate with greater degrees of residential inequality, even as suburbanization has become more

common across race, ethnicity and socioeconomic status. Cities and older suburbs are on a trajectory of rising neighborhood poverty and poverty concentration, and in more segregated contexts this is corresponding to a stark contrast in residential conditions compared to newer suburbs and rural/exurb locations. In sum, patterns of racial and ethnic segregation may be changing to reflect greater suburbanization, but residential stratification remains an important mechanism upholding racial and ethnic inequalities in socioeconomic attainment.

Chapter 3

HOW SUBURBAN IS RACIAL SEGREGATION IN U.S. METROPOLITAN AREAS?

Black-white residential segregation remains a significant part of the social structure of many U.S. metropolitan areas. For example, the contemporary level in the Detroit-Warren-Livonia, MI metropolitan area implies that nearly three-quarters of the black and white populations would need to change neighborhoods in order to achieve integration across the metropolitan area[1]. About four decades ago in 1980, staggering levels of segregation meant that almost 90% of the population would have needed to move to integrate the metropolitan population across neighborhoods.

Average declines in racial segregation among U.S. metropolitan areas since the 1970s generated substantial scholarship trying to make sense of these trends, with accounts similar in empirical findings but varying somewhat in optimism about what these trends portended for the future of residential inequalities [13] [53] [29]. Relatively less consideration, however, has been given towards how the composition of segregation may have changed over time, perhaps in countervailing ways, across urban and suburban locations of metropolitan areas [19] [49].

Marked increases in the level of suburbanization across race, ethnicity and socioeconomic status since 1980 have direct relevance to the current form of segregation by making suburban populations more heterogeneous in sociodemographic composition, thereby blurring the traditional

[1]Author's calculations using the 2013-2017 American Community Survey 5 year estimates

city/suburb divide used to conceptualize how segregation operates across space [28] [87] [2]. As of the 2013-2017 ACS, the majority share of the black, Latino and white populations in U.S. metropolitan areas lived outside of central cities (i.e. within a suburb of some type), making a move to suburbs an increasingly likely trajectory regardless of household race or ethnicity. Most people among the metropolitan population with incomes below the Federal Poverty Line (FPL) now live in suburban neighborhoods too, with unevenness in their distribution leading to increases in the level of neighborhood poverty among some suburbs [2]. While the average level of neighborhood poverty among suburbs remains at a lower absolute level than the comparable estimate for city neighborhoods, there are now substantially more high poverty contexts among suburbs than just a few decades ago, with growth among suburbs outpacing cities.

Studies of residential segregation commonly treat cities and suburbs as a dichotomy when conceptualizing spatial differences in segregation, with the increasing heterogeneity in suburban neighborhoods noted above raising a question of how valid this conceptualization continues to be [61] [17] [19] [47] [50]. While existing research finds that levels of racial segregation overall in suburban areas are modestly lower than levels in central cities, there may be important gradations in the intensity of segregation that the conventional city/suburb conceptualization to spatial variation is blind to, with systematic differences in neighborhood characteristics differentiating more segregated suburbs from less segregated ones [59] [61]. The importance of racial and ethnic segregation for exposures to disadvantaged neighborhoods implies a growing need to test how much residential segregation changed across different suburban locations and to identify what changes in metropolitan composition were salient to differences in the location and intensity of suburban

segregation.

The present study advances the scholarship on metropolitan racial segregation to account for how this form of residential stratification has changed in composition across different urban and suburban locations amid greater rates of suburbanization among black and white populations. The empirical portion first describes the degree to which the share of metropolitan segregation attributable to separation among suburban neighborhoods has changed over time in order to understand how suburbanized segregation is in general. This informs how much separation within and between suburban locations increased or decreased over time, and whether changes in segregation reflect increased integration within neighborhoods or changing population distribution throughout metropolitan areas. I then model variations in black-white segregation within and between suburban locations to test the importance of different changes within metropolitan areas to differences in the suburbanization of segregation.

Through the Theil decomposition and modeling the suburbanization of segregation, the present study contributes new evidence about how segregation has become almost half-suburban in composition, with the most acute levels of suburban segregation among older suburbs but a rising share of overall segregation related to population transfers to more integrated newer suburbs. Further, the importance of segregation within and between the three types of suburban locations differs substantially among metropolitan areas based on how metropolitan population, employment and political compositions changed over time. On a general level, the present study encourages future research to go beyond the city/suburb dichotomy and engage with how segregation is not uniform across suburban space.

3.1 *Background*

3.1.1 Trends in racial/ethnic residential segregation

Metropolitan areas with high levels of racial segregation stem from different forms of discrimination against non-white households, both historical and contemporary [76]. Forces like redlining in credit markets, racially restrictive housing covenants, steering by real estate agents and outright violence against black households enforced a strict color line to satisfy white preferences for racial exclusion [21]. These dynamics contributed to a long-term increase in racial segregation from the turn of the 20^{th} century till around the 1970s when the Fair Housing Act of 1968 became law [13].

White suburbanization was a primary driver of racial segregation, with many suburbs homogeneous in composition from their inception because of policies enforcing racial exclusion. Further, some suburbanization was accounted for by a tendency of "white flight" to suburbs amid rising representation by black and other non-white households within the urban neighborhoods of metropolitan areas [10]. Post-WWII suburbanization during the second wave of the Great Migration was a process directly related to the increased diversity within central cities—each black arrival to a city corresponded by 2 or 3 white departures for the suburbs [3].

These trends substantially reshaped the geographic locations of white and black households in U.S. metropolitan areas. The high levels of segregation observed in the 1960s and 1970s led scholars to question whether U.S. metropolitan areas were forming a spatial divide, with the limits of a metropolitan area's principal city more or less as the organizing line for the separate social worlds which non-white and white households resided in [16]. Since 1970, segregation has been on

a trend of decline within U.S. metropolitan areas, related to improvements in neighborhood integration, increased levels of suburbanization among non-white households, and changing population flows between U.S. metropolitan areas favoring generally less-segregated Southern and Western metropolitan areas [88] [51].

3.1.2 Suburbanization and residential segregation

In 1950, about 40% of the average U.S. metropolitan population lived in suburban neighborhoods, with this figure trending to a level of almost 54% by 1970 [59]. This trend continued unabated, with overall suburbanization reaching almost 70% by 2000 [87]. Simply put, most people who live in U.S. metropolitan areas live within suburbs, and this has become true for the poor and nonpoor alike [2]. This trend stands in marked contrast to the conventional notion of suburbs as homogeneous in terms of socioeconomic composition, though there are important differences in the presence of poor households based on the housing stock of a suburb. Following the expectation that newer suburbs are more expensive due to their newer and larger housing stock, estimates from American Community Survey show that the share of poor persons within suburban neighborhoods drops off considerably among neighborhoods where the median housing unit was built within the past four decades.

Suburbanization has also become more common across racial and ethnic groups over recent decades. Historical rates of suburbanization between black, Latino and white households differed substantially due to discrimination throughout much of the 20th century. For example, in 1970, the the level of black suburbanization was about 25%, Latino suburbanization about 40%, and white

suburbanization about 65% [87]. Since 1970, Black and Latino suburbanization increased at a faster than average rate, reaching levels of about 45% and 55%, respectively, by the 2000 Census. These are still lower relative to the degree of white suburbanization, which stood at about 75% in 2000, but they nonetheless suggest improvements in neighborhood access and residential mobility in the decades following the passage of the Fair Housing Act of 1968.

Home rule is a defining feature of suburbs that historically created residential inequalities between black and white households through "opportunity hoarding", where efforts are made by one group to close off others' access to a valued resource like quality education [86]. With greater socioeconomic differentiation among suburban populations, home rule may also now contribute to segregation between suburban locations through municipal place-based disadvantages. Suburbs must draw enough tax revenue to provide some modicum of public services, with this fiscal constraint thus determined by the population, businesses and properties within a jurisdiction. Since there are finite development opportunities for building a stable tax base, suburban governments must compete against each other (and central cities) in terms of their effective taxation and package of public goods [85].

In the prototypical suburb with low levels of poverty and a upper-middle class composition, home rule allows the residents to pool their relative advantage in a exclusive capacity such that their municipalities can provide public goods that residents desire (e.g., public schools) at a high level and low relative cost [74]. In a poorer municipality, however, there may be difficulty at attracting new residents or employers that can substantially boost tax revenues, making home rule less advantageous and possibly burdensome compared to a more integrated structure of local

governance. More generally, competition between suburbs means providing thinner public services in domains that central cities might devote substantial budgets for (e.g., transit and homelessness services) in order to keep tax rates low, with this outcome preferable to falling behind economically as other locations solicit potential tax dollars to their area [52]. Municipalities with rising poverty may therefore avoid outlaying dollars to help poor households, either turning a blind eye to the problem or "free riding" off of services provided in cities, with either strategy potentially entrenching poverty over time [64] [14].

Overall, suburban home rule might only further disadvantage residents of locations with rising poverty in the presence of segregation, with political independence creating opportunities for additional differentiation between segregated suburban places as they must maintain their own systems of governance, local resources and tax structures [89]. For this reason, greater fragmentation in metropolitan areas may have relevance to the degree to which segregation is structured between different types of suburban locations.

3.1.3 Consequences of racial/ethnic segregation

High degrees of racial/ethnic segregation in a metropolitan area are directly associated with unevenness in neighborhood poverty between black and white neighborhoods, thereby raising black households' likelihood of residing in a high poverty context and experiencing associated neighborhood disadvantages [60]. Prior research informs of the wide variety of "neighborhood effects" associated with exposures to high poverty neighborhoods, including but not limited to, increased rates of crime victimization and worsened socioeconomic attainment over generations [77] [82]. Furthermore,

segregation is associated with exacerbated environmental inequality in U.S. metropolitan areas, serving to expose black households to elevated levels of air pollution and worsen health outcomes more generally [57] [90]. Overall, the wealth of literature on how racial segregation structures inequalities into metropolitan landscapes informs how the ramifications of this form of residential inequality are serious, and this is likely to remain the case whether a black household resides in a segregated urban or suburban neighborhood.

3.2 *Research Questions*

The existing literature leads the present study to the following three research questions related to suburbanizing segregation.

1. What is the composition of residential segregation within city and suburban locations among U.S. metropolitan areas, and how has this changed over time?

2. To what extent does suburbanizing segregation reflect increased integration within locations or changed population distribution between city and suburb locations?

3. What metropolitan characteristics related to differences in the extent to which segregation suburbanized?

3.3 *Data*

To analyze how the spatial composition of racial and ethnic segregation changed over time, I use a panel of census tract data based on the 1980, 1990, 2000 and 2010 decennial Censuses as well as the 2013-2017 American Community Survey (ACS) 5-year estimates. These data provide

estimates of the total population of each tract by race and ethnicity, and these counts form the basis for measuring the relative diversity and segregation in neighborhoods, locations and metropolitan areas. The Brown Longitudinal Tract Database (LTDB) facilitates spatially interpolating 1980, 1990 and 2000 Census estimates to the tract geography used for the 2010 Census [55]. This accordingly provides a set of tract-level data normalized to consistent geographic definitions over a period of nearly 40 years, avoiding potential biases related to changing spatial units over time.

I define metropolitan areas using the Census Bureau's concept of Core-Based Statistical Areas (CBSAs). CBSAs describe a region of high population and economic integration using one or more contiguous counties. The overall set of CBSAs is filtered to those with at least 50,000 persons and 5,000 non-Hispanic black population at each period of the analysis. These sample inclusion criteria are necessary given the present study's interest in metropolitan areas where residential segregation is reliably measurable and potentially a salient feature of the metropolitan residential landscape. Measuring residential segregation with the ACS is susceptible to bias when population counts are low, though this sensitivity of segregation measures is relevant in general too [65]. I also limit the analysis to the 153 metropolitan areas where each of the four location types were observed at each time period, which serves to exclude smaller CBSAs where, for example, there were either no older suburb neighborhoods or where a given location type had zero persons at some point in time. Imposing panel balance in terms of location types is necessary in order for the decomposition of average segregation to properly sum to the overall average level of metropolitan segregation. The resulting sample covers 153 metropolitan areas and their constitutive neighborhoods across the United States.

3.4 *Measures*

3.4.1 Location types

I use the measure of location types generated from the hierarchical cluster analysis with spatial constraints discussed in Chapter 2 to indicate whether a neighborhood is in a city or suburb. This measure identifies locations in metropolitan areas using four levels—that is, city, older suburb, newer suburb and rural/exurb. The conceptual difference between the suburban locations is in terms of their housing stock and density, though the suburban levels indirectly capture distance from the city center too, given their spatial distribution. These locations are a level of analysis in between neighborhoods (approximated by census tracts) and metropolitan areas (approximated by CBSAs). Having this meso-level proves to be useful for understanding how segregation is changing in magnitude within different regions of metropolitan space (e.g. the degree to which black and white households reside in relatively different neighborhoods of cities), in addition to potentially changing in overall structure (e.g. the degree to which black and white households reside in different locations of the suburban periphery).

3.4.2 Theil segregation index

Measures of segregation capture different dimensions of residential separation across metropolitan space, with the most commonly used measures describing how uneven neighborhood racial or ethnic compositions tend to be when compared to the overall composition of the metropolitan area [58]. Other dimensions of segregation exist, like exposure, but the vast majority of segregation

research focuses on the relative unevenness of neighborhood populations.

The Theil segregation index H is one measure of segregation in terms of unevenness with the unique property of being decomposable into parts for segregation within and between sub-units (in this case, location types) [73]. Segregation and integration can exist at different levels throughout a metropolitan area, with some spaces relatively segregated and others showing greater average levels of integration across race and ethnicity. Similarly, levels of segregation can change over time at different rates across locations in metropolitan areas. These dynamics are difficult to understand with a single summary of segregation. H can be interpreted as a measure of how diverse neighborhood populations are, on average, relative to the diversity of the metropolitan population [73]. Like other measures of evenness, H is reduced as neighborhoods become more integrated and representation of each group within neighborhoods becomes more comparable to what is observed in the overall metropolitan population.

Theil measures of segregation use the concept of population entropy to define the diversity of neighborhoods or the overall metropolitan area. Population diversity is related to equality of representation, and is a distinct notion from segregation, where the focus is the degree to which individual neighborhoods' compositions diverge from what would be expected based on the metropolitan composition. An entropy score E is computed using the following formula where r indexes n racial/ethnic groups being considered and p_r is the population proportion for group r in the area where entropy is being calculated:

$$E = \sum_{r=1}^{n} p_r \times log \frac{1}{p_r}$$

Entropy scores indicate no diversity at a value of 0, where one group accounts for the entire neighborhood population. Total diversity is reached at a maximum value of $log\,(n)$ when each of the n racial/ethnic groups has equal representation within the neighborhood.

The Theil segregation index is then computed using the population-weighted deviation of each neighborhood's diversity from the metropolitan area's diversity. Theil segregation indices can be computed with the following general formula where i indexes all k tracts, t_i denotes a given tract's population, T denotes the total metropolitan population, E denotes the metropolitan diversity and E_i denotes a given tract's diversity :

$$H = \frac{\sum_{i=1}^{k} \frac{t_i}{T} (E - E_i)}{E}$$

The resulting H measure ranges from 0 to 1, with values increasing as neighborhood populations become less diverse (i.e., more segregated) compared to the metropolitan area's overall diversity.

As mentioned, the Theil segregation measure H possesses the unique property of being additively decomposable, facilitating estimates of how much segregation occurs within and between the focal city, older suburb, newer suburb and rural/exurb location types. This makes it particularly ideal for the present study, since a key interest of this research is determining how segregation among suburban neighborhoods changed over time, as well as if white and black populations are becoming more or less segregated between particular suburban locations within metropolitan areas. Estimated components of segregation for a location can be interpreted by themselves (e.g. how diverse a set of neighborhoods are, on average, relative to the overall composition of the location;

how diverse a set of locations are, on average, relative to the overall metropolitan area) or as a share of metropolitan segregation (e.g., how much overall segregation would be reduced if a set of neighborhoods or locations were integrated).

Figure 3.1 displays the present study's strategy for decomposing segregation into components capturing the amount of metropolitan segregation that is attributable to segregation within each location type (city, older suburb, newer suburb, rural/exurb) as well as due to segregation between different spatial locations. The leftmost level of the tree diagram shows metropolitan segregation, which the second level decomposes into three components that together sum to the same overall H value. These components describe segregation within neighborhoods of cities in a metropolitan area, segregation within neighborhoods of the periphery (i.e., older suburbs, newer suburbs or rural/exurbs) in a metropolitan area, as well as the level of segregation attributable to differential population representation between the city and periphery areas. In this sense, segregation can increase due to white and black populations living in different neighborhoods within a given city (e.g., Philadelphia, PA) as well as through sorting into different spatial locations (i.e. black concentration within central cities amid "white flight" to peripheral locations of a metropolitan area).

The rightmost level of the tree diagram in Figure 3.1 describes the decomposition model used for addressing the present study's primary research questions. Two components remain the same as in the level of decomposition described by the middle level of the tree diagram—that is, there is still a component that measures segregation attributable to groups living within different urban neighborhoods of a metropolitan area, as well as a component describing how much segregation is

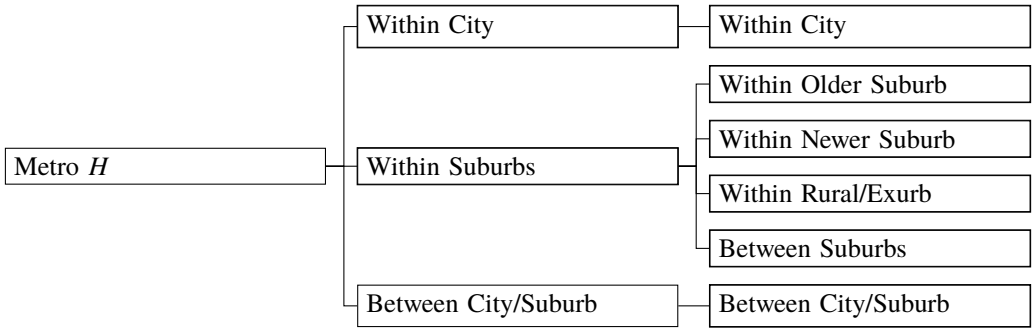

Figure 3.1: Diagram of Theil decomposition model for within- and between-location segregation

due to differential representation between city and suburban locations.

The main difference at the farthest level of decomposition is that the "Within Suburbs" component for segregation attributable to households living in different neighborhoods among suburban locations is additionally decomposed into parts for segregation among neighborhoods within each type of suburban location (i.e., older suburb, newer suburb and rural/exurb) as well as another component for segregation between these three locations outside of the central city. This between older suburb, newer suburb and rural/exurb component (henceforth, "between suburb") measures how much segregation could be reduced through integrating populations between different locations outside of cities, and therefore provides a metric about the degree to which older suburb, newer suburb and rural/exurb locations are differentiating from each other with respect to their population compositions and overall representation of black and white households. The expectation based on prior research and descriptive evidence of neighborhood compositions within each suburban location is that black households will be disproportionately represented in older suburb locations whereas white households will be disproportionately represented in rural/exurb locations.

3.4.3 Independent variables for models of segregation components

The set of measures used to understand differences in a given component of suburban segregation covers dimensions of metropolitan areas' demographic, political and economic compositions. First, I use a logged measure of metropolitan total population to understand differences in the composition of suburban segregation among metropolitan ares which were growing or shrinking from 1980 till the 2013-2017 ACS. The other demographic measures encompass racial and ethnic composition in order to analyze how metropolitan areas which became more diverse and "multi-ethnic" associated with differences in the composition of suburban segregation [23].

The next set of measures capture differences in suburban segregation associated with the degree to which there is political fragmentation in the metropolitan area, and the extent of suburbanization among the metropolitan population. The former is theoretically relevant to greater segregation between spatial locations, while the latter is relevant to how much segregation is possible among suburban locations to begin with. I follow a common operationalization of political fragmentation in prior research by measuring it with the number of census defined places per 1,000 persons [49].

The final set of measures identify whether changes in the economic base, or functional specialization (as it is sometimes referred to in studies of residential segregation), of metropolitan areas associated with substantial variations in the composition of segregation [15] [45]. The key dimensions of economic activity include the share of the population that is 65+ in age (to capture retirement/hospitality focused economies), the share of workers employed in manufacturing, the share of workers in the armed forces and the share of workers in public administration. These are relevant to the economic health of different locations in metropolitan areas, both cities and

suburbs included, with changes in the share of workers in manufacturing, for example, theoretically associated with changes in the structural position of cities and older suburbs based on the historical prevalence of such jobs in these areas.

3.5 *Analytic Strategy*

I start by describing the Theil decomposition of black-white segregation in U.S. metropolitan areas to address the first research question about the degree to which the spatial composition of segregation changed since 1980. I focus on the results for all metropolitan areas first, before turning to the subset of the largest 50 metropolitan areas and the 20 with the greatest segregation as of the latest time period. Within the context of the decomposition results, I share estimates of change in neighborhood segregation, total population and racial composition from 1980 to 2013-2017 to address the second research question. These characteristics describe the degree to which change in the absolute and relative size of segregation components reflected integration of neighborhoods over time within, for example, city neighborhoods, or transfers of persons to locations where the neighborhoods are relatively less segregated to begin with. These are important dynamics because a location could remain similarly segregated but experience population loss such that it contributes less to metropolitan segregation. Similarly, a location could experience no net change in population over time but become more integrated such that it has a smaller contribution to overall metropolitan segregation.

Once I finish describing the segregation decomposition results, I analyze the changes in metropolitan composition which were associated with differences in the suburbanization of segre-

gation in order to generate evidence for the third and final research question about the demographic, economic and political characteristics of places where segregation suburbanized to different degrees. These linear fixed effect models provide insight into the changes in population and housing characteristics of metropolitan areas associated with differences in the composition of segregation among suburbs. I include the other components of segregation as independent variables in order to understand how changes in segregation components throughout the metropolitan area (for example, segregation within cities) associated with differences in segregation among the suburban locations. These models are estimated with ordinary least squares, and include metropolitan (i.e. unit) fixed effects to adjust for time-invariant heterogeneity between different metropolitan areas. Variation over time is modeled using fixed effects for each time period. All models use robust standard errors clustered by metropolitan area to adjust for serial correlation of observations over time and heteroskedasticity in model errors.

3.6 *Results*

Table 3.1 displays the components of average black-white metropolitan segregation in the United States for each period from 1980 to the 2013-2017 ACS. This table also includes the share of overall segregation attributable to each component at each time period. These composition estimates can be interpreted as the amount of overall metropolitan segregation that would be reduced through integration of populations within the location's neighborhoods, or integration between the populations of the higher-level location types. A component's share of overall segregation can change due to increased or decreased segregation captured by the component of interest, or consistency in the

component amid change in the overall level of segregation for the metropolitan area.

As expected, the overall level of segregation among the average U.S. metropolitan area decreased by about 25% between 1980 and 2010, after which levels remained steady into the 2013-2017 ACS. The measure of metropolitan *H* suggests that black-white representation for the average neighborhood was about 30% less diverse than the composition of its metropolitan area in 2013-2017, reflecting average declines from levels of segregation in 1980. The remaining columns of Table 3.1 indicate total segregation attributable to residential separation within city neighborhoods, between city and suburban locations as a whole, and within and between different suburbs.

The column for total segregation related to black and white populations living in different city neighborhoods shows that this component declined from 0.22, or about 54% of all metropolitan segregation in 1980, to 0.10 by the 2013-2017 ACS. As of this most recent time period, segregation occurring within the city now accounts for about 34% of all metropolitan segregation in the average metropolitan area. Over the same period of time, the level of segregation that exists between city neighborhoods and the entire suburban periphery (i.e. Between City/Suburb column) declined slightly in terms of the component size, though it increased in its share of the overall composition of metropolitan segregation given this greater than average consistency over time. This makes sense, since most evidence points to some continued differences between black and white households in their level of suburbanization, even amid the trends of increased suburbanization overall. As of the latest time period, segregation at this location-level between city and suburbs stands at about 24%, or almost a full quarter of overall metropolitan segregation, up from 18% in 1980.

The remaining columns of Table 3.1 provide the total amount of metropolitan segregation

Table 3.1: Theil decomposition of average metropolitan black-white segregation

		Metro	City	Between City/Suburb	Suburbs				
		Total	Total	Total	Total	Older Suburb	Newer Suburb	Rural/Exurb	Between
1980	Component	0.40	0.22	0.08	0.11	0.05	0.02	0.02	0.02
	% share		53.54	18.98	27.48	11.46	4.64	5.67	5.72
1990	Component	0.37	0.17	0.08	0.11	0.04	0.02	0.03	0.02
	% share		47.29	22.07	30.63	11.06	5.65	7.34	6.58
2000	Component	0.34	0.14	0.09	0.12	0.04	0.03	0.03	0.03
	% share		40.60	25.07	34.34	10.62	8.00	8.01	7.70
2010	Component	0.30	0.11	0.08	0.12	0.03	0.03	0.03	0.03
	% share		35.01	25.91	39.08	10.25	10.71	9.59	8.53
2013-2017	Component	0.30	0.10	0.07	0.13	0.03	0.04	0.03	0.03
	% share		33.60	24.31	42.10	10.44	12.28	10.70	8.67

attributable to residential separation in the suburbs of the average metropolitan area, as well as the amount related to neighborhood separation within the three suburban location types and location-level separation between these suburb types. In the average metropolitan area, the component for total segregation related to the suburbs increased by .02 between 1980 and 2013-2017. Because of the declines in overall metropolitan *H* occurring over the same interval, the average metropolitan area's share of segregation related to the suburbs increased by about 15% in absolute terms, with suburban segregation accounting for a plurality of overall metropolitan segregation at the 2013-2017 ACS observation. For the specific suburban locations, there were somewhat different trends over time across the three suburban location types (i.e. older suburb, newer suburb and rural/exurb). Specifically, older suburbs saw a slight decline in their share of overall metropolitan segregation while the share attributable to neighborhood segregation within newer suburb and rural/exurb locations increased.

Figure 3.2 shows the average levels of segregation (using *H*), total population (in millions) and percent black overall and by location type for U.S. metropolitan areas, from 1980 to the 2013-2017 ACS. These three different measures provide insight into the degree to which in-place neighborhood integration and net transfers to less segregated locations contributed to the declines in segregation described above. The top panel of the figure displays how segregation within city, older suburb, newer suburb and rural/exurb locations changed over time. There was a steep decline in segregation within city neighborhoods, with neighborhoods about 40% less diverse, on average, than the level of diversity in cities as a whole in 1980, declining to a deficit of 27% by the 2013-2017 ACS. Though neighborhoods in older suburbs continue to have a relatively lower level of segregation than cities,

levels of segregation in older suburbs and cities have grown more similar over time due to shallower declines in *H* among these suburbs. In 1980, the average older suburb neighborhood was 26% less diverse than the overall population among older suburbs, and this declined only by 4% in absolute terms by the 2013-2017 ACS. Segregation among newer suburb and rural/exurb neighborhoods remained mostly flat over time, and though segregation remains at the lowest absolute level among these neighborhoods compared to those in cities and older suburbs, there was some evidence of an uptick in segregation between 2010 and the 2013-2017 ACS time points.

The bottom-left pane of Figure 3.2 shows trends in average total population size of metropolitan areas (in millions) and among the four location types over the same temporal extent. The average overall population size increased steadily over time, surpassing a level of one million persons in 2010. Notably, there are two distinct patterns within the location-specific trends—that is, substantial increase in suburbanization to newer suburb and rural/exurb locations amid steady decline among city and older suburb locations. While the average population size among newer and older suburbs was comparable in 1980, these two locations experienced near opposite trends in terms of population size over the period being analyzed. As of the 2013-2017 ACS, older suburbs were the least populous among the four types considered, while newer suburbs accounted for a slight plurality of the average metropolitan population. This pattern of change over time reflects the general trajectory of population suburbanization to newer, and generally more distant, suburbs and exurbs. However, trends in population size are only part of the story, with changing average racial composition relevant to differentials in rates of suburbanization to different locations.

Accordingly, the bottom-right pane of Figure 3.2 shows change over time in the black share of

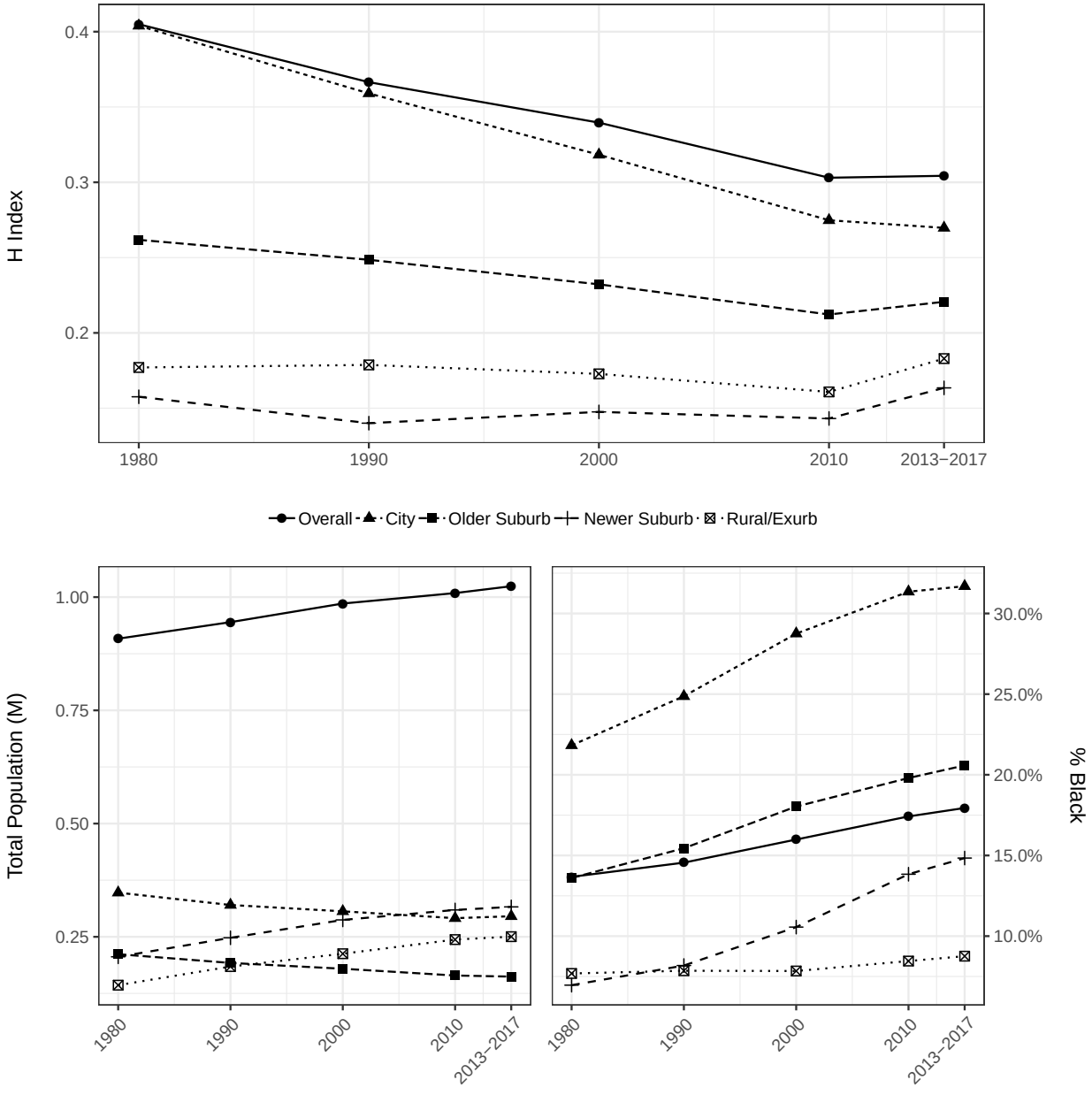

Figure 3.2: Average black-white segregation (top), total population (bottom-left) and percent black (bottom-right) for 1980 to 2013-2017 ACS by location type

the total population in each location. In 1980, the average black share among U.S. metropolitan areas stood at 14%, increasing by about 4% to 18% by the 2013-2017 ACS. City, older suburb and newer suburb locations saw greater than average increases in their black population share over the same period of time, with the average black share over 30% for the population within cities, over 20% in older suburbs and about 15% in newer suburbs. Compared to these three locations, the populations of rural/exurb locations remain overwhelmingly white in their racial composition, even after almost doubling in average population size over the same period (140K to 250K persons).

These population trends suggest that the majority of change in metropolitan segregation that reflected integration occurred within city neighborhoods. Nevertheless, the black share of city populations still tends to be considerably greater than the average for the metropolitan area (a little less than 50% higher in relative terms), explaining why the component for segregation of black and white populations between city and suburb locations did not change much, on average. Otherwise, the increased share of segregation attributable to separation within suburban locations did not reflect greater integration within neighborhoods relative to the average population of suburban locations, but rather greater representation among black populations within these locations. Among suburban locations, black representation among suburbs is higher than average in older suburb neighborhoods and considerably lower than average in rural/exurb ones.

Most of the metropolitan black population lives among the largest 50 metropolitan areas and segregation tends to be higher among older, larger metropolitan areas, so there is value in assessing how much the composition of segregation in these metropolitan areas differs from the overall decomposition. Table 3.2 presents estimates from a decomposition of average metropolitan seg-

regation for the 50 most populous metropolitan areas according to the 2013-2017 ACS. Like the results for all metropolitan areas, the level of overall segregation declined considerably between 1980 to 2013-2017. The average level of segregation is nonetheless modestly higher among larger metropolitan areas than among the overall population of metropolitan areas. Whereas the average neighborhood's diversity was about 50% lower, on average, than the diversity of the metropolitan area in 1980, this figure stood at 36% for the 2013-2017 ACS.

Trends in segregation within city neighborhoods show a greater decline over time than what was observed among the sample of all metropolitan areas, an observation partially driven by the relatively higher level of segregation within these neighborhoods in 1980 among the largest 50 metropolitan areas. The city share of all metropolitan segregation declined from a majority share of 57% in 1980 to 36% at the 2013-2017 ACS. As of the latest time period, though, it remains the single largest component of metropolitan segregation.

There is a great deal of consistency in the suburban components for the average among the largest 50 metropolitan areas when compared to the average among the 153 metropolitan areas considered in the overall sample. Again, the aggregate suburban trend in terms of a rising component level and sharply rising share of overall segregation reflects different forces at work—increased suburbanization overall, but some racial difference in the typical trajectories of suburban locations. The latter two types (newer suburb and rural/exurb) increased in component size and share of overall metropolitan segregation because they experienced essentially no change, or even a slight uptick, in segregation, but experienced substantial increases in total population.

In contrast, older suburbs saw increased diversity at the location level through a declining pop-

Table 3.2: Theil decomposition of average metropolitan black-white segregation for largest 50 metropolitan areas

		Metro	City	Between City/Suburb	Suburbs				
		Total	Total	Total	Total	Older Suburb	Newer Suburb	Rural/Exurb	Between
1980	Component	0.49	0.28	0.10	0.12	0.06	0.03	0.01	0.01
	% share		56.69	19.68	23.63	13.00	5.18	2.80	2.65
1990	Component	0.44	0.22	0.10	0.12	0.06	0.03	0.02	0.02
	% share		50.16	22.34	27.50	12.76	6.93	3.89	3.91
2000	Component	0.41	0.18	0.10	0.14	0.05	0.04	0.02	0.02
	% share		42.98	23.53	33.49	12.93	10.77	4.55	5.25
2010	Component	0.36	0.14	0.08	0.15	0.05	0.06	0.02	0.02
	% share		37.47	21.15	41.37	13.19	15.32	6.06	6.80
2013-2017	Component	0.36	0.13	0.07	0.16	0.05	0.06	0.03	0.03
	% share		36.20	19.19	44.61	13.59	16.87	6.89	7.26

ulation and increased black share due to whites moving to other locations at a greater rate (trends which made the overall level of diversity in older suburbs closer to the average among neighborhoods). The level of segregation within these neighborhoods declined at a lower than average rate over the same period of time (-11% vs -26%), about half the relative change experienced within cities (-29%). These factors cumulatively served to keep the older suburb share of metropolitan segregation at a level in 2013-2017 that was comparable to 1980. Overall, the result of these different trends across suburban locations was a large increase in the total suburban share of metropolitan segregation, from about 24% to about 45%.

Differences in the rate of suburbanization to the three location types among white and black households are relevant to the rising contribution of between suburb segregation among largest 50 metropolitan areas. At the latest time period, the between suburb segregation component accounted for about 7% of overall metropolitan segregation, over twice this component's share in 2013-2017. Combined with only minimal change over time in the between city/suburb component of metropolitan segregation, there is more macro-level segregation (as a part of all segregation) than at any point observed in this study.

Table 3.3 presents metro-specific decompositions of segregation for the most segregated 20 metropolitan areas according to the 2013-2017 ACS[2]. These metropolitan areas remain highly segregated, with neighborhoods about 50% less diverse than the overall metropolitan area, on average. In 1980, the average H among these metropolitan areas was .60, so the 2013-2017 estimates represent a decline of about 17% relative to this prior period.

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[2]For reference, a comparable set of 1980 estimates for these 20 metropolitan areas is available in Appendix C.

Changes in the overall level of segregation and extent of suburbanization of these metropolitan areas have corresponded with a changing composition of segregation. At the time of the 1980 Census, half of these highly-segregated metropolitan areas had the majority of their residential segregation within the neighborhoods of their principal cities alone. Save two exceptions, the majority of these metropolitan areas' 1980 segregation composition was accounted for by segregation existing within cities (i.e. between different neighborhoods of a city) and by segregation of black population within city neighborhoods and white population within suburban locations. The composition of segregation across these metropolitan areas for the 2013-2017 ACS, however, is much more varied. In three cases (i.e., Milwaukee-Waukesha-West Allis WI, New York-Newark-Jersey City, NY-NJ-PA and New Orleans-Metarie-Kenner, LA), the 2013-2017 ACS share of segregation attributable to city neighborhoods remains over 50% of all segregation. What is more common now, though, is for the component for segregation within city neighborhoods to be the single largest component, with this component about as large as the suburban components combined. Overall, these results indicate that neighborhood diversity in the cities of these metropolitan areas is still substantially lower than it should be (relative to the city population composition), but also that suburbanization has meant greater variation in the depth and typical locations of black-white segregation.

In a similar vein, the emergence of majority-suburban segregation within neighborhoods follows as a trend opposing the decline of majority-city segregation. While only 2 out of the 20 metropolitan areas had a majority of their within-location segregation among the suburban locations in 1980, this became much more common over time—the most recent estimates show about half of these

Table 3.3: Theil decomposition of 2013-2017 ACS metropolitan black-white segregation for 20 most segregated metropolitan areas

	Metro H	Within % of Overall				Between % of Overall		Majority Suburb?	
Metropolitan Area	Total	City	OS	NS	Rural	City-Suburb	Suburbs	Within	Between
Milwaukee-Waukesha-West Allis, WI	0.61	50.21	1.93	7.44	0.77	37.76	1.88		
New York-Newark-Jersey City, NY-NJ-PA	0.59	51.66	19.83	9.40	0.88	14.72	3.51		
Chicago-Joliet-Naperville, IL-IN-WI	0.59	40.43	20.43	13.52	1.61	13.94	10.06		
Detroit-Warren-Livonia, MI	0.57	24.55	18.01	10.04	2.26	39.64	5.49	✓	
Cleveland-Elyria-Mentor, OH	0.54	21.21	25.59	10.09	1.89	20.80	20.42	✓	
Buffalo-Niagara Falls, NY	0.53	37.62	8.02	1.63	4.11	46.72	1.91		
St. Louis, MO-IL	0.52	12.33	33.73	17.09	2.44	12.64	21.77	✓	✓
Niles-Benton Harbor, MI	0.50	24.98	4.86	11.93	17.49	21.63	19.11	✓	
Flint, MI	0.48	34.84	9.40	0.85	11.81	39.43	3.67		
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	0.48	32.69	18.38	7.22	5.54	31.36	4.80		
Los Angeles-Long Beach-Santa Ana, CA	0.47	40.50	33.55	16.85	0.85	3.18	5.07	✓	✓
Peoria, IL	0.46	32.00	5.46	1.23	5.55	53.63	2.13		
Saginaw-Saginaw Township North, MI	0.46	21.76	4.89	1.12	34.37	28.20	9.66	✓	
Dayton, OH	0.46	35.20	3.39	26.39	6.04	21.47	7.50	✓	
Beaumont-Port Arthur, TX	0.44	28.95	8.68	5.64	11.93	37.79	7.01		
New Orleans-Metairie-Kenner, LA	0.44	55.99	7.34	4.69	20.88	8.00	3.10		
Baltimore-Towson, MD	0.44	28.15	11.66	22.06	3.87	23.96	10.30	✓	
Miami-Fort Lauderdale-Pompano Beach, FL	0.44	14.72	32.60	44.06	2.21	0.37	6.05	✓	✓
Birmingham-Hoover, AL	0.44	27.22	9.22	15.69	10.43	22.88	14.57	✓	
Bridgeport-Stamford-Norwalk, CT	0.43	37.12	11.34	4.54	1.67	42.39	2.95		

metropolitan areas now have such a composition to their metropolitan segregation. While there were only three metropolitan areas among this group with majority-suburb between-location segregation in 2013-2017, this is still up from 1 metropolitan area in 1980 and mirrors the near-doubling of this component's share of metropolitan segregation observed among the largest 50 metropolitan areas. Suburbs are differentiating as more and more of the population settles in these locations, with segregation of black and white populations increasingly happening between older suburbs, newer suburbs and rural/exurb locations.

3.6.1 Multivariable analysis

The remaining analyses assess the metropolitan characteristics associated with differences in the suburbanization of residential segregation. Measures encompassing change over time, the extent of segregation elsewhere in the metropolitan area, and characteristics of metropolitan areas' demographic, municipal and economic compositions are the basis for examining patterns of segregation within and between different suburban locations. While it is common to look at one unit differences in a given predictor when interpreting linear regressions, this approach to interpreting fixed effect regression results can lead to misleading conclusions if the general trends observed within metropolitan areas were net declines, or even just small increases [62]. Since estimated coefficients are based on within-metropolitan area change over time, I accordingly discuss average trends in metropolitan characteristics where relevant to inform interpretation of the focal models.

I present regression coefficients from both restricted (odd-numbered) and fully-specified (even-numbered) models, where each restricted specification models the average change over time in

a given suburban component of segregation, and each full specification tests characteristics of metropolitan areas' populations, political structures and economic bases that are theoretically related to differences in suburban segregation within a given metropolitan area.

Within Older Suburb

Columns for Models 1 and 2 in Table 3.4 provide coefficients from regressions explaining variation in the component of segregation capturing how much black and white households reside in different neighborhoods within older suburbs. There was a significant decline in older suburb components, on average, from 1980 till the 2013-2017 ACS observation based on coefficients from Model 1, and this trend remained significant in Model 2 after adjusting for the degree of segregation elsewhere in the metropolitan area and metropolitan characteristics relevant to patterns of segregation.

Coefficients for the other components of segregation indicate that increases in segregation within rural/exurb neighborhoods associated with reductions in segregation occurring within older suburbs neighborhoods. An important dimension to this relationship is the relatively greater segregation among older suburban neighborhoods that the model predicts in contexts when the rural/exurb component did not experience the average small increase over time, that is, if a rural/exurb area kept a relatively more homogeneous white composition. Segregation within older suburbs did not significantly differ based on the degree of segregation within other locations or the level of segregation between locations, suggesting that there is otherwise some consistency in this feature of metropolitan segregation even as segregation varies in composition elsewhere in the metropolitan area.

The remaining independent variables in Model 2 test how metropolitan population composition, political structure and employment characteristics associate with differences in the composition of suburban segregation. Increases in the size of a metropolitan area's population (i.e., growing metropolitan areas) tended to associate with lower levels of older suburb segregation, and similarly, metropolitan areas with declining populations associated with greater segregation attributable to black and white households residing within different older suburb neighborhoods. As might be expected, greater suburbanization of metropolitan populations associated with greater segregation among older suburb neighborhoods.

Increases in the metropolitan share of workers employed in manufacturing associated with lower levels of older suburb segregation, though given the general trend of this component declining over time, a potentially more appropriate interpretation is that greater declines in the metropolitan share of workers employed in manufacturing corresponded to greater segregation among older suburbs. Similarly, differences in the share of workers employed in public administration associated with significant variation in older suburb segregation. One relevant example is Washington-Arlington-Alexandria, DC-VA-MD-WV: greater than average declines over time in the share of all workers in public sector jobs associated with greater importance of older suburbs to the overall composition of metropolitan segregation.

Within Newer Suburb

Models 3 and 4 investigate differences in the component of segregation that captures how much black and white households reside in different neighborhoods among newer suburbs. Model 3

Table 3.4: Linear fixed effects models of suburban metropolitan segregation components

	Older Suburb		Newer Suburb		Rural/Exurb		Between Suburb	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Period								
1990	−0.006***	−0.012**	0.002**	−0.005*	0.004**	0.005†	0.001	0.001
	(0.001)	(0.004)	(0.001)	(0.002)	(0.001)	(0.003)	(0.001)	(0.003)
2000	−0.010***	−0.020**	0.008***	−0.006	0.004*	0.006	0.003*	0.006
	(0.002)	(0.007)	(0.001)	(0.004)	(0.002)	(0.005)	(0.001)	(0.005)
2010	−0.015***	−0.029**	0.014***	−0.011†	0.006**	0.004	0.003	0.005
	(0.003)	(0.010)	(0.002)	(0.006)	(0.002)	(0.007)	(0.002)	(0.007)
2013-2017	−0.015***	−0.027*	0.019***	−0.008	0.010***	0.006	0.003	0.009
	(0.003)	(0.012)	(0.002)	(0.007)	(0.002)	(0.008)	(0.002)	(0.008)
Components of Metropolitan H								
City		0.001		−0.038		−0.003		−0.062†
		(0.035)		(0.028)		(0.026)		(0.036)
Older Suburb				−0.064		−0.151†		0.082
				(0.061)		(0.080)		(0.066)
Newer Suburb		−0.132				−0.275**		−0.160*
		(0.119)				(0.099)		(0.075)
Rural/Exurb		−0.235*		−0.208**				−0.284**
		(0.113)		(0.078)				(0.102)
Between City-Suburb		−0.046		−0.269***		−0.215***		−0.222***
		(0.053)		(0.043)		(0.047)		(0.040)
Between Suburbs		0.122		−0.116†		−0.272†		
		(0.110)		(0.062)		(0.143)		
Metropolitan Context								
Log(Metro Total Population)		−0.043*		−0.012		−0.013		−0.009
		(0.021)		(0.010)		(0.012)		(0.007)
Metro % Non-Latino Black		−0.071		0.088		0.059		−0.003
		(0.088)		(0.064)		(0.094)		(0.071)
Metro % Latino		0.062		0.113**		0.078		−0.022
		(0.074)		(0.035)		(0.056)		(0.032)
Metro % Asian/Pacific Islander		0.080		0.097†		0.005		0.066
		(0.074)		(0.053)		(0.047)		(0.051)
Political Fragmentation		−0.032		−0.035		0.281†		0.439*
		(0.237)		(0.156)		(0.168)		(0.175)
% Suburbanized		0.199*		0.134***		0.108**		0.026
		(0.100)		(0.035)		(0.039)		(0.031)
% Elderly		−0.040		−0.021		0.108		−0.067
		(0.139)		(0.074)		(0.077)		(0.077)
% Manufacturing		−0.086*		−0.027		−0.003		−0.025
		(0.037)		(0.024)		(0.031)		(0.034)
% Military		−0.002		0.112		0.095		−0.131
		(0.126)		(0.102)		(0.134)		(0.095)
% Public Administration		−0.206*		−0.042		0.021		−0.038
		(0.096)		(0.085)		(0.125)		(0.080)
N	765	765	765	765	765	765	765	765
Includes Metro Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.143	0.354	0.292	0.570	0.074	0.280	0.011	0.294

† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

coefficients indicate significant increases in the average level of segregation among newer suburbs from 1980 to the 2013-2017 ACS, consistent with the descriptive findings. This significant change over time was accounted for in a model where only period fixed effects and measures of metropolitan total population and racial/ethnic composition are included, suggesting how trends of increasing representation of Latinos and Asian/Pacific Islanders since 1980 were most salient to variations in newer suburb segregation observed in more recent years.

The components for segregation within rural/exurb neighborhoods and both types of segregation between locations had inverse relationships with segregation among newer suburbs. Given the average .01 increase in rural/exurb segregation from 1980 to the 2013-2017 ACS, this first coefficient suggests that metropolitan areas which experienced the average trend saw a modest decline in newer suburb segregation as rural/exurb segregation increased. Decreases in segregation of black and white populations between city and suburban locations associated with rising segregation among newer suburb neighborhoods, implying that the metropolitan areas where the city/suburb divide blurred the most over time (with respect to segregation) had countervailing increases in segregation among more recently developed suburban neighborhoods. In contrast, increases in segregation between different suburban locations associated with declining segregation among newer suburbs. Overall, these results describe how newer suburbs vary substantially in their segregation based on a.) how much white populations continue to be disproportionately represented among rural/exurb neighborhoods and b.) the degree to which segregation still follows a city/suburb division and c.) the degree to which there is segregation between different types of suburbs. In some newer suburbs contribute more to overall segregation through white and black households residing in

different neighborhoods; in others, more stratified patterns of suburbanization imply that these areas are mostly white, with older suburbs the location where black households are disproportionately represented.

There were two sets of metropolitan characteristics salient to differences in newer suburb segregation. First, metropolitan areas with growing Latino and Asian/Pacific Islander representation tend to have greater segregation among newer suburb neighborhoods. This suggests that in metropolitan areas where the overall population is increasingly "multi-ethnic," including among the suburban locations, black populations tend to live in different newer suburb neighborhoods than whites to a greater degree, with the expectation being that both Latinos and Asian/Pacific Islanders are relevant to the composition of neighborhoods that black and white households reside in. The other characteristic determines how much segregation is possible among suburb, with the overall suburbanization of metropolitan populations associated with significant differences in segregation within newer suburbs as with older suburbs.

Within Rural/Exurb

Models 5 and 6 assess differences in the component of segregation that captures how much black and white households reside in different neighborhoods among rural/exurb locations. Model 5 shows a significant increase over time in the level of segregation related to neighborhoods in rural/exurb areas, though this trend is mostly accounted for in Model 6 when the full set of measures for metropolitan segregation and composition are included.

Differences in segregation within rural/exurb locations of metropolitan areas are inversely re-

lated to change over time in degree of segregation elsewhere in the metropolitan area based on the significant negative coefficients for older suburb, newer suburb, between city-suburb and between suburb segregation. The implication is that segregation of black and white households between rural/exurb neighborhoods becomes less salient to overall segregation as these other components increase in size, which was the general trend for newer suburb segregation and between suburb segregation. Older suburb segregation and between city-suburb segregation both experienced average declines over time, with this mean trend corresponding to increases in rural/exurb segregation for metropolitan areas. For metropolitan areas where older suburbs remain more segregated or central city limits remain an important spatial divide for segregation, neighborhoods within rural/exurb locations are expected to have lower levels of segregation. This demonstrates how neighborhoods in a location can have high average levels of diversity when minority representation in the overall area is low, with such a location then more relative to segregation between locations.

Like the other components of segregation discussed thus far, there is a direct relationship between the overall level of suburbanization and the degree of segregation attributable to residential separation within rural/exurb locations. Otherwise, the other salient characteristic of metropolitan areas for differences in rural/exurb segregation was the degree of political fragmentation in the metropolitan area, with more fragmented metropolitan areas theoretically facilitating greater segregation between suburban areas through some municipalities' capacity to zone land use and more generally resist multifamily housing developments.

Between Suburbs

Columns for Models 7 and 8 provide coefficients explaining differences in the component of segregation that captures how much black and white households live in different suburban areas, that is, the degree to which black and white populations are segregated between older suburb, newer suburb and rural/exurb areas. The non-significant coefficients for change over time in the both Models 7 and 8 indicate that the weak upward trend in segregation between suburbs described at the beginning of the results was not a consistent trend among the sample of all metropolitan areas. Changes over time in the other components of segregation and a key dimension of the political structure of metropolitan areas were otherwise more relevant to variations in segregation between suburb locations.

First, greater declines in segregation among city neighborhoods over time associate with larger increases in the degree to which black and white populations differentiated between suburban locations. This suggests where integration increased the most among city neighborhoods (i.e. declines in city segregation were greater than average), suburban locations tended to become relatively more segregated by race between types of suburbs and their associated housing mix. Notably, only between suburb segregation was sensitive to these changes in segregation among city neighborhoods. In metropolitan areas with greater segregation among newer suburbs and rural/exurb locations there is relatively less segregation between suburbs, suggesting how segregation between suburbs does not tend to exist at high levels when there is relatively greater segregation between neighborhoods among farther flung locations.

Otherwise, the only salient feature of metropolitan contexts to the degree of segregation between

locations was the level of political fragmentation in the metropolitan area. Political fragmentation generally declined over time among metropolitan areas because population growth outstripped new incorporations in most metropolitan areas, implying that metropolitan areas following this trend tend have a slightly lower level of segregation between suburbs. In contrast, the metropolitan areas where this remained steady over time, over even increased, are expected to be where between suburb segregation is relatively more acute.

3.7 *Discussion*

This study contributes new evidence about how much segregation has suburbanized across different urban and suburban locations, along with the characteristics of metropolitan areas where segregation has suburbanized to varying degrees. First, it is evident that the declines in metropolitan segregation that scholars have written substantially about have dovetailed with a significant re-configuring of black-white segregation's typical spatial form. Neighborhoods are generally less segregated now than in 1980, but there remain relatively more segregated locations (i.e., city and older suburb) even as suburbanization increased the share of all persons living in newer suburbs or rural/exurb locations and decreased the level of segregation between city and suburban locations. A consequence of increased suburbanization and improvements in neighborhood integration among city neighborhoods has been that the share of metropolitan segregation attributable to unevenness in neighborhood compositions within suburban locations, as well as the share attributable to separation between different suburban locations, increased to about 40% of overall metropolitan segregation, on average. About half of the 20 most segregated metropolitan areas at the most recent period of

data have more segregation related to uneven neighborhood diversity among suburban locations than the respective component for their central cities. Overall, an increasing share of segregation measures like H or the index of dissimilarity describes residential separation in forms other than the city/suburb lens that racial segregation has commonly been viewed through, with implications for how scholars and practitioners conceptualize the locations of racial residential inequality in U.S. metropolitan areas.

There were important differences in the suburbanization trajectories of black and white households relevant to how segregation has suburbanized across spatial locations of a metropolitan area. For example, black households moving to older suburbs at a greater rate than whites (and perhaps simultaneously, whites have been leaving at a greater rate than blacks) offset the weaker-than-average declines in H among older suburb neighborhoods, trends which cumulatively meant the share of segregation attributable to older suburbs remained fairly steady over time. In contrast, newer suburb and rural/exurb locations experienced a large increase in their share of metropolitan segregation due to a substantial increase in the share of metropolitan populations living in these locations. Segregation between suburban locations trended upward among the largest 50 metropolitan areas but not significantly so among all metropolitan areas, indicating how black and white households continue to live in different spatial locations of the largest metropolitan areas where segregation is most acute, even though this may be increasingly accounted for by residing in different locations between suburbs rather than between the city and the suburban periphery (as a whole). Differences in the level of segregation within and between suburban locations were explained largely by differences in the other components of segregation, metropolitan population composition and features

of metropolitan social structure. The only significant trends net of these factors were the average modest declines in older suburb segregation.

The other components of segregation, population composition and metropolitan structure were generally relevant to differences in the suburbanization of residential segregation, though the only consistent association across all components was that more suburbanization among the overall metropolitan population associated with more suburban segregation, as might be expected. Otherwise, there were unique metropolitan compositions associated with differences in the four suburban segregation components considered in the multivariable analysis. This suggests a wide range of variation in the forms of suburban segregation based on changes in the broader metropolitan context. For example, metropolitan areas which experienced weaker than average increases in rural/exurb segregation tended to have higher levels of segregation among older suburbs, while declining segregation between the city and suburbs was offset by an association with greater segregation between suburban locations. Steeper declines in manufacturing sectors partially washed out the average declines in older suburb segregation, and greater levels of political fragmentation tended to associate with more between suburb segregation of black and white populations. Finally, metropolitan areas with greater representation of Latinos, Asians and Pacific Islanders tended to have more newer suburb segregation, an observation suggesting how black and white households are more likely to share newer suburban neighborhoods with these other groups than each other in so-called "multi-ethnic" metropolitan areas.

There are a couple of important limitations to the present study. First, this study only considers the composition of metropolitan black-white segregation and accordingly cannot contribute insights

into how Latino-white, Asian-white and other forms of segregation may have suburbanized in different ways from 1980 to the 2013-2017 ACS. Further, the overall sample used in this study includes only 153 out of 231 metropolitan areas with populations large enough to reliably study segregation. Future research should seek to understand other forms of racial and ethnic segregation and extend research to account for smaller metropolitan areas in order to provide the most complete picture of suburban residential stratification within the United States.

The findings of this study show how differences in housing stock between suburban locations are relevant to rising segregation within some suburban locations as well as generally greater segregation between the three focal types. Though the differentiation between suburbs necessitates a more complicated depiction of the spatial segregation in U.S. metropolitan areas, differences in zoning, transit availability and housing unit affordability between locations in the suburban periphery are a useful way to organize the different outcomes that black and white households tend to have when moving among suburban neighborhoods. This perspective provides insight into how there are important gradations in segregation throughout metropolitan areas, with some suburbs becoming more comparable to cities in their level of segregation over time and others varying substantially in their segregation and contribution to overall segregation based on characteristics of the broader metropolitan context.

Overall, racial segregation is changing as the United States continues to become a more suburban population. Scholars and policymakers must calibrate how they talk about segregation and residential inequality to this new normal in which most people reside outside of central cities, and segregation increasingly exists outside of these locations too. Improving integration across

neighborhoods in suburbs and cities alike will reduce disparities in exposure to neighborhood poverty, mitigate inequalities in terms of funding for municipal institutions like public schools and transportation, and generally lead to a more equitable future for U.S. metropolitan areas.

Chapter 4

THE DYNAMICS OF BLACK-WHITE INEQUALITY IN EXPOSURE TO POOR URBAN AND SUBURBAN NEIGHBORHOODS: RESIDENTIAL MOBILITY AND IN-PLACE NEIGHBORHOOD CHANGE

Residential segregation between black and white households remains at high levels in many metropolitan areas [51]. This form of residential inequality is associated with exacerbated black-white inequality in exposure to poor neighborhoods and was created through mechanisms like historical discrimination against non-white households in credit and lending markets [60] [76]. Though *de jure* discrimination was outlawed by the Fair Housing Act of 1968, segregation is nonetheless sustained and recreated by contemporary, less overt forms of discrimination and the fact that prior experiences of segregation structure how households search for housing [43]. For decades, segregation has meant that black households have been more likely to move to high poverty neighborhoods, and less likely to exit them, net of household characteristics like socioeconomic status [12]. Neighborhoods with high prevalence of poverty are associated with disadvantages like higher crime rates and weaker availability of employment opportunities, with the "neighborhood effects" associated with neighborhood disadvantage accordingly a mechanism by which racial segregation contributes to the reproduction of inequalities between black and white households in outcomes like socioeconomic attainment over generations [78] [82].

Through much of the 20th century, suburban locations in metropolitan areas were a place of

racial exclusion given the legal and extralegal barriers to suburban residential mobility that black households faced [59]. At the height of segregation around the 1970s, scholars observed that there was a growing spatial divide in the structure of U.S. metropolitan areas between the central city where black households resided and the suburban periphery where most white households had come to reside [16]. With white households expressing a preference for racially homogeneous suburban neighborhoods, suburbanization was a process partially rooted in "white flight" from integrating neighborhoods [10]. The constrained residential mobility open to black households resulted in the concentration of poverty within the central city neighborhoods of many metropolitan areas, as losses accrued in terms of blue-collar employment opportunities and public service funding for central cities. Overall, these trends contributed to suburbs' advantaged structural position and the deteriorating position of central cities, where neighborhood disadvantage and concentrated poverty became increasingly prevalent and remain at relatively high levels in the present day [33] [2].

Since the passage of the 1968 Fair Housing Act, moves to suburbs have become more common across race and socioeconomic status. On the one hand, this represents improvements in residential integration and is reflected in the modest declines in segregation noted across multiple studies [13] [53]. Still, neighborhood segregation among suburbs is still relatively high, and segregation within and between different suburban jurisdictions is a growing part of overall segregation [61] [49]. These trends suggest how increased suburbanization has been accompanied by some improvements in integration but also new suburban forms of residential segregation.

An important related trend is the emergence of high poverty neighborhoods among suburban locations. While there are still fewer high poverty neighborhoods within suburbs than within cities,

the trends over time suggest that this difference is closing [2]. These high poverty neighborhoods are disproportionately located among older, inner-ring suburbs, built in the immediate construction boom following WWII. While the population living among suburbs is majority white, black and Latino households are overrepresented in the composition of suburban high poverty neighborhoods [27]. This observation suggests there is stratification in suburbanization pathways relevant to observed inequalities in exposure to high poverty neighborhoods. However, an important unresolved question based on these aggregate findings is whether black and white households have comparable suburbanization trajectories (in terms of moving to a poor/nonpoor neighborhood), net of household characteristics salient to mobility outcomes. Beyond this primary mobility dynamic, other research about poverty suburbanization has noted a potential for households to become poor in place in terms of the presence of household poverty in some locations like older suburbs due to the lack of economic opportunities and social service provision [64]. This potential trajectory of change in household poverty raises an important question about whether segregation exacerbates this household level dynamic by relating to differences in the likelihood of a *neighborhood* becoming poor in place, even adjusted for household socioeconomic composition.

The present study assesses the household dynamics that account for the black/white disparity in exposure to high poverty neighborhoods across urban and suburban locations. An important first step is to empirically describe how black and white households' residential destinations changed over time as suburbanization increased in order to inform whether black and white households of comparable household composition continue to have differences in the typical locations they move to. The remainder of the study documents two mechanisms generating inequality in exposure to

neighborhood poverty—disparities in mobility to high poverty contexts and in-place neighborhood change. Accordingly, the second of the three focal outcomes tests how the black/white disparity in moves ending in high poverty neighborhoods changed over time, whether the disparity varied across suburban and urban destinations, and how much outcomes differed in the presence of higher degrees of segregation. Then, the final outcome focuses on whether black households moving to a nonpoor neighborhood are more likely to experience it become high poverty within a period of four years, an analysis designed to capture inequality in the relative trajectories that the destination neighborhoods of black and white households are on when moving to urban and suburban locations.

While trends in suburbanization have been explored in various ways with aggregate Census data, this level of analysis precludes understanding how different suburbanization trajectories are between black and white households, net of differences in important household characteristics like socioeconomic status (i.e. education) and housing unit tenure. The empirical portion of the present study contributes novel evidence about how much segregated patterns of household mobility changed since 1980, and how much racial inequality in exposure to high poverty neighborhoods operates through mobility and in-place neighborhood change across urban as well as suburban locations. Overall, this research demonstrates that stratified suburbanization is a key element of contemporary racial inequality in exposure to disadvantaged neighborhoods, with black households' disproportionate exposure to the rising level of neighborhood poverty among suburbs linked to two-fold disadvantages through mobility and in-place change in the presence of segregation.

4.1 *Background*

Research on place-based disadvantages and residential mobility dynamics associated with poverty concentration was rejuvenated following *The Truly Disadvantaged*'s publication in 1987. William Julius Wilson's scholarship using data about neighborhood conditions in the 1980s highlighted the ways that urban poverty had been exacerbated through suburbanization and deindustrialization [91]. Other scholars observed that central cities had generally been on a trajectory of decline as white households increasingly moved to the suburbs in the second half the 20th century, a trend partially spurred onward by Federal housing policies related to homeownership and public housing [31]. Wilson's scholarship noted how these disadvantages were particularly detrimental to the standing of poor black households in central cities, a thread which other research elaborated substantially upon. Urban decline in the later part of the 20th century created "spatial mismatch" for black households relative to where jobs were being created, limited central cities' resources for providing public services like education or law enforcement, and exposed an increasing racialized population to neighborhood conditions of concentrated poverty [35] [36] [42].

The growing share of black households exposed to high levels of neighborhood poverty created an impetus for scholars to extend these earlier findings through two principal schools of research focused on a.) the mechanisms of place-based disadvantage and b.) the importance of racial segregation to the disparities Wilson observed. First, a large body literature sought to understand the magnitude and mechanisms of "neighborhood effects" on households, with the importance of neighborhood disadvantage for an outcome like educational attainment theoretically accounting

for black households' relatively disadvantaged socioeconomic attainment relative to whites [80]. Studies in this line of research provide substantial evidence of how living in poor neighborhoods is generally associated with exacerbated human development outcomes like higher likelihoods of dropping out of high school, experiencing abuse as a child, and engaging in delinquent behavior as an adolescent [4]. Further, durable differences in adult socioeconomic attainment reflect childhood differences in exposure to poor neighborhoods, with exposure during early childhood years especially relevant to this dynamic [8]. Beyond these aforementioned socioeconomic and developmental outcomes, studies also find racial inequalities in environmental conditions and health outcomes, generally reinforcing how "place matters" for structuring disadvantages and advantages across metropolitan space [11] [57] [81].

Another line of research about urban poverty articulated how the existence of these place based disadvantages and racial inequalities therein have their origin in exclusionary policies and practices supported by the Federal government and private citizens alike. The racialized dimension of place-based disadvantages is fundamentally linked to the continued existence of racial segregation at high levels in many metropolitan areas, particularly those which are the most populated [60]. Massey and Denton's research showed how racial segregation structures racial inequalities in exposure to neighborhood poverty, and importantly, centered the history of discrimination and exclusion that bore segregation in U.S. metropolitan areas as the primary reason for deleterious conditions within black neighborhoods. And while discrimination is less prevalent now than prior to the passage of the 1968 Fair Housing Act, recent research has found continued discrimination in housing markets by real estate agents and mortgage lenders and that housing search processes directly reflect prior

experiences of segregation [75] [25].

Initially, Massey and Denton's perspective led to some disagreement about whether segregation by race or class was relatively more important to poverty concentration in urban neighborhoods [33]. Over time, studies ultimately found merit to arguments presented by both Wilson and Massey and Denton about economic and racial segregation. Racial segregation is a primary drive of present-day inequalities in neighborhood context between black and white households, though processes of mobility by middle-class households across race nonetheless important to how racial segregation exacerbates exposure to high poverty contexts [71].

One mechanism by which segregation associates with worsened black/white disparities in exposure to neighborhood disadvantage is through increasing the likelihood that black households enter poor neighborhoods and reducing their likelihood of exiting poor neighborhoods when making residential moves, net of household characteristics like socioeconomic status and employment [6]. Studies investigating black and white residential mobility patterns frequently document support for this pathway to inequality, with substantial black-white differences in the likelihood of entering and exiting poor neighborhoods remaining after adjusting for household, neighborhood and metropolitan characteristics [83] [12]. Further, when looking at household outcomes across metropolitan areas, these studies find higher levels of segregation are associated with greater probabilities of black households' moves ending in a poor neighborhood, all else equal.

In-place neighborhood change contributes an important second mechanism through which racial segregation exacerbates disparities in exposure to high poverty neighborhoods, though this has commonly been understood through trajectories of change observed among urban neighborhoods.

Quillian (1999) demonstrated how segregation is relevant to trajectories of change over time in terms of racial integration and poverty concentration, above and beyond disproportionate levels of exposure to high poverty neighborhoods observed among black households when considering cross-sectional data [70]. While middle class black households became more likely to move to white nonpoor neighborhoods since the 1970s, neighborhoods with substantial black populations tended to follow a path towards resegregation. This dynamic complicates some of the theory about middle class black mobility by Wilson, and lends a second theoretical explanation for why levels of segregation experienced by black households living in suburbs are only modestly lower than what is experienced in central cities. More generally, the precarious position of middle class black neighborhoods provides a theorized mechanism for why many metropolitan areas continue to have high levels of racial segregation despite some middle class out-migration among black households [67].

Since the 1980s, moves to suburbs have become increasingly common across race, ethnicity and socioeconomic status [87] [28]. With the majority of the metropolitan U.S. population residing in suburban locations, suburbs have differentiated such that the conventional city/suburb dichotomy for studying suburbanization blurs substantial differences in the neighborhood compositions and neighborhood quality across different suburban locations. Instead, there are important differences between suburbs based on housing stock age and spatial location, with older suburbs that are located closest to central cities the places with the greatest prevalence of neighborhood poverty among suburban areas. Understanding where residential inequalities are most substantial, net of household differences in composition like socioeconomic status, will inform which suburban locations have

the greatest disparity in outcomes, and where suburbanization potentially is more reflective of spatial assimilation, or upward contextual mobility, as it has commonly been conceptualized.

4.2 *Research Question*

The literature review leads to the following research questions about the degree to which racial inequality in exposure to high poverty neighborhoods changed as suburbanization increased since 1980, and the household mechanisms that underpinned these trends in inequality.

1. Have black and white households patterns of residential mobility to urban and suburban locations become more similar over time?

2. Has greater suburbanization over time related to reduced black-white inequality in the likelihood of moving into high-poverty neighborhoods?

3. To what extent is there black-white inequality in the likelihood of a nonpoor neighborhood becoming poor in place in the years following a household's move?

4.3 *Data*

The present study's analyses use the Panel Study of Income Dynamics (PSID) to understand patterns of residential mobility and neighborhood change across different urban and suburban locations of U.S. metropolitan areas. The PSID is a nationally representative survey of the U.S. population that started in 1968 with a sample of 5,000 families (about 18,000 persons). Over time, the number of families in the panel has grown as children and other members of the original families have branched off and formed new households. The members of PSID families were interviewed annually through

1997, after which follow-ups have been on a bi-annual basis. The most recent wave of responses was for 2017.

Data from 1980, 1990, 2000 and 2010 decennial Census and 2013-2017 American Community Survey 5-year estimates are appended to PSID survey waves to understand the neighborhood and metropolitan contexts where households reside. I compute intercensal estimates using linear interpolation to provide all PSID waves with contemporaneous measures of neighborhood and metropolitan conditions[1]. The destination neighborhoods of PSID households are measured using estimates of population and housing composition for the Census Bureau's 2010 delineation of census tracts. These approximations of neighborhood contain approximately 4,000 persons on average, and all historical census tract data have been normalized to 2010 boundaries using the GeoLytics Neighborhood Change Database (NCDB). Metropolitan areas are defined using 2010 Core Based Statistical Areas, which the Census Bureau creates using one or more counties that have integrated housing and labor markets.

The present study draws upon waves of the PSID from 1980 to 2017 as its focal data source for modeling residential mobility and neighborhood change. I omit PSID households who live outside of U.S. metropolitan areas given the focus on understanding the aforementioned dynamics in urban and suburban contexts. I focus on black and white households for the following analyses because the number of observations for other racial/ethnic groups is relatively few, particularly in earlier waves of the panel. Using the restricted geocode file for the PSID, household moves are identified

[1]I treat the 2013-2017 ACS as the estimate for 2015. With the five estimates across time (1980, 1990, 2000, 2010, 2015) that this results in, I use linear interpolation to estimate values in intercensal years within 1980-2015 and extrapolate an estimate for 2017 values based on the 2010 to 2015 linear trend.

based on a change of census tract between two survey waves. The resulting set of household moves that occurred between 1980 and 2017 are the evidence for addressing the study's focal questions related to whether the locational trajectories of black and white households have become more similar with greater suburbanization and whether there are racial inequalities in exposure to high poverty neighborhoods across urban and suburban locations. Descriptive statistics for this dataset of household moves are available in Appendix D.

A subset of these moves that ended in a nonpoor neighborhood in waves from 1980 to 2013 are used to understand typical trajectories of neighborhood change among black and white households moving to different urban and suburban locations. Specifically, I assess how a neighborhood's poverty rate changed in the four years following a PSID household's entry into the tract, provided the household stayed in the same tract for the next four years.

4.4 *Measures*

4.4.1 Dependent variables

There are three focal residential outcomes for understanding the micro-level dynamics that underpin overall black-white inequality in exposure to high-poverty neighborhoods across urban and suburban locations. The first measure is a categorical indicator of whether a neighborhood is in a city, older suburb, newer suburb or rural/exurb location within its respective metropolitan area. This measure is generated using a method called *hierarchical clustering with spatial constraints* that allows a researcher to classify cases according to their variation across a set of sociodemographic measures while also taking into consideration how neighborhoods are organized in physical space. Because

of my theoretical focus on how differences in housing opportunities across suburban locations are relevant to structuring suburbanization opportunities a given household can consider, the key measures I use for the cluster analysis indicate whether a neighborhood is in a principal city of the metropolitan area and different features of the neighborhood's housing stock (age, density and development). More information about the cluster analysis methodology is available in Appendix A. Overall, this outcome sheds light on the types of urban or suburban neighborhood locations that households are moving to within a metropolitan area, and is key to disaggregating trends in residential mobility and neighborhood change across metropolitan space.

The second measure is a dichotomous indicator of whether or not a given household's move was to a high poverty neighborhood. I measure high poverty for a given destination neighborhood based on the threshold of 20 percent or more of the neighborhood population having incomes below the poverty line, since this follows a widely used convention and prior research observes that this is where neighborhood disadvantages due to poverty concentration start to accrue [24] [41]. This outcome provides insight into whether moves to different urban or suburban location tended to correspond with differences in a black or white household's likelihood of exposure to a high poverty neighborhood.

The third measure is another dichotomous variable, this time capturing whether a *nonpoor* destination neighborhood that a given black or white household moved to became high poverty after 4 years (i.e., after two PSID survey waves). Aside from analyzing whether there is racial disparity in the likelihood of entry into poor neighborhoods across urban and suburban locations, theory also supports investigating whether black households are more likely to move to neighborhoods

experiencing change in terms of rising poverty rates, particularly in metropolitan areas where segregation is more pronounced. This measure, while relatively short in its temporal extent, captures the degree to which black and white households face different likelihoods of experiencing such a trajectory upon moving to a nonpoor neighborhood.

4.4.2 Independent variables

There are three focal independent variables used in the following analyses. First, I use a linear covariate indicating the year the PSID interview took place to model time in the following regressions. Associations with this measure accordingly provide insight into whether certain types of moves or in-place change became more or less likely among PSID households over time. Second, I use the dissimilarity index for the metropolitan area that a PSID household currently resides in to measure the extent of racial residential segregation that the household experiences at the time of their move. The dissimilarity index can be interpreted as the share of black or white persons that would need to change neighborhoods in order to achieve even distribution of black and white persons across neighborhoods (relative to the metropolitan population composition). The dissimilarity index for a given metropolitan area accordingly ranges between 0 and 1, and can be obtained with the following formula:

$$D = \frac{1}{2}\sum_{i=1}^{N}\left|\frac{a_i}{A} - \frac{b_i}{B}\right|$$

Finally, within the models of entry into high poverty neighborhoods as well as the trajectory of neighborhood change among those who stay for four years, I incorporate the location type indicator generated via cluster analysis to disaggregate differences in these outcomes according to white or

black households' spatial locations within the metropolitan area.

I also draw on household level measures to adjust models for differences in household composition that are relevant to where households are likely to move, the quality of the neighborhood they move to, as well as the neighborhood's trajectory in terms of poverty over time. These include the head of household's age, sex, marital status (cohabitating/married, widowed, divorced, separated, single), educational attainment, employment status (employed, unemployed, out of labor force), as well as the number of persons in the family and whether the family rents or owns their housing unit. I include a fixed effect denoting whether one or two years passed since the last survey wave based on whether the interview wave was in 1999 or later to adjust for differences in mobility observed between the one year and two year interview frequencies.

4.5 *Analytic Strategy*

The first models of household moves that I consider are multinomial logistic regressions of the destination neighborhoods' location types. Results from these models inform how the likelihood of black and white households' moving to different urban and suburban locations changed over time, in addition to how characteristics of household tended to associate with differences in the likelihood of suburbanization and suburbanization trajectories. The first regression model specifies additive differences for each independent variable used to predict the likelihood of moving to one of the given location types. This specification assumes that the trend over time was the same for both black and white households, and that segregation has comparable associations across black and white households' locational outcomes. The second model then tests whether black and

white households experienced different trends over time for their mobility patterns, and whether segregation has different salience for the locations that black and white households move to. These regressions are used to generate predictions regarding how black and white households' probability of moving to different locations changed over time, net of differences in household composition. A key focus is whether or not greater suburbanization over time has associated with a convergence in black and white households' mobility patterns to different locations, once household socioeconomic status and composition are held constant.

The outcomes for the second and third research questions are modeled using logistic regressions. Like before, the first model specification includes only additive associations between independent variables and the respective binary outcome. The second model specification then includes terms to test whether the likelihood of entry into a high poverty neighborhood or the probability of a neighborhood becoming poor in place differs for black and white households based on the location they move to, the year when they moved and the extent of metropolitan segregation at the time. These interactions are important to understanding black and white households' differential risk of exposure to high poverty neighborhoods when making a residential move by considering how the difference 1.) changed over time, 2.) varies based on where they move (i.e. urban or different suburban locations), and 3.) depends on the level of metropolitan segregation. Overall, these respective sets of models provide insight into trends and household compositions associated with black-white differences in the likelihood of moving into a high poverty neighborhood and the probability of a nonpoor neighborhood becoming high poverty within four years of the household's arrival to it.

Because many households had multiple residential moves between 1980 and 2017, I use robust standard errors clustered by household to adjust for serial correlation over time and heteroskedasticity in model errors. I present tables of regression coefficients and line graphics displaying predicted probabilities as the primary information about the focal regression models. Tables of average marginal effects for the multinomial logistic and binary logistic regression models of this study generate consistent conclusions and are available in Appendix E.

4.6 *Results*

4.6.1 Urban and suburban locations

Table 4.1 provides estimated coefficients from the multinomial logistic regressions of the location type that black and white PSID households moved to after a given instance of residential mobility. Each column of coefficients for a given model corresponds to a suburban neighborhood location type, with the reference group set as a move to a city neighborhood. Model 1 uses additive terms (on log-odds scale) to understand differences and trends in the likelihood of moving to different urban and suburban locations among black and white households who moved between 1980 and 2017. The significant negative coefficient for black households across models describes how, net of change over time, black households have been less likely to move to suburban locations than white households. There is, however, some variation between the suburban location types, with older suburbs the most likely suburban destination for black households, and rural/exurb locations the least likely. The coefficient for the yearly trend over time indicates that, holding household composition and metropolitan segregation constant, all households have been more likely to move to all suburban

locations since 1980. Finally, Model 1 shows that as black-white segregation increases, households are more likely to move to older suburbs and less likely to move to rural/exurb locations (though this theoretically masks important variation in segregation's importance between black and white households).

There are a number of other household characteristics associated with differences in locational outcomes. Households where the head is single or separated from his/her spouse were significantly less likely to move to all suburban locations than households where the head is married or cohabitating (reference). Similarly, households where the head was divorced were significantly less likely to move to newer suburbs than the reference category for married or cohabitating households. Higher levels of education tended to associate with a greater likelihood of moving to newer suburbs and lower likelihood of moving to rural/exurb locations. Unemployment and being out of the labor force (reference = employed) both significantly reduced the likelihood of moving to any of the suburban destinations. Differences in family size were generally unrelated to the likelihood of moving to the different location types, indicating the general prevalence of moves to suburban locations are among households of one, two or many persons, net of other differences in household composition. Finally, households who rent their housing were relatively less likely to move to all of the suburban locations than those who own, though this was particularly true for newer suburb and rural/exurb locations.

Next, Model 2 tests whether there were black-white differences in trends over time and the salience of metropolitan segregation for the likelihood of moving to different urban or suburban locations. To facilitate interpreting the coefficients for change over time from this interactive model,

Table 4.1: Multinomial logistic regression of destination neighborhood's location type, PSID household moves 1980-2017

	Model 1			Model 2		
	Older Suburb	Newer Suburb	Rural/Exurb	Older Suburb	Newer Suburb	Rural/Exurb
Black	-0.521***	-1.069***	-1.249***	-18.601*	-39.844***	48.704***
	(0.050)	(0.046)	(0.056)	(8.468)	(7.730)	(9.590)
Year	0.013***	0.018***	0.019***	0.007	0.009*	0.023***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
Metro black-white segregation	2.440***	0.167	-2.281***	4.815***	2.454***	0.875***
	(0.216)	(0.180)	(0.214)	(0.298)	(0.238)	(0.251)
Age	0.002	0.003	-0.001	0.001	0.003	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Female	0.045	-0.033	-0.103	0.037	-0.041	-0.095
	(0.061)	(0.058)	(0.072)	(0.061)	(0.058)	(0.071)
Widowed	-0.152	-0.083	-0.142	-0.121	-0.043	-0.118
	(0.130)	(0.115)	(0.145)	(0.129)	(0.116)	(0.144)
Divorced	-0.035	-0.201**	-0.147†	-0.024	-0.189**	-0.128
	(0.077)	(0.071)	(0.085)	(0.077)	(0.071)	(0.084)
Separated	-0.235**	-0.279***	-0.128	-0.204*	-0.235**	-0.118
	(0.085)	(0.078)	(0.090)	(0.085)	(0.078)	(0.090)
Single	-0.284***	-0.525***	-0.585***	-0.269***	-0.512***	-0.548***
	(0.071)	(0.067)	(0.083)	(0.071)	(0.067)	(0.082)
Education (yrs)	0.005	0.063***	-0.065***	0.008	0.065***	-0.061***
	(0.010)	(0.009)	(0.010)	(0.010)	(0.009)	(0.010)
Unemployed	-0.214***	-0.409***	-0.271***	-0.179**	-0.371***	-0.207**
	(0.061)	(0.062)	(0.074)	(0.061)	(0.062)	(0.074)
Out of labor force	-0.143*	-0.305***	-0.167*	-0.098	-0.258***	-0.124†
	(0.063)	(0.057)	(0.068)	(0.064)	(0.058)	(0.067)
N in family unit	0.008	-0.003	0.013	0.015	0.006	0.025
	(0.016)	(0.015)	(0.017)	(0.016)	(0.015)	(0.017)
Rents	-0.112*	-0.528***	-1.181***	-0.118*	-0.530***	-1.164***
	(0.048)	(0.043)	(0.050)	(0.049)	(0.043)	(0.050)
Neither rents or owns	-0.012	-0.254***	-0.252***	-0.024	-0.255***	-0.260***
	(0.076)	(0.070)	(0.076)	(0.076)	(0.071)	(0.075)
Number of years between waves=2	0.036	0.091	0.071	0.055	0.123†	0.102
	(0.074)	(0.069)	(0.080)	(0.075)	(0.070)	(0.080)
Black×Year				0.010*	0.021***	-0.023***
				(0.004)	(0.004)	(0.005)
Black×Metro black-white segregation				-4.107***	-4.837***	-8.096***
				(0.434)	(0.365)	(0.455)
Constant	-28.623***	-36.420***	-34.918***	-16.818*	-20.359**	-46.052***
	(6.895)	(6.369)	(7.688)	(8.305)	(7.347)	(8.427)
Observations	31614			31614		
AIC	73189.37			72222.52		

Standard errors in parentheses
† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Figure 4.1 shows adjusted predicted probabilities for white and black households' likelihoods of moving to each of the four location types in 1980, 1990, 2001, 2011 and 2017[2]. The left most pane indicates that the significant black-white difference in the likelihood of moving to city neighborhoods remained mostly the same amid significant trends of declining mobility to city neighborhoods and rising suburbanization from 1980 to 2017. At the latest observation in 2017, this corresponded to black households having about a 51% predicted probability of making a move to a city neighborhood compared to a 32% probability among white households.

The second pane from the left shows the trends in the likelihood of mobility to older suburb locations, where there were significantly different trends between black and white households over the 1980 to 2017 period. While black households were significantly more likely to move to neighborhoods in older suburbs in 2017 compared to 1980, white households experienced a non-significant decline in the likelihood of moving to older suburb neighborhoods. Altogether, these differences in trends corresponded to black households becoming significantly more likely to move to older suburbs than white households by the 2017 prediction[3]. Nevertheless, at the time of the latest observation, both probabilities were still fairly comparable in absolute terms (.20 vs .17).

The third pane from the left in Figure 4.1 displays how the likelihood of white and black households moving to newer suburbs changed over time. The predictions indicate substantially different trends between black and white households over time in terms of the likelihood of moving to

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[2]The shift to odd-numbered years starting in 2001 are a consequence of the PSID's transition to survey families every other year beginning in 1997. An estimate for 2017 is provided to give insight into patterns of residential mobility at the most recent wave of PSID interviews.

[3]Though it is somewhat hard to discern from the 95% confidence intervals in Figure 4.1, the difference between the black and white estimates for 2017 is significant at the $p < .05$ level.

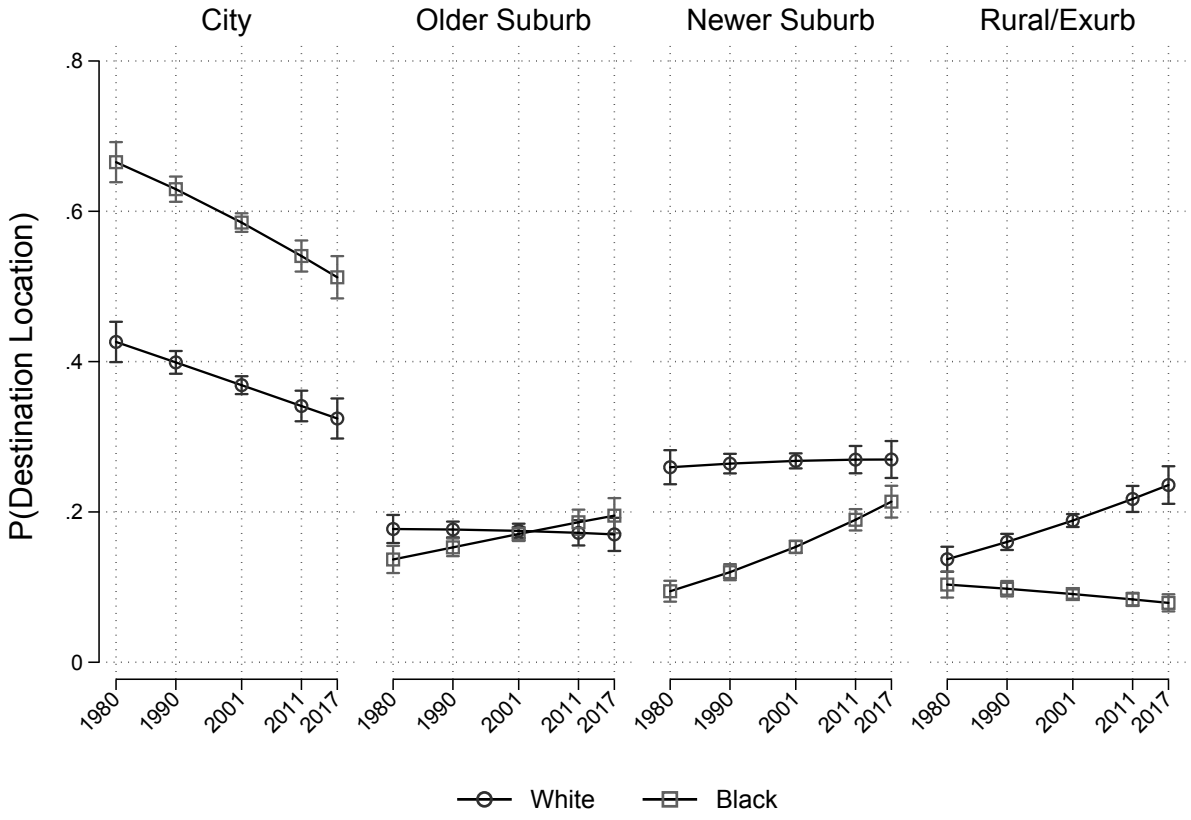

Figure 4.1: Predicted probability of white and black mobility to city, older suburb, newer suburb and rural/exurb location, 1980-2017

newer suburb neighborhoods—the likelihood for black households approximately doubled between 1980 and 2017 (.09 vs .21), whereas the likelihood for white households remained essentially the same over that period of time (.26 vs .27). This dynamic supports a conclusion that trends of greater suburbanization over time did lead to greater comparability between black and white households in the likelihood of moving to either older suburb or newer suburbs, holding all else equal.

A trend contributing to continued differences in segregation between different locations, albeit

in a different spatial configuration, is rising mobility among whites to rural/exurb locations. Though there was a modest trend of declining likelihood of moves to rural/exurb locations among black households from 1980 to 2017, this was mostly dwarfed by the 50% relative increase in probability in mobility to this location type among white households. Adjusted for differences in household composition, the trends over time suggest that white households were three times as likely as black households to move to rural/exurb locations at the time of the 2017 wave (.24 vs .08).

The final set of results for this outcome concern how segregation associates with significant differences in the likelihood of black and white households moving to each of the four location types. Model 2 shows that the mobility patterns of black and white households have significantly different associations with metropolitan segregation. Each suburban location was characterized by a linear term for white households suggesting greater likelihood of suburbanization as segregation increases. As segregation increases, black households are more likely to move to older suburbs (significantly less than white households, but still a positive net association), but significantly less likely to move to newer suburb and rural/exurb locations.

Figure 4.2 displays how the predicted probability of a move to each of the location types varies across segregation levels for both black and white households. Starting with the left-most pane, the probability of moves to city neighborhoods had the strongest association with differences in segregation. Whether comparing across metropolitan areas or considering change in segregation within a metropolitan area over time, increases of .1 for metropolitan black-white segregation were typically associated with a 10% increase in the likelihood of a move being to a city neighborhood and about a 6% decrease in the likelihood for white households.

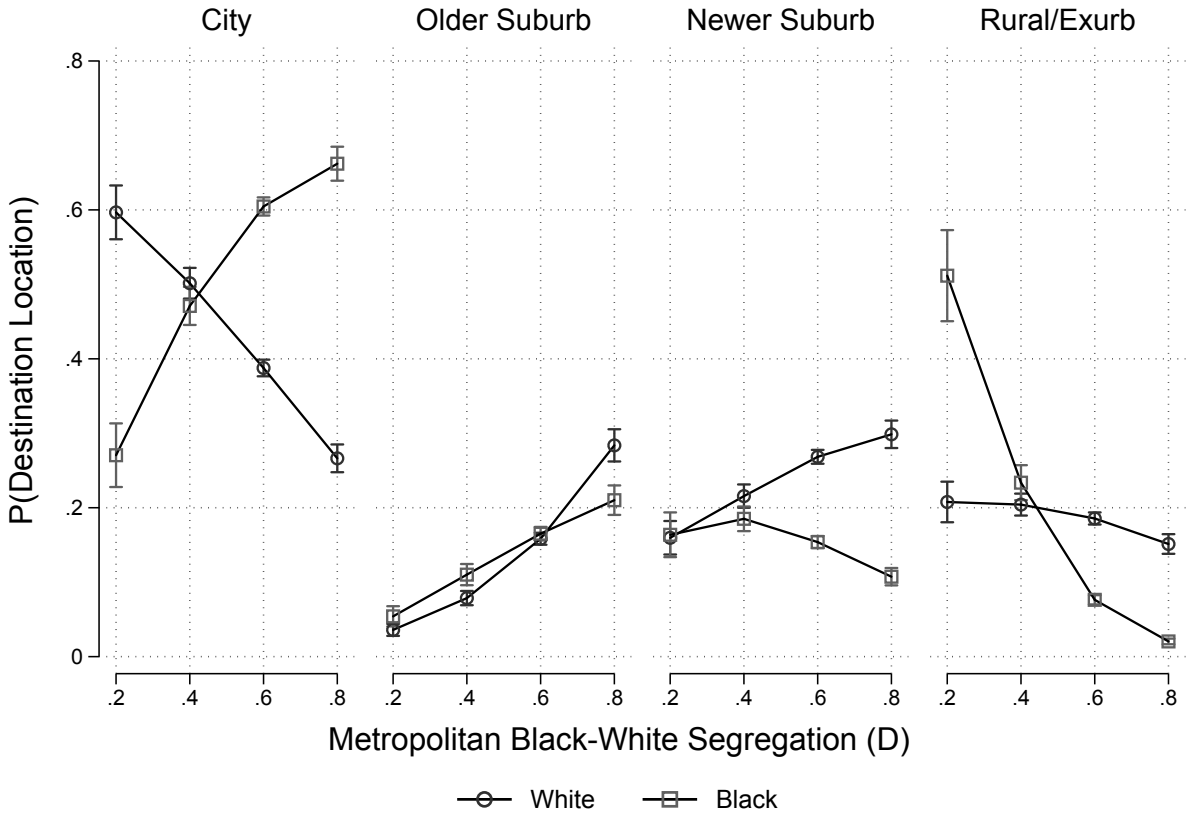

Figure 4.2: Predicted probability of white and black mobility to city, older suburb, newer suburb and rural/exurb location, by metropolitan black-white segregation (D)

The panels for the suburban locations show how segregation has somewhat different associations with mobility patterns based on the specific suburb in question. For example, higher levels of segregation associated with greater likelihood of both white and households moving to older suburbs. In contrast, there is a substantial divergence in the likelihood of black and white households moving to newer suburb neighborhoods as segregation rises. Finally, the association for black households' likelihood of moving to rural/exurb locations shows a steep decline in probability

as segregation increases from very low levels (which were rare to begin with, and concentrated among Southern metropolitan areas), after which further declines serve to essentially reduce this probability to 0 in the most segregated metropolitan areas. For white households, the relatively smaller positive coefficient for segregation's association with rural/exurb mobility serves to generate a shallow, significant decline in probability of moving to these locations. Nevertheless, a white household moving to one of the three suburban types still becomes increasingly expected as segregation increases due to dynamics in the other two suburban locations. Overall, these predicted probabilities evince how greater levels of segregation in a metropolitan area are salient to the types of suburbanization trajectories that are observed among black and white households, with higher levels of segregation associated with the long-standing city/suburb divide in terms of residential outcomes between black and white households, but also new differences between suburbs (where newer suburb and rural/exurb locations tend to become relatively unlikely destinations for black households).

4.6.2 High poverty destination neighborhoods

The next models assess the likelihood that a black or white household moves into a high poverty neighborhood, conditional on the time period and the type of urban or suburban location they are moving to. The goal of this analysis is to provide evidence related to the second research question, that is, whether or not trends in suburbanization have corresponded to black and white households experiencing more comparable rates of entry into high poverty neighborhoods. Table 4.2 displays logistic regression coefficients on log-odds scale for the two models of whether households moved

to a poor neighborhood.

Model 1 uses only additive terms to understand how the likelihood of moving to a high poverty neighborhood varied over time, based on household race and the level of metropolitan segregation. The first coefficient for the black-white difference in Model 1 shows how, overall, black households have been significantly more likely to move to high poverty neighborhood than white households across time periods and spatial locations. The average marginal effect for the black-white difference in the probability of moving to a poor neighborhoods was about .22, showing how net of differences in household composition between black and white households, there is substantial racial inequality in households' likelihood of entering a high poverty neighborhood and experiencing the neighborhood disadvantages associated with elevated prevalence of poverty.

The coefficients for the three suburban location types show how the likelihood of moving into a poor neighborhoods is lower, on average, for a given household moving to a neighborhood in one of these locations. There are some differences between the suburban locations in terms of the likelihood of moves being to a poor neighborhood, with the most likely suburban move to a high poverty neighborhood being a destination among older suburbs (despite still having a lower probability of entry compared to cities). In contrast, newer suburbs were associated with the lowest probability of a move being to a high poverty neighborhood, with moves to rural/exurb neighborhoods falling in between older and newer suburbs in terms of this likelihood. Finally, the coefficient for annual change over time shows that there was a significant upward trend in terms of the likelihood of mobility into poor neighborhoods, reflecting the greater prevalence of such neighborhoods now compared to 1980.

Table 4.2: Logistic regression of whether destination neighborhood was high poverty, PSID household moves 1980-2017

	Model 1	Model 2
Black	1.331***	25.658***
	(0.038)	(6.828)
Older Suburb	-1.079***	-0.793***
	(0.046)	(0.078)
Newer Suburb	-2.065***	-1.841***
	(0.057)	(0.087)
Rural/Exurb	-1.596***	-1.317***
	(0.063)	(0.083)
Year	0.031***	0.040***
	(0.003)	(0.004)
Metro black-white segregation	1.502***	0.009
	(0.153)	(0.249)
Age	-0.005**	-0.004**
	(0.002)	(0.002)
Female	-0.069	-0.063
	(0.045)	(0.045)
Widowed	0.358***	0.340***
	(0.099)	(0.099)
Divorced	0.300***	0.298***
	(0.063)	(0.064)
Separated	0.428***	0.407***
	(0.066)	(0.066)
Single	0.450***	0.451***
	(0.057)	(0.057)
Education (yrs)	-0.155***	-0.158***
	(0.008)	(0.008)
Unemployed	0.426***	0.413***
	(0.048)	(0.049)
Out of labor force	0.269***	0.248***
	(0.047)	(0.048)
N in family unit	0.097***	0.093***
	(0.013)	(0.013)
Rents	0.438***	0.446***
	(0.045)	(0.045)
Neither rents or owns	0.349***	0.355***
	(0.065)	(0.066)
Number of years between waves=2	-0.183**	-0.209**
	(0.063)	(0.064)
Black×Older Suburb		-0.362***
		(0.096)
Black×Newer Suburb		-0.284*
		(0.115)
Black×Rural/Exurb		-0.460***
		(0.124)
Black×Year		-0.013***
		(0.003)
Black×Metro black-white segregation		2.154***
		(0.317)
Constant	-61.593***	-79.901***
	(5.840)	(7.447)
Observations	31614	31614
AIC	28827.48	28675.54

Standard errors in parentheses
† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

The household composition controls for Model 1 show important differences in the likelihood of moving to poor neighborhoods, net of the black-white difference, time trends and metropolitan segregation. Measures like age and the head of households' education had expected negative associations with mobility to a poor neighborhood. A number of household compositions associated with elevated probabilities, particularly those which are relevant to a households' resources for housing. For example, the categories for marital status (reference = cohabiting/married) show positive coefficients suggesting higher likelihoods of moving to a poor neighborhood, as do the categories for employment status (reference = employed). Similarly, renter households were generally more likely to move to a high poverty neighborhood compared to a household which owns its housing unit.

Model 2 investigates the degree to which black and white households had significantly different likelihoods of moving to a poor neighborhood across urban/suburban locations, time and degrees of metropolitan segregation[4]. First, the interactions for suburban locations show that racial disparity in the likelihood of moving to a poor suburban neighborhood is relatively smaller than the disparity between black and white households moving to a city neighborhood. Second, the interaction for racial differences in trends over time for this outcome shows that the increases over time for black households were smaller for black households than compared to white, though the predicted probability of entry into a poor neighborhood for black households remains significantly higher than the probability for white households, even at the most recent 2017 observation. Finally,

[4]A model where black and white households' trends varied between each location was tested but this specification did not show improvement in fit based off of model information criteria. Further, predictions from this model largely mirror those from Model 2.

the interaction for black-white difference in the association of segregation with moving to a poor neighborhood essentially absorbs all of the variation associated with segregation in Model 1. The net pattern of association implies a significantly higher likelihood of black households moving to a poor neighborhoods in more segregated contexts, whereas white households' probability does not differ.

Figure 4.3 displays the predicted trends from Model 2 for black and white households' probabilities of a move ending in a poor neighborhood across the key urban/suburban location types. In both urban and suburban locations, there has been and continues to be substantial racial disparity in mobility to poor neighborhoods. Black households moving to a neighborhood within cities are increasingly expected to move to poor contexts (2017 probability = .69), with older suburbs the next location where black household moves are most likely to end in exposure to high poverty (2017 probability = .43). Newer suburb and rural/exurb moves are relatively less likely to end in a poor neighborhood among both black and white households. Still, the 2017 probabilities of .25 and .31 for black household moves to newer suburb and rural/exurb neighborhoods are around twice that of white households (.11 and .17). To the extent that high poverty neighborhoods exist among newer suburbs, black households still appear to be disproportionately likely to move to them.

4.6.3 In-place neighborhood change

The final research question is about whether the nonpoor neighborhoods that black and white households move to are on comparable trajectories of change in terms of neighborhood quality, particularly among suburban locations. This analysis uses the subset of PSID household moves

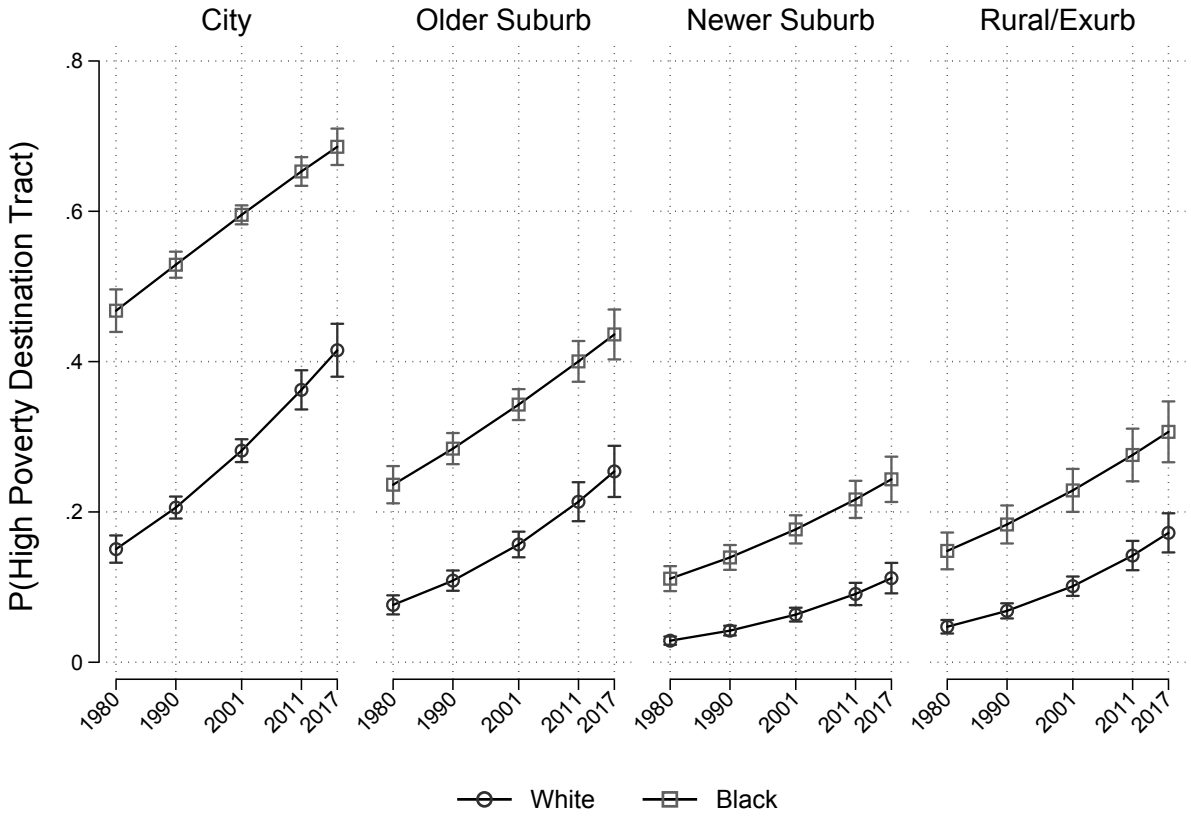

Figure 4.3: Predicted probability of white and black mobility to a high poverty neighborhood, by city, older suburb, newer suburb and rural/exurb location, 1980-2017

from 1980-2013 where a.) the destination neighborhood was a nonpoor neighborhood and b.) the household stayed in the same neighborhood for the following 4 years. These moves are used to understand the likelihood that neighborhoods become high poverty around households (even holding constant a given households' socioeconomic status). Further, these models are important to assessing whether there is racial disparity in declining neighborhood quality not only among city neighborhoods but also among the suburban locations. If there is stratification in the suburbanization

trajectories that black and white households follow, we might expect differences not only in the likelihood of moves being to a poor neighborhood, but also that black and white households are moving to nonpoor neighborhoods that are on relatively different courses of neighborhood change. Accordingly, the following set of models tests whether nonpoor neighborhoods that black households moved to have been more likely to become high poverty within 4 years compared to nonpoor destinations of white households, and whether any racial difference in this dynamic varied across urban and suburban locations, over time and based on metropolitan segregation.

Table 4.3 displays logistic regression coefficients from models of neighborhood change following a move to nonpoor neighborhood. As with the other outcomes, Model 1 first explores associations using additive terms alone. The coefficient for the black/white difference in the likelihood of a nonpoor neighborhood becoming poor indicates a significantly greater risk of this neighborhood change outcome for black households compared to white households. The odds of a black households' neighborhood becoming high poverty around them were about 2.5 times as great as among white households, net of differences related to household composition, trends over time and metropolitan segregation. Moves to each of the suburban location types have been associated with significantly lower likelihoods of a nonpoor neighborhood becoming poor, holding all else equal, though the magnitude of this difference (relative to the likelihood in city neighborhoods) is comparatively smaller for older suburb neighborhoods compared to those in newer suburb and rural/exurb locations. The trends over time were positive and significant, indicating that the likelihood of this neighborhood change outcome has increased over time, holding everything else constant. Finally, this trajectory of change towards high poverty status has been more common for moves to

nonpoor neighborhoods within more segregated metropolitan areas.

In terms of the other household-level covariates, the most salient characteristics for the likelihood of a neighborhood becoming poor in place appear to be differences in the marital status, educational attainment and employment status of the head of household. Each of these covariates has a close association to the resources available when selecting a housing unit in some neighborhood, with those that are relatively more disadvantaged in terms of resources more likely to move to contexts where the neighborhood is on a trajectory towards rising prevalence of poverty. Otherwise, the lack of associations for measures like whether a household rents their housing unit (reference = owns housing unit) suggests that renters and homeowners alike are susceptible to this outcome, in contrast to the differences observed with mobility into poor neighborhoods.

Model 2 tests whether the differences in neighborhood change patterns by urban/suburban location, over time or based on segregation varied between black and white households. The results of these interactions suggest that trends over time and differences across urban/suburban neighborhoods have been relatively comparable between black and white households, as indicated by the non-significant interaction coefficients for the urban/suburban categories and the annual trend over time. However, the race-specific association of metropolitan segregation with the likelihood of a neighborhood becoming high poverty reveals that black households are exclusively disadvantaged by segregation, whereas white households have essentially the same odds of neighborhood change towards high poverty status across levels of segregation.

Figure 4.4 shows the predicted probability of a nonpoor neighborhood becoming high poverty for black and white households, across the urban and suburban locations as well as according

Table 4.3: Logistic regression of whether nonpoor destination neighborhood became high poverty within 4 years, PSID household moves 1980-2017

	Model 1	Model 2
Black	0.953***	16.353
	(0.152)	(37.863)
Older Suburb	-0.783***	-0.532
	(0.193)	(0.327)
Newer Suburb	-1.294***	-1.452***
	(0.190)	(0.327)
Rural/Exurb	-1.398***	-1.085***
	(0.230)	(0.308)
Year	0.051**	0.056*
	(0.017)	(0.022)
Metro black-white segregation	1.720**	-0.559
	(0.653)	(1.120)
Age	-0.004	-0.004
	(0.007)	(0.007)
Female	0.223	0.246
	(0.206)	(0.205)
Widowed	-0.373	-0.321
	(0.515)	(0.517)
Divorced	0.324	0.308
	(0.292)	(0.294)
Separated	0.633*	0.660*
	(0.309)	(0.308)
Single	0.512†	0.516†
	(0.273)	(0.274)
Education (yrs)	-0.148***	-0.147***
	(0.030)	(0.031)
Unemployed	0.518*	0.526*
	(0.230)	(0.230)
Out of labor force	-0.149	-0.187
	(0.228)	(0.228)
N in family unit	0.098†	0.095†
	(0.053)	(0.052)
Rents	0.068	0.077
	(0.172)	(0.173)
Neither rents or owns	0.158	0.179
	(0.303)	(0.303)
Number of years between waves=2	0.260	0.226
	(0.308)	(0.314)
Black×Older Suburb		-0.339
		(0.401)
Black×Newer Suburb		0.388
		(0.401)
Black×Rural/Exurb		-0.657
		(0.504)
Black×Year		-0.009
		(0.019)
Black×Metro black-white segregation		3.682**
		(1.411)
Constant	-103.724**	-113.648*
	(33.954)	(44.826)
Observations	4793	4793
AIC	1650.86	1645.05

Standard errors in parentheses
† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

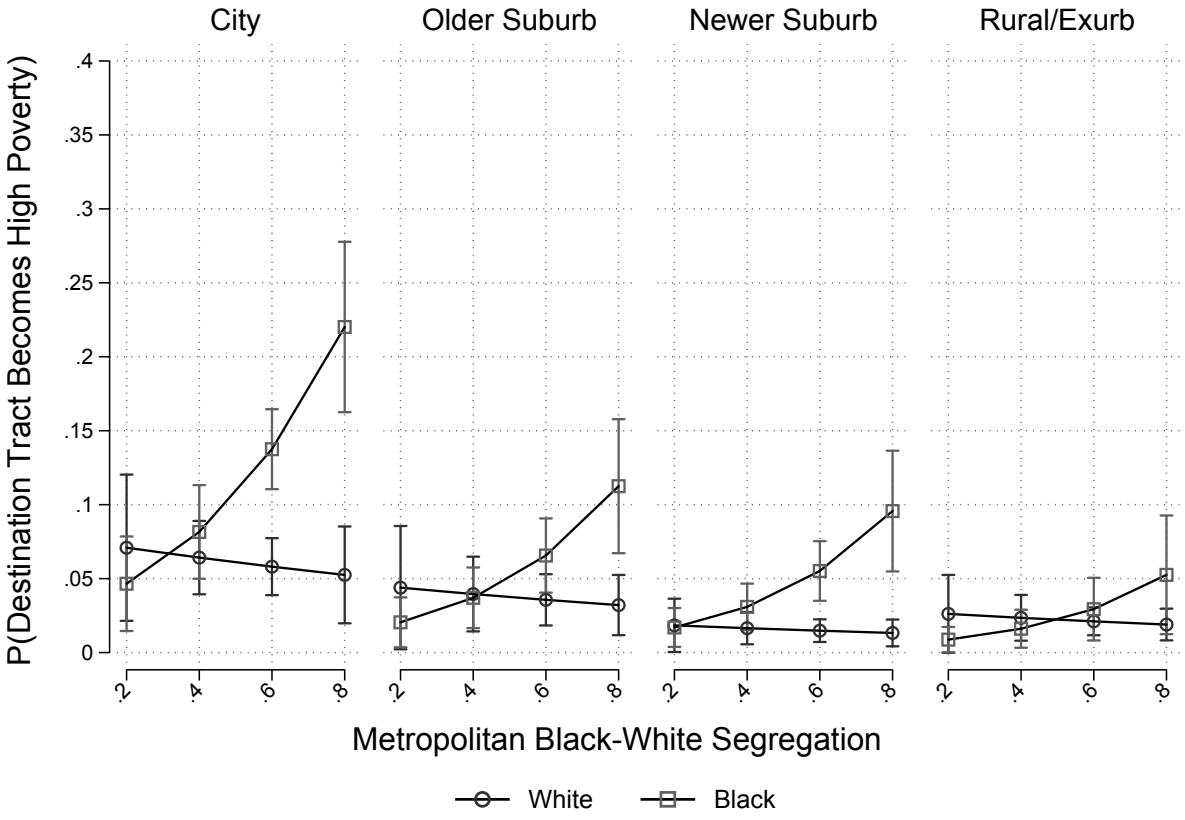

Figure 4.4: Predicted probability of nonpoor neighborhoods of black and white households becoming high poverty within four years, by city, older suburb, newer suburb and rural/exurb location and by metropolitan black-white segregation (D)

to levels of segregation in the metropolitan area. Starting from the left-hand side, the pane for moves ending in city neighborhoods shows that black households are at elevated risk for coming to reside in a high poverty neighborhood in place in metropolitan areas with moderate to high levels of segregation (i.e., dissimilarity index >= .5). As segregation increases, the probability of a nonpoor city neighborhood becoming poor around a black household diverges substantially from the corresponding prediction for white households.

In a very segregated metropolitan area like Chicago-Joliet-Naperville, IL-IN-WI, where the dissimilarity value is around .75, black households are accordingly about four times as likely than white households to experience a downward trajectory of neighborhood change when living in a city neighborhood. While the disparity in the likelihood of a neighborhood becoming poor in place is most stark among city neighborhoods, this inequality is observed within suburban locations too. In highly segregated metropolitan areas (i.e., dissimilarity index >= .6), black households are significantly more likely to have a nonpoor older suburb neighborhood become high poverty around them. Similarly, black households are at a significantly elevated risk of newer suburbs becoming high poverty within four years in metropolitan areas with moderate to high levels of segregation (i.e., dissimilarity index >= .5). Only in rural/exurb locations do black and white households have approximately the same risk of a neighborhood becoming high poverty across levels of metropolitan segregation, and the likelihood of mobility to rural/exurb neighborhoods remains relatively low for black households.

4.7 *Discussion*

Overall, rising levels of suburbanization have led to a relative convergence in black and white households' likelihood of moving to some suburban locations (i.e., older suburbs and newer suburbs). Still, the trends in mobility among city and rural/exurb locations indicate that there is spatial segregation in the neighborhoods that black and white households are likely to move to, even at the most recent 2017 observation. The differential mobility of black households to city neighborhoods, net of differences in household composition, contributes to segregation which follows the city/suburb

division. This is the spatial structure that scholars have historically viewed segregation as operating along, though the contrast in black and white households' mobility patterns is less stark than a few decades ago. However, this is not the only trend relevant to how segregation tends to operate across residential space. The rising black-white difference in the likelihood of moving to the most distant rural/exurb locations is a mechanism generating segregation between different suburban locations, with white households increasingly likely to move to suburban locations where black households are underrepresented.

The results related to the second research question suggest that black-white differences in the likelihood of exposure to high poverty neighborhoods remain large, particularly when households move to cities and older suburbs. The composition of suburbanization trajectories for black households suggests that older suburb and newer suburb neighborhoods are the most likely suburban destinations, with this skewing towards the former in more segregated metropolitan areas. Together, the dynamics related to locational trajectories and the likelihood of exposure to high poverty neighborhoods underpin black households' general overrepresentation in poor suburban neighborhoods. Adjusted for differences in household composition, segregated patterns of residential mobility among black and white households are relevant to differentiation between suburbs and racial inequality in exposure to suburban place-based disadvantages associated with high levels of poverty.

Finally, findings for third research question further evince how racial disparities in exposure to high poverty suburban neighborhoods are partially related to black households' increased risk of moving to neighborhoods which are on a trajectory towards rising poverty, likely due to rising

racial/ethnic segregation within the neighborhood. The trends over time appear to be roughly comparable between black and households, but segregation structures different likelihoods of in-place change such that this dynamic also contributes to black households' overrepresentation in high poverty neighborhoods in many metropolitan areas. Importantly, this neighborhood change dynamic was not limited to cities as it has commonly been understood. Both older suburbs and newer suburbs were contexts where racial disparities in exposure to in-place change were observed, even if the likelihoods were somewhat smaller relative to urban neighborhoods.

There are a few limitations to the present study worth noting. First, given the composition of the PSID in terms of household race and ethnicity, it is only possible to focus on the suburbanization patterns and contextual outcomes for black and white households. Previous research on the suburbanization of poverty finds that both black and Latino households are disproportionately represented in high poverty suburban neighborhoods, raising the likelihood that some of the dynamics explored here related to black-white segregation have comparable relationships when viewed through the lens of Latino-white segregation. Second, the analysis of in-place change uses a relatively limited time window for observing neighborhood change, and does not include the neighborhood change trajectories for households who moved away sometime within 4 years of arriving at a nonpoor neighborhood. The same focal relationship related to segregation (and black-white difference in its importance) is observed when using a 10 year window as the post-mobility period for neighborhood change, but it is likely that the omission of movers from nonpoor neighborhoods is leading to a conservative estimate of racial disparities in place change across urban and suburban locations.

Still, this study contributes a number of important insights into how racial disparities in expo-

sure to high poverty neighborhoods operates across different urban and suburban locations. There are two primary means by which a given black household faces a higher risk of exposure to high poverty contexts in urban and suburban locations, net of differences in household composition, with disparities in terms of residential mobility and in-place neighborhood change both important mechanisms for this dynamic. Further, the degree of racial inequality in suburbanization patterns and exposure to disadvantaged neighborhoods is directly related to the level of metropolitan segregation, all else equal, with more segregation in a metropolitan area generally associated with eroded residential attainment and worsened odds of a black household coming to reside in a high poverty neighborhood after their residential move.

Rising suburbanization across sociodemographic groups is an important trend for understanding the social structure of U.S. metropolitan areas, and residential segregation continues to be a key part of how suburbanization factors into residential inequalities between racial and ethnic groups. Before, segregation and suburbanization interacted in ways that generated suburbs' reputations as places of affluence and advantage, and this was directly related to stratifying and preventing non-white groups from having access to neighborhoods in these locations. Now, however, segregation and suburbanization are interacting in ways to create differentiation among suburbs, blurring the strong contrast between urban and suburban neighborhoods in some cases while in others creating contrast between suburban locations based on when the suburb was developed and how far from the metropolitan center it is located.

Though the form of segregation has changed, in many ways, the song remains the same: disrupting the cycle of segregation is key to remedying racial inequalities in opportunity and

advantage prevalent throughout metropolitan areas. The difference, and challenge for scholars and practitioners of the 21st century metropolis, is that this increasingly necessitates efforts to improve neighborhood conditions in cities and suburbs alike.

Chapter 5

THE FUTURE OF RESIDENTIAL INEQUALITY IN THE U.S.

5.1 *Summary*

The results of this dissertation show that rising suburbanization since the 1980s has reshaped the locations of high poverty neighborhoods and thereby, racial inequalities in residential conditions. While the prevalence and risk of exposure to neighborhood poverty are relatively lower in all three types of suburban locations compared to in cities, the older suburbs of more segregated metropolitan areas have an exceptionally greater share of black and Latino populations at risk of the disadvantages associated with high poverty neighborhoods. Furthermore, risk of exposure to neighborhood poverty and concentration of poverty only grew worse over time for persons living within city neighborhoods. These results suggest that the average residential experience between older suburbs and the other two suburban types is substantially different for black and Latino households when residing in a segregated metropolitan area, contrasting the relative advantage experienced by whites across suburban locations (lower levels of risk on average, negative or flat associations with segregation suggesting a protective effect).

Older suburb locations are becoming relatively more like cities, such that in a more segregated metropolitan area, about half of the black population living in older suburbs is predicted to reside in a high poverty neighborhood. Similarly, the poor population in older suburbs at risk of residing

in a poor neighborhood is substantially greater in segregated metropolitan areas, something average trends of rising poverty concentration only served to exacerbate. Overall, these trends imply that there are both urban and suburban locations of racial and ethnic residential stratification in segregated metropolitan areas, contrasts that are considerably more muted in relatively integrated metropolitan areas.

Decomposing overall metropolitan segregation into components for segregation within and between the urban and suburban location types shed light on how trends in suburbanization factored into the overall declines noted through prior literature. Based on the overall sample, metropolitan areas in the United States are on a trajectory towards almost half of all residential segregation of blacks and whites occurring either within a given suburban location (e.g., between neighborhoods of older suburbs) or between suburban locations, up substantially from the mostly-urban composition of segregation in 1980. Results were fairly comparable among the 50 largest metropolitan areas in terms of how the composition of segregation changed over time, though average overall levels segregation were higher among larger metropolitan areas, as others have observed throughout prior literature.

The declines in segregation from 1980 to the 2013-2017 American Community Survey (ACS) were associated with improvements in neighborhood integration within city neighborhoods, relatively muted improvements in neighborhood integration with older suburbs, and minor upticks in neighborhood segregation among newer suburb and rural/exurb neighborhoods. Segregation has always been at a relatively lower level in newer suburb and rural/exurb locations, with changing population distribution from city to these suburban locations meaning that the components for

these two locations have grown in their share of all segregation in a metropolitan area more through transfers than through changes in integration or segregation. Reflecting the general suburbanization of segregation noted throughout this chapter's results, about half of the 20 most segregated metropolitan areas have as much segregation attributable to blacks and whites residing in different neighborhoods among the three suburban locations as a whole, and three of these metropolitan areas had more segregation of black and white persons between the three suburban locations than between the central city and suburbs (i.e. the historical spatial structure of segregation).

Models analyzing within-metropolitan area variation in the components of suburban segregation found important differences related to changes in the metropolitan composition of segregation as well as the metropolitan demographic, political and economic context. Changes in the metropolitan composition of segregation associated with differences in the prevalence of segregation within particular suburban areas or between suburban locations altogether. Specifically, when newer suburbs and rural/exurbs experienced shallower than average declines in white representation over time (i.e. they remained homogeneous), these locations are salient to segregation through separation of black and white households between the focal types of suburban spatial locations, with the implication based on the present findings being that black households' suburban mobility is relatively constrained to older suburbs. Otherwise, metropolitan areas where there were greater than average increases in mobility to newer suburb and rural/exurb locations among black and whites alike tended to contribute more to segregation through separation between neighborhoods among suburbs (rather than higher level locations). Finally, metropolitan areas that experienced declines in segregation between the city and suburban periphery had significant increases in segregation

within newer suburb and rural/exurb locations, as well as significant increases in segregation between different suburban locations. Metropolitan areas with declining segregation within cities tended to have increases in segregation of blacks and whites between the three suburban locations, suggesting how increases in integration among urban neighborhoods were partially offset by greater differentiation in composition among suburbs.

There were also changes in metropolitan population composition relevant to how segregation suburbanized. Metropolitan areas which experienced population loss tended to have rising segregation within older suburbs, and a rising Latino share of the metropolitan population tended to associate with more black-white segregation in newer suburbs. These population dynamics suggest that older suburb segregation is more pronounced in a metropolitan area like Youngstown, OH-PA, whereas newer suburb segregation is more pronounced among a metropolitan area like San Antonio, TX. Higher levels of political fragmentation associated with greater segregation between suburbs, in line with theory about how political fragmentation facilitates differentiation in suburban space. Additionally, declines in employment activity in manufacturing and public administration sectors associated with rising segregation with older suburbs.

Finally, investigating the micro-level dynamics of inequality in exposure to poor suburban neighborhoods provided important evidence of how there are still substantial differences in the locations black and white households move to, net of differences in socioeconomic status. Regardless of the type of urban or suburban location, black households are still more likely to move into a high poverty neighborhood, all else equal. There is some variation between locations still, with cities and older suburbs where inequalities are widest between black and white households. These

inequalities in the likelihood of moving to poor neighborhoods remained fairly steady over time despite increasing suburbanization. Further, the black-white difference in exposure to high poverty neighborhoods only grows wider as a metropolitan area becomes more segregated. One feature of this inequality is that in all but rural/exurb locations, black households are significantly more likely to have a nonpoor neighborhood become high poverty around them when residing in a highly segregated metropolitan area. This highlights how there are differences in neighborhood quality between the typical neighborhood destinations of black and white households, but also differences in the relative trajectory that neighborhoods are on, even among those which would be considered higher quality.

5.2 *Implications*

These research findings have important implications for how scholars conceptualize residential segregation and the social structure of metropolitan areas. First, the cumulative findings show that as suburbanization grew more prevalent since the 1980s, differentiation between suburbs (c.f. [49]) was between specific types of suburban locations based on their housing and distance from the metropolitan center. The differences in housing options and proximity to resources between older suburb, newer suburb and rural/exurb locations are relevant to the affordability and feasibility of a household moving to a neighborhood in each. Furthermore, existing patterns of segregation structure knowledge of neighborhoods and social networks of family and friends such that moves to more disadvantaged locations like older suburbs are more theoretically more likely for black households moving in a more segregated metropolitan area. These trends complicate the common

conceptualization of cities and suburbs as a dichotomy, suggesting that this masks heterogeneity in residential mobility—some of which is more reflective of upward contextual mobility and some of which is more reflective of continued stratification of black households according to place.

These factors are relevant to how black and white households have relatively unequal outcomes in terms of neighborhood quality across urban and suburban locations. In line with theoretical expectations about the trajectories that suburban neighborhoods are on, the evidence from Chapter 4 suggests that when black households move to nonpoor older suburb, and to a lesser degree, newer suburb, neighborhoods, there is a significantly greater likelihood of it becoming high poverty within the near future in the presence of higher levels of segregation. Whether it is through persons becoming poor in place due to weak employment opportunities in the area, or through out mobility of nonpoor persons away from a neighborhood that black households are moving to, either would provide a mechanism through which suburban neighborhoods of black households would be more likely to become high poverty in segregated metropolitan areas.

Overall, patterns of household inequality in exposure to neighborhood disadvantage and aggregate structure of segregation in U.S. metropolitan areas are changing to reflect suburbanization across race, ethnicity and socioeconomic status. Suburbs have not always been privileged to the degree that discriminatory policies made them throughout much of the prior century, and the evidence documented in this dissertation corroborate a need to adjust theories of segregation and residential stratification to note its increasingly suburban form. There is some consistency with the previous paradigm—many city neighborhoods remain segregated—but the organizing spatial contour of segregation is no longer predominantly city/suburb. Differences in housing opportunities and

proximity between suburbs provide one way to understand how suburbs are quite heterogeneous, in terms of composition and how they contribute to metropolitan segregation.

5.3 *Future Directions*

The findings of this dissertation support a number of future lines of research into how residential inequalities exist to varying degrees across urban and suburban locations. Some direct extensions of the studies presented in this dissertation are to consider how the composition of Latino-white, Asian-white and multi-ethnic segregation changed as suburbanization increased over time. These extensions would inform some of the dynamics observed in the studies of this dissertation and generally provide a more complete picture of how suburbanization has interacted with patterns of residential segregation over time.

Another line of research is to investigate the set of neighborhoods that a household would have access to in different types of urban and suburban locations based on the observed cost and availability of housing within the metropolitan area. Renter households are the most likely to have constrained options across different types of suburban locations, with some areas simply too costly and others mostly owner-occupied. Accordingly, part of this work will be to also understand the relative access that households with low incomes using voucher assistance might have, and the degree to which neighborhood outcomes might be constrained by Fair Market Rent (FMR) or Small Area Fair Market Rent (SAFMR) standards.

A final extension is to test the degree to which changes in lifetime exposure to metropolitan segregation associate with differences in the likelihood of following particular suburbanization

trajectories in terms of location and destination neighborhood racial composition. This work is important for understanding how early experiences of segregation, as well as change over the life course, may be part of understanding black households overrepresentation in particular some suburban locations as well as in higher poverty neighborhoods.

5.4 *Conclusion*

Residential inequalities by race and ethnicity remain an important part of understanding socioeconomic differences between black, Latino and white households. Increased suburbanization since the 1980s has reshaped the locations of segregation and did associate with some improvements in neighborhood diversity (i.e. within cities and to a lesser degree, older suburbs). Still, a common theme throughout the work of this dissertation is that more segregated metropolitan areas tend to have substantial inequalities in black and Latino exposure to high poverty neighborhoods in both urban and suburban contexts, suggesting how there is still room for improving equity in neighborhood opportunity by race and ethnicity. Exposure to disadvantaged neighborhoods has been and continues to be a primary determinant of racial and ethnic differences in socioeconomic and health outcomes, making trends of rising neighborhood poverty in cities and suburbs of U.S. metropolitan areas all the more important to address with urgency.

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Appendix

APPENDIX A: ADDITIONAL INFORMATION ABOUT HIERARCHICAL CLUSTERING WITH SPATIAL CONSTRAINTS

Using a spatial weights matrix that indicates which tracts are contiguous to other tracts, *hierarchical clustering with spatial constraints* seeks to maximize the homogeneity within clusters (on the sociodemographic measures) while limiting the solutions to those that maximize spatial homogeneity (i.e. contiguity units into regions). The net result of this approach is that the spatial constraint reduces bumpiness or "checkerboarding" across space while preserving the derived clusterings' average composition on the sociodemographic measures of interest.

After matrices of distances in terms of sociodemographic measures and actual space are computed, the next step is to use an algorithm that uses a specific decision rule for determining how to cluster each case from the "bottom up". The method of *hierarchical clustering with spatial constraints* introduced by Chavent et al. (2017) uses Ward's method for this process. With each unit starting as its own cluster at first, Ward's method then iteratively combines two existing clusters based on merging the pair that results in the smallest increase in the resulting clusters' sum of squared variance. This method is useful for the present case because these clusters are accordingly compact (low variance) across the sociodemographic covariates of interest, in addition to being compact in terms of forming contiguous regions.

Ward's method requires a single matrix of distances, so *hierarchical clustering with spatial*

constraints accordingly uses a mixing parameter λ to determine the relative contribution of sociodemographic and spatial distances used with Ward's method. Estimating an optimal λ value requires searching for the value with the greatest improvement in spatial homogeneity relative to lost sociodemographic homogeneity. I extract four clusters from the resulting dendrogram that Ward's method produces corresponding to city, older suburb, newer suburb and rural/exurb locations.

Appendix

APPENDIX B: MODELS OF LATINO NEIGHBORHOOD POVERTY RATE AND OVERALL CONCENTRATION OF POVERTY USING METROPOLITAN LATINO-WHITE SEGREGATION

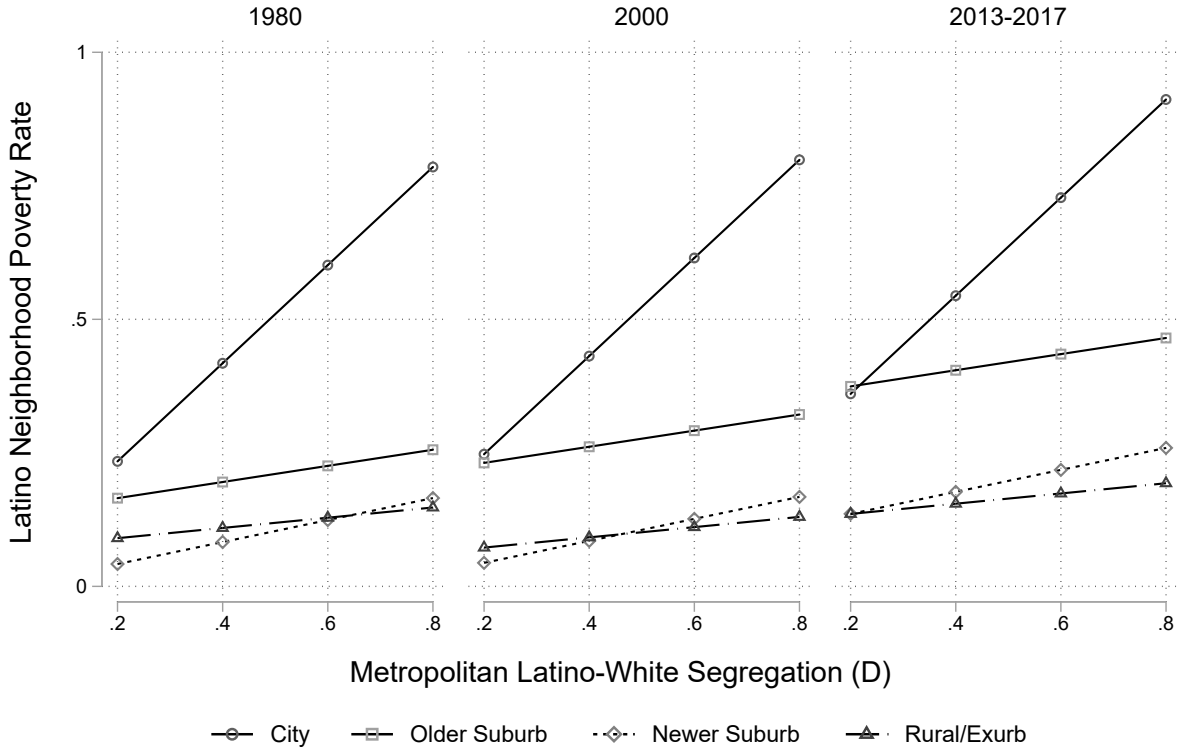
Appendix Table B.1: Linear regression of Latino neighborhood poverty rate by location type, time period and metropolitan Latino-white segregation

	Model 1	Model 2	Model 3
Older Suburb	-0.151***	-0.175***	0.085*
	(0.016)	(0.020)	(0.043)
Newer Suburb	-0.341***	-0.289***	-0.050
	(0.013)	(0.016)	(0.034)
Rural/Exurb	-0.327***	-0.255***	0.021
	(0.013)	(0.017)	(0.035)
Year = 1990	0.041***	0.038**	0.034**
	(0.008)	(0.012)	(0.012)
Year = 2000	0.014	0.041**	0.013
	(0.011)	(0.015)	(0.015)
Year = 2010	0.090***	0.139***	0.111***
	(0.015)	(0.018)	(0.019)
Year = 2015	0.115***	0.173***	0.126***
	(0.016)	(0.020)	(0.021)
Latino-White Segregation	0.362***	0.365***	0.919***
	(0.058)	(0.055)	(0.084)
Log(Metro Total Population)	-0.037	-0.037	-0.037
	(0.028)	(0.027)	(0.027)
Metro % Black	0.187	0.206	0.198
	(0.287)	(0.277)	(0.279)
Metro % White	0.017	0.023	0.022
	(0.132)	(0.134)	(0.133)
Metro % Latino	0.142	0.155	0.159
	(0.215)	(0.215)	(0.210)
Older Suburb × Year = 1990		0.049*	0.056**
		(0.020)	(0.020)
Older Suburb × Year = 2000		0.014	0.053*
		(0.020)	(0.022)
Older Suburb × Year = 2010		0.036	0.076**
		(0.025)	(0.026)
Older Suburb × Year = 2015		0.019	0.083**

		(0.028)	(0.030)
Newer Suburb × Year = 1990		-0.029*	-0.023†
		(0.014)	(0.014)
Newer Suburb × Year = 2000		-0.047**	-0.011
		(0.016)	(0.017)
Newer Suburb × Year = 2010		-0.092***	-0.054**
		(0.019)	(0.020)
Newer Suburb × Year = 2015		-0.093***	-0.032
		(0.021)	(0.023)
Rural/Exurb × Year = 1990		-0.005	0.002
		(0.017)	(0.017)
Rural/Exurb × Year = 2000		-0.072***	-0.031†
		(0.016)	(0.017)
Rural/Exurb × Year = 2010		-0.132***	-0.090***
		(0.019)	(0.020)
Rural/Exurb × Year = 2015		-0.150***	-0.081***
		(0.020)	(0.021)
Older Suburb × Latino-White Segregation			-0.767***
			(0.119)
Newer Suburb × Latino-White Segregation			-0.713***
			(0.098)
Rural/Exurb × Latino-White Segregation			-0.823***
			(0.098)
Constant	0.696†	0.653†	0.477
	(0.385)	(0.370)	(0.372)
Observations	4133	4133	4133
AIC	-2516.04	-2597.43	-2793.66
BIC	-2433.79	-2439.26	-2616.51

Standard errors in parentheses
† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Appendix Figure B.1: Predicted Latino neighborhood poverty rate for 1980, 2000 and 2013-2017 ACS by location type and metropolitan Latino-white segregation



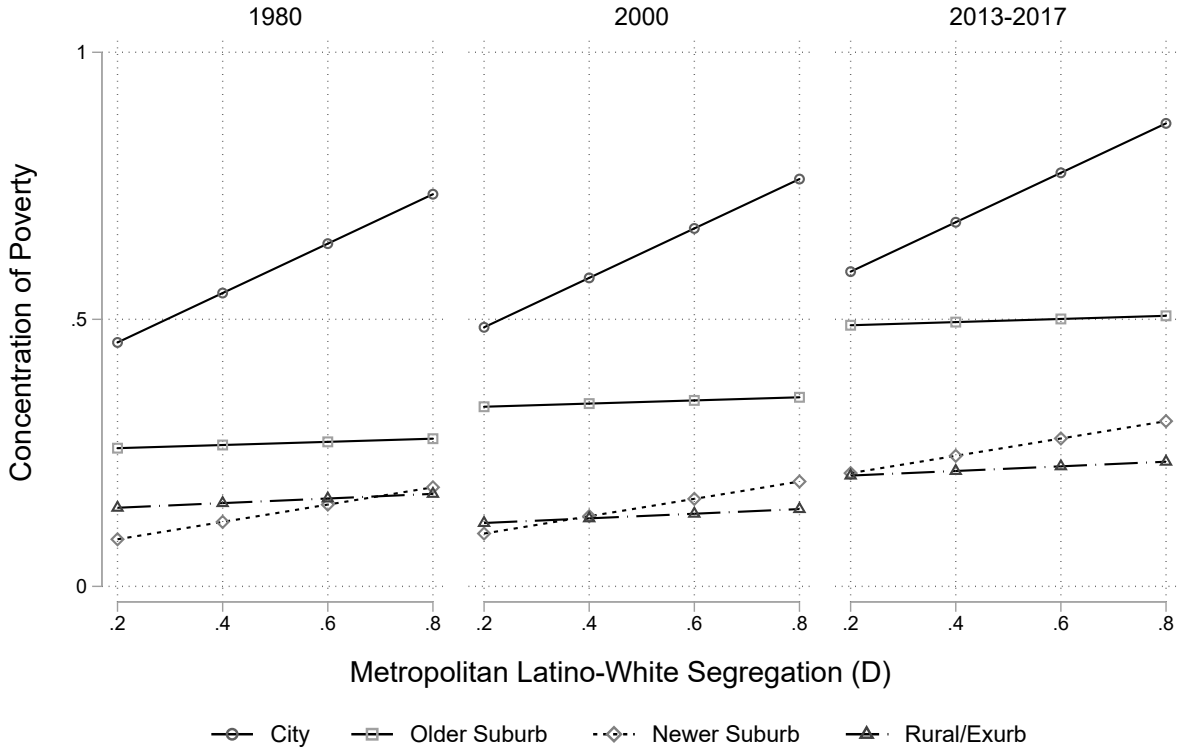
Appendix Table B.2: Linear regression of concentration of poverty by location type, time period and metropolitan Latino-white segregation

	Model 1	Model 2	Model 3
Older Suburb	-0.220***	-0.258***	-0.111*
	(0.016)	(0.021)	(0.048)
Newer Suburb	-0.441***	-0.409***	-0.308***
	(0.014)	(0.017)	(0.038)
Rural/Exurb	-0.429***	-0.366***	-0.226***
	(0.012)	(0.017)	(0.037)
Year = 1990	0.068***	0.076***	0.074***
	(0.008)	(0.011)	(0.011)
Year = 2000	0.018†	0.042**	0.028*
	(0.011)	(0.013)	(0.014)
Year = 2010	0.110***	0.138***	0.124***
	(0.015)	(0.018)	(0.018)
Year = 2015	0.131***	0.156***	0.133***
	(0.016)	(0.018)	(0.019)
Latino-White Segregation	0.185***	0.187***	0.463***
	(0.053)	(0.052)	(0.080)
Log(Metro Total Population)	-0.088**	-0.089**	-0.089***
	(0.028)	(0.027)	(0.027)
Metro % Black	0.348	0.357	0.350
	(0.293)	(0.284)	(0.286)
Metro % White	-0.001	0.008	0.007
	(0.129)	(0.128)	(0.127)
Metro % Latino	0.440*	0.456*	0.458*
	(0.222)	(0.218)	(0.215)
Older Suburb × Year = 1990		0.040*	0.045*
		(0.020)	(0.020)
Older Suburb × Year = 2000		0.027	0.049*
		(0.020)	(0.022)
Older Suburb × Year = 2010		0.056*	0.079**
		(0.025)	(0.026)
Older Suburb × Year = 2015		0.061*	0.098***
		(0.025)	(0.027)
Newer Suburb × Year = 1990		-0.043**	-0.041**
		(0.015)	(0.015)
Newer Suburb × Year = 2000		-0.033†	-0.018
		(0.018)	(0.019)
Newer Suburb × Year = 2010		-0.050*	-0.035
		(0.020)	(0.022)
Newer Suburb × Year = 2015		-0.034	-0.009
		(0.021)	(0.024)
Rural/Exurb × Year = 1990		-0.023	-0.019
		(0.017)	(0.017)
Rural/Exurb × Year = 2000		-0.078***	-0.057**
		(0.017)	(0.018)
Rural/Exurb × Year = 2010		-0.103***	-0.082***

		(0.019)	(0.020)
Rural/Exurb × Year = 2015		-0.107***	-0.072***
		(0.019)	(0.020)
Older Suburb × Latino-White Segregation			-0.433***
			(0.125)
Newer Suburb × Latino-White Segregation			-0.300**
			(0.102)
Rural/Exurb × Latino-White Segregation			-0.419***
			(0.097)
Constant	1.531***	1.517***	1.430***
	(0.378)	(0.371)	(0.373)
Observations	4133	4133	4133
AIC	-2244.35	-2290.29	-2333.70
BIC	-2162.11	-2132.12	-2156.55

Standard errors in parentheses
† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Appendix Figure B.2: Predicted concentration of poverty for 1980, 2000 and 2013-2017 ACS by location type and metropolitan Latino-white segregation



Appendix

APPENDIX C: THEIL DECOMPOSITION OF 1980 METROPOLITAN BLACK-WHITE SEGREGATION FOR 20 MOST SEGREGATED METROPOLITAN AREAS

Appendix Table C.1: Theil Decomposition of 1980 Metropolitan Black-White Segregation for 20 Most Segregated Metropolitan Areas

	Metro	Within				Between		Majority Suburb?	
Metropolitan Area	Total	City	OS	NS	Rural	City-Suburb	Suburbs	Within	Between
Chicago-Joliet-Naperville, IL-IN-WI	0.77	53.79	17.60	3.06	0.33	21.04	4.17		
Detroit-Warren-Livonia, MI	0.72	38.39	17.48	1.81	0.77	39.11	2.44		
Cleveland-Elyria-Mentor, OH	0.72	42.87	22.64	2.73	1.12	22.33	8.31		
Milwaukee-Waukesha-West Allis, WI	0.68	71.67	0.32	1.42	0.13	25.95	0.51		
St. Louis, MO-IL	0.66	31.77	34.72	5.59	0.59	17.93	9.40	✓	
Flint, MI	0.62	52.22	9.40	0.12	1.84	29.52	6.89		
Buffalo-Niagara Falls, NY	0.62	55.64	4.18	0.41	0.77	38.78	0.22		
Miami-Fort Lauderdale-Pompano Beach, FL	0.61	27.99	43.65	22.78	1.28	2.93	1.37	✓	
Dayton, OH	0.61	49.76	4.09	9.04	7.86	29.08	0.18		
Los Angeles-Long Beach-Santa Ana, CA	0.60	47.71	37.55	3.43	0.24	6.29	4.78		
New York-Newark-Jersey City, NY-NJ-PA	0.60	57.01	17.81	8.04	0.48	15.48	1.18		
Saginaw-Saginaw Township North, MI	0.59	38.94	14.56	0.50	18.07	15.92	12.02		
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	0.59	51.80	14.42	2.28	2.74	27.51	1.25		
Baltimore-Towson, MD	0.59	50.86	10.57	4.77	2.51	30.71	0.57		
Beaumont-Port Arthur, TX	0.56	50.86	8.69	0.13	8.00	30.47	1.85		
Niles-Benton Harbor, MI	0.53	27.14	6.53	4.43	8.24	34.08	19.58		
Birmingham-Hoover, AL	0.53	47.40	11.95	4.67	4.89	22.50	8.60		
New Orleans-Metairie-Kenner, LA	0.51	71.37	9.32	1.84	5.37	9.69	2.41		
Peoria, IL	0.44	43.72	7.58	0.41	0.78	43.49	4.02		
Bridgeport-Stamford-Norwalk, CT	0.39	51.84	7.74	3.40	1.32	35.05	0.66		

Appendix

APPENDIX D: DESCRIPTIVE STATISTICS ON PSID HOUSEHOLD MOVES, 1980-2017

Appendix Table D.1: Descriptive statistics for PSID households, 1980-2017

	Mean	SD	Min	Max
Year	1998.071	11.24631	1980	2017
Race	1.490194	.4999117	1	2
Age	37.34848	13.77084	16	104
Sex	1.394793	.488814	1	2
Education (yrs)	12.82144	2.47768	1	17
N in family unit	2.540046	1.523639	1	14
Metro black-white segregation	.6123812	.1252996	.1189493	.876218
Observations	31614			

Appendix Table D.2: Employment composition of PSID households

	Employment status
Employed	22802
Unemployed	3353
Out of labor force	5459
Total	31614
Observations	31614

Appendix Table D.3: Family composition of PSID households

	Marital Status
Married/cohabitating	12159
Widowed	1517
Divorced	4861
Separated	3223
Single	9854
Total	31614
Observations	31614

Appendix Table D.4: Housing unit tenure of PSID households

	Tenure
Owns Home	8134
Rents	20632
Neither	2848
Total	31614
Observations	31614

Appendix

APPENDIX E: AVERAGE MARGINAL EFFECTS FOR MODELS OF PSID HOUSEHOLD MOVES, 1980-2017

Appendix Table E.1: Average marginal effects for multinomial logistic regression of whether nonpoor neighborhood became high poverty within 4 years, PSID HH moves 1980-2017

	Model 1	Model 2
Black		
City	0.215***	0.219***
	(0.009)	(0.008)
Older Suburb	-0.011†	-0.011†
	(0.006)	(0.006)
Newer Suburb	-0.114***	-0.115***
	(0.007)	(0.006)
Rural/Exurb	-0.091***	-0.093***
	(0.005)	(0.005)
Year		
City	-0.004***	-0.003***
	(0.001)	(0.001)
Older Suburb	0.001†	0.001
	(0.000)	(0.000)
Newer Suburb	0.002***	0.002***
	(0.000)	(0.000)
Rural/Exurb	0.001**	0.001**
	(0.000)	(0.000)
Metro black-white segregation		
City	-0.092**	-0.091**
	(0.035)	(0.033)
Older Suburb	0.372***	0.368***
	(0.027)	(0.026)
Newer Suburb	0.022	0.017
	(0.024)	(0.024)
Rural/Exurb	-0.302***	-0.294***
	(0.021)	(0.020)
Age		
City	-0.000	-0.000
	(0.000)	(0.000)

Older Suburb	0.000	0.000
	(0.000)	(0.000)
Newer Suburb	0.000†	0.000
	(0.000)	(0.000)
Rural/Exurb	-0.000	-0.000
	(0.000)	(0.000)
Female		
City	0.005	0.005
	(0.010)	(0.010)
Older Suburb	0.009	0.008
	(0.008)	(0.008)
Newer Suburb	-0.003	-0.004
	(0.008)	(0.008)
Rural/Exurb	-0.011	-0.009
	(0.007)	(0.007)
Widowed		
City	0.027	0.019
	(0.022)	(0.021)
Older Suburb	-0.015	-0.012
	(0.016)	(0.016)
Newer Suburb	-0.003	0.002
	(0.017)	(0.018)
Rural/Exurb	-0.010	-0.009
	(0.015)	(0.015)
Divorced		
City	0.029*	0.025*
	(0.013)	(0.013)
Older Suburb	0.006	0.007
	(0.010)	(0.010)
Newer Suburb	-0.026*	-0.025*
	(0.010)	(0.010)
Rural/Exurb	-0.009	-0.007
	(0.009)	(0.009)
Separated		
City	0.051***	0.043**
	(0.014)	(0.014)
Older Suburb	-0.019†	-0.016
	(0.011)	(0.011)
Newer Suburb	-0.032**	-0.026*
	(0.011)	(0.011)
Rural/Exurb	0.001	-0.000
	(0.010)	(0.010)
Single		
City	0.102***	0.096***
	(0.012)	(0.012)
Older Suburb	-0.010	-0.008
	(0.009)	(0.009)

Newer Suburb	-0.054***	-0.052***
	(0.009)	(0.009)
Rural/Exurb	-0.039***	-0.035***
	(0.008)	(0.008)
Education (yrs)		
City	-0.003	-0.003†
	(0.002)	(0.002)
Older Suburb	-0.000	-0.000
	(0.001)	(0.001)
Newer Suburb	0.012***	0.012***
	(0.001)	(0.001)
Rural/Exurb	-0.009***	-0.009***
	(0.001)	(0.001)
Unemployed		
City	0.068***	0.057***
	(0.010)	(0.010)
Older Suburb	-0.011	-0.008
	(0.008)	(0.008)
Newer Suburb	-0.046***	-0.043***
	(0.008)	(0.008)
Rural/Exurb	-0.011	-0.006
	(0.007)	(0.007)
Out of labor force		
City	0.047***	0.037***
	(0.010)	(0.010)
Older Suburb	-0.006	-0.002
	(0.008)	(0.008)
Newer Suburb	-0.037***	-0.032***
	(0.008)	(0.008)
Rural/Exurb	-0.005	-0.002
	(0.007)	(0.007)
N in family unit		
City	-0.001	-0.003
	(0.003)	(0.003)
Older Suburb	0.001	0.001
	(0.002)	(0.002)
Newer Suburb	-0.001	-0.000
	(0.002)	(0.002)
Rural/Exurb	0.001	0.002
	(0.002)	(0.002)
Rents		
City	0.127***	0.123***
	(0.008)	(0.008)
Older Suburb	0.030***	0.029***
	(0.006)	(0.006)
Newer Suburb	-0.039***	-0.038***
	(0.006)	(0.006)

Rural/Exurb	-0.118***	-0.114***
	(0.006)	(0.006)
Neither rents or owns		
City	0.040***	0.040***
	(0.012)	(0.012)
Older Suburb	0.014	0.013
	(0.009)	(0.009)
Newer Suburb	-0.030**	-0.028**
	(0.010)	(0.010)
Rural/Exurb	-0.025*	-0.025*
	(0.010)	(0.010)
Number of yrs between waves=2		
City	-0.015	-0.020†
	(0.012)	(0.012)
Older Suburb	0.000	0.001
	(0.009)	(0.009)
Newer Suburb	0.011	0.014
	(0.010)	(0.010)
Rural/Exurb	0.004	0.006
	(0.008)	(0.008)

Standard errors in parentheses
† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Appendix Table E.2: Average marginal effects for logistic regression of whether move ended in a high poverty neighborhood, PSID HH moves 1980-2017

	Model 1	Model 2
Black	0.217***	0.222***
	(0.006)	(0.006)
Older Suburb	-0.191***	-0.180***
	(0.007)	(0.008)
Newer Suburb	-0.313***	-0.305***
	(0.007)	(0.007)
Rural/Exurb	-0.262***	-0.263***
	(0.009)	(0.009)
Year	0.005***	0.005***
	(0.000)	(0.000)
Metro black-white segregation	0.223***	0.209***
	(0.022)	(0.022)
Age	-0.001**	-0.001**
	(0.000)	(0.000)
Female	-0.010	-0.009
	(0.007)	(0.007)
Widowed	0.053***	0.050***
	(0.015)	(0.015)
Divorced	0.045***	0.044***
	(0.009)	(0.009)
Separated	0.064***	0.060***
	(0.010)	(0.010)
Single	0.068***	0.067***
	(0.009)	(0.009)
Education (yrs)	-0.023***	-0.023***
	(0.001)	(0.001)
Unemployed	0.065***	0.063***
	(0.008)	(0.008)
Out of labor force	0.041***	0.037***
	(0.007)	(0.007)
N in family unit	0.014***	0.014***
	(0.002)	(0.002)
Rents	0.065***	0.065***
	(0.007)	(0.006)
Neither	0.051***	0.051***
	(0.010)	(0.010)
Number of years between waves=2	-0.027**	-0.031**
	(0.009)	(0.009)
Observations	31614	31614

Standard errors in parentheses
† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Appendix Table E.3: Average marginal effects for logistic regression of whether nonpoor neighborhood became high poverty within 4 years, PSID HH moves 1980-2017

	Model 1	Model 2
Black	0.044***	0.044***
	(0.007)	(0.007)
Older Suburb	-0.044***	-0.040***
	(0.010)	(0.010)
Newer Suburb	-0.062***	-0.057***
	(0.009)	(0.009)
Rural/Exurb	-0.064***	-0.063***
	(0.009)	(0.009)
Year	0.002**	0.002**
	(0.001)	(0.001)
Metro black-white segregation	0.075**	0.075*
	(0.028)	(0.029)
Age	-0.000	-0.000
	(0.000)	(0.000)
Female	0.010	0.011
	(0.009)	(0.009)
Widowed	-0.012	-0.011
	(0.015)	(0.016)
Divorced	0.014	0.013
	(0.013)	(0.013)
Separated	0.030†	0.032†
	(0.016)	(0.016)
Single	0.023†	0.023†
	(0.013)	(0.013)
Education (yrs)	-0.006***	-0.006***
	(0.001)	(0.001)
Unemployed	0.027†	0.028*
	(0.014)	(0.014)
Out of labor force	-0.006	-0.008
	(0.009)	(0.009)
N in family unit	0.004†	0.004†
	(0.002)	(0.002)
Rents	0.003	0.003
	(0.008)	(0.008)
Neither	0.007	0.008
	(0.014)	(0.014)
Number of years between waves=2	0.011	0.010
	(0.013)	(0.013)
Observations	4793	4793

Standard errors in parentheses
† $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

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