Demography (2022) 59(2):433–459 Published online: 7 February 2022
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What Would It Take to Desegregate U.S. Metropolitan Areas? Pathways to Residential Desegregation by Race

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ABSTRACT Patterns of household mobility across neighborhoods reproduce patterns of racial segregation at the metropolitan level. Substantial literature across the social sciences has explored the scale and predictors of household mobility as well as changes in metropolitan residential segregation over time. This study unifies these two strands of inquiry by connecting the sorting of households across neighborhoods to aggregate changes in segregation levels. Using discrete choice models of intrametropolitan mobility and restricted decennial census and American Community Survey data for 1960–2014, I model the correlates of household mobility and identify the counterfactual scenarios under which lower segregation levels can be achieved. The results show that even though the mobility flows of the White, Black, Hispanic, and Asian populations across census tracts have become more similar over time, U.S. metropolitan areas are far from experiencing large drops in segregation.

KEYWORDS Residential mobility • Racial segregation • Discrete choice models

Introduction

Residential segregation by race/ethnicity is a defining feature of U.S. metropolitan areas. Despite some declines over the last 40 years, almost two thirds of Black households and one half of Hispanic households in 2010 would have had to move to achieve complete integration with the White population (Logan and Stults 2011). Segregation's endurance belies broader integrative forces, such as the decline of the most egregious forms of housing discrimination, the liberalization of the White population's attitudes toward integration, and the narrowing of economic gaps across some racial/ethnic groups (Krysan and Crowder 2017). Segregation's endurance at the metropolitan level also contrasts sharply with the high mobility rates among American households. Over the 2005–2010 period, more than one third of all U.S. households moved to a new housing unit (Ihrke and Faber 2012)—a substantial decrease compared with the 1970–2000 period, when five-year mobility rates hovered above 40%. Still, the rate seen in 2005–2010 implies that changing how Americans move to new housing units can have an appreciable impact on segregation levels over a relatively short period.

ELECTRONIC SUPPLEMENTARY MATERIAL The online version of this article (https://doi.org/10.1215/00703370-9737156) contains supplementary material.

Substantial literature across the social sciences has explored the scale and predictors of household geographic mobility as well as the changes in metropolitan segregation levels over time. The household mobility literature has concluded that compared with White households, Black, Hispanic, and Asian households move less frequently to wealthy suburban neighborhoods (Farley and Frey 1994; Frey and Farley 1996; Iceland 2004; Logan et al. 2004). These disparities in neighborhood attainment do not disappear after differences in socioeconomic resources are controlled for, and they are the largest for Black households (Adelman 2005; Alba et al. 2000; Freeman 2000; Logan et al. 1996; South et al. 2008; White and Sassler 2000; Woldoff 2008). The literature on metropolitan-level segregation patterns has shown that Black–White segregation levels have declined modestly over time, with most of the declines occurring in metropolitan areas in the South and the West during the 1970–1990 period (Sander et al. 2018). Segregation remains very high in metropolitan areas in the Midwest and Northeast, where the majority of the urban Black population lives (Logan and Stults 2011). The segregation of the Hispanic and Asian populations from the White population has remained about the same since the 1980s, with greater segregation in metropolitan areas with more Hispanic and Asian residents (Logan and Stults 2011).

This study unifies the household-level neighborhood attainment literature with the metropolitan-level segregation literature to identify the counterfactual scenarios of household geographic mobility under which metropolitan-level segregation would decrease. I find that solely eliminating neighborhood racial composition and its correlates as a basis for sorting across neighborhoods for the White population would not appreciably decrease residential segregation, at least in the short run. I also find that income sorting across neighborhoods is a negligible source of racial residential segregation for all racial/ethnic groups. The largest potential decrease in racial segregation could come from changing the mobility behavior of White households to fully match that of Black, Hispanic, and Asian households, or vice versa. This finding indicates that any policy aimed at decreasing segregation at the metropolitan level must simultaneously undercut sorting at the household level along multiple neighborhood dimensions. It also suggests that the current durable structure of segregation in many U.S. metropolitan areas shapes mobility networks in a way that can preserve segregated neighborhoods even without direct sorting on race or social status.

Background

The literature on residential mobility has tested four complementary theoretical models of residential segregation. The first theoretical perspective—the spatial assimilation model—predicts that as minority groups advance in their socioeconomic standing relative to the White population, they will be able to afford more housing in predominantly White neighborhoods, leading to a decline in racial residential segregation at the metropolitan level (Charles 2003; Crowder and South 2005; Crowder et al. 2006). The second theoretical perspective—the place stratification model—posits that high residential segregation reflects long-standing discriminatory and exclusionary practices in the housing market. Thus, neighborhood segregation is reproduced through social and political processes that hinder the mobility of people of color into resource-rich neighborhoods (Charles 2003; Logan and Alba 1993; Logan

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and Molotch 1987; Ross and Turner 2005). Under the place stratification perspective, metropolitan segregation would decrease with the elimination of discriminatory practices in the housing market. The third theoretical perspective emphasizes the role of preferences for one's neighbors in producing high residential segregation. This perspective posits that the White population's unwillingness to live in neighborhoods that are majority non-White would keep residential segregation high even in the absence of other discriminatory barriers because even small differences in household-level residential preferences can lead to greater metropolitan-level segregation (Clark and Fossett 2008; Schelling 1971).

More recently, Krysan and Crowder (2017) proposed a fourth theoretical approach based on the social networks and information that shape household migration across neighborhoods. They suggested that once high levels of metropolitan segregation are established, residential segregation is perpetuated through the housing search process: racial residential segregation at the metropolitan level begets racially disparate mobility patterns at the household level, which in turn perpetuate segregation at the metropolitan level. Even if discrimination in the housing market were eliminated or socioeconomic characteristics completely converged across racial/ethnic groups, segregation levels would not change until the household migration behaviors across neighborhoods also change (Krysan and Crowder 2017).

Partitioning the contributions of each theoretical explanation of housing segregation into components explained by economic resources, discrimination, preferences, and social networks has remained challenging. Although most studies have acknowledged the complementarity of the mechanisms underpinning segregation, analyses have typically tried to separate the contributions of racial factors from the contributions of socioeconomic resources in the sorting of households across neighborhoods. Sorting on socioeconomic resources is typically assumed to be evidence for the spatial assimilation perspective, whereas sorting on race is assumed to be a combination of discrimination in the housing market and preferences for coethnic neighbors. As Krysan and Crowder (2017) noted, even these assumptions might not be justified because discrimination in the housing market manifests differently depending on households' socioeconomic status (SES), whereas preferences for coethnic neighbors (especially for populations of color) may be the result of anticipated discrimination in White neighborhoods.

Methodologically, research on household geographic mobility has not been able to directly answer the question of what would happen to metropolitan-level segregation if households sorted in different ways across neighborhoods for two reasons: (1) the lack of appropriate data to connect household mobility to metropolitan segregation, and (2) the complexity of appropriately modeling residential choice (Krysan and Crowder 2017; Quillian 2015). It might seem obvious that if, in the long run, income or wealth differences across racial/ethnic groups decreases, discrimination levels drop, or preferences change, so too will metropolitan segregation levels. However, this outcome is not a given. For example, at the metropolitan level, discrimination levels as measured through housing audit studies are very modestly associated with racial segregation (South and Crowder 1998). So, too, are the White population's attitudes toward desegregation, insofar as they can be measured with the General Social Survey (Sander et al. 2018:197).

An important reason why the literature on locational attainment has been unable to directly answer questions about metropolitan-level segregation is that the samples for the surveys it has typically used are too small to predict metropolitan-level

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segregation from estimates of household-level mobility. The link between household-level processes and metropolitan-level segregation, however, is crucial for understanding why segregation in most metropolitan areas has remained the same or declined only slightly over time. As Sampson and Sharkey (2008) argued, social scientists should treat household-level sorting across neighborhoods as a key process to understand population-level inequality. Therefore, it is important to connect micro-level mobility to macro-level segregation.

At the micro level, households tend to move short distances to preserve existing connections to jobs, schools, social networks, and kin (Boyd 2008; Clark and Maas 2015; Dawkins 2006; Kan 2007; Spring et al. 2017). Conditional on homeownership, Black households are less likely to move than White households (South and Deane 1993). Most intrametropolitan movers stay within neighborhoods dominated by their own racial or ethnic group (Crowder et al. 2012). Even though the Black population is more open to living in integrated neighborhoods than the White population, when asked to describe perceptions of potential neighborhood destinations, Black respondents are unfamiliar with majority-White neighborhoods, especially those that are far from majority-Black neighborhoods (Krysan 2002; Krysan and Bader 2007; Krysan and Farley 2002).

At the macro level, household flows across neighborhoods are structured by metropolitan-level characteristics. In metropolitan areas with smaller Black populations, newer housing, and growing economies, all households tend to end up in more integrated neighborhoods (Crowder et al. 2012). Black middle-class households are more likely to be segregated from White middle-class households in metropolitan areas with enough Black middle-class households to form Black middle-class neighborhoods (Bayer et al. 2014). Therefore, different metropolitan areas present different opportunities for desegregation, and metropolitan-level differences in segregation and the patterning of segregated neighborhoods are drivers of segregated mobility networks.

A relatively small but growing literature in the social sciences has demonstrated just how important it is to connect micro-level processes to macro-level patterns in the study of segregation. For example, Bayer and colleagues (2004) showed that for the San Francisco metropolitan area in 1990, household-level socioeconomic characteristics explain much of the observed segregation for the Asian and Hispanic populations, albeit less for the White and Black populations. Crowell and Fossett (2018) estimated that the role of sorting on economic resources between the White and Latino populations is less pronounced in cities with higher levels of White–Latino segregation. Bruch and Swait (2019) showed that stratified housing submarkets in Los Angeles reproduce metropolitan segregation through segregated mobility choices. Bruch and Mare (2006) demonstrated that differences in the functional form of household residential preferences can lead to dramatically different magnitudes of metropolitan-level segregation.

In this article, I add to the growing literature on residential segregation that explicitly considers the linkage between micro-level and macro-level processes in the housing market as a way to determine empirically how amenable metropolitan segregation is to changes in household mobility. I use the insights of the large literature on household-level mobility to derive metropolitan-level residential segregation indexes from household-level mobility data. In doing so, I explore what would happen to racial residential segregation at the metropolitan level if households were to sort differently across neighborhoods on the basis of neighborhood racial composition and neighborhood social status. I conduct several counterfactual scenarios of household

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mobility that either eliminate some neighborhood-level sources of household sorting or change how important these sources of sorting are for different racial/ethnic groups. I also demonstrate the extent to which differences in residential mobility across the largest metropolitan areas in the United States contribute to differences in racial residential segregation.

Methodology

The analysis proceeds in two steps. First, I estimate discrete choice models of the sorting of households across neighborhoods. Second, I predict racial segregation within each U.S. metropolitan area under different counterfactual scenarios of household sorting. I use restricted versions of the 1960, 1970, 1980, 1990, and 2000 decennial census long-form data and five-year 2010–2014 American Community Survey (ACS) data.

The use of discrete choice models within the context of geographic mobility amounts to asking why a household moved to a specific neighborhood or stayed in their current location given all possible alternative destinations. The unit of analysis in the discrete choice models is the possible destination choices that each household could have made, including the choice to remain in their current neighborhood. The dependent variable is coded 1 for the chosen neighborhood and 0 for all other possible choices. The independent variables are the characteristics of actual and potential neighborhood choices and interactions between household and neighborhood characteristics.

Traditional locational attainment models estimate the household-level determinants of mobility into neighborhoods of varying racial or socioeconomic composition. By contrast, discrete choice models estimate the correlates of geographic mobility, where the independent variables represent neighborhood-level characteristics and interactions between neighborhood-level and household-level characteristics (Bruch and Mare 2012). Discrete choice models enable estimation of the correlates of moving to a new neighborhood and staying in one's current neighborhood within the same regression model: information about the reproduction of residential segregation garnered from the choice not to move is just as valuable as that from the choice to move (Bruch and Mare 2012). Discrete choice models also explicitly incorporate how the full distribution of possible destinations influences households' mobility behaviors, which is particularly important given significant variability in the types of neighborhoods across metropolitan areas. Therefore, discrete choice models can properly account for how the marginal distribution of potential neighborhood destinations influences the probability of mobility (Quillian 2015). Lastly, discrete choice models make it computationally possible to aggregate household-level moves to metropolitan-level patterns and directly show how metropolitan patterns of segregation result from household-level flows across neighborhoods (Bruch and Mare 2012).

All the models I use focus on tract in-migration or remaining in one's current tract because the data sets that I use are a series of cross-sections of the population that do not have information on mobile households' tracts of origin. Therefore, this study examines neighborhood-level pull factors that are at play in the sorting of the population. The cross-sectional nature of census data sets is the main trade-off to their large sample sizes.

In the absence of data on neighborhood preferences or the housing search process of households, the estimates of discrete choice models cannot be interpreted as

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capturing household preferences for specific types of tracts and only approximate actual residential mobility. Therefore, the coefficients presented here cannot separate discrimination from preferences and housing search strategies in producing the sorting of the population across tracts. Discrete choice models share these limitations with research in the locational attainment tradition.

Estimation of Discrete Choice Models

I use conditional logistic regression to estimate the discrete choice models. All regressions include household choices regardless of when households moved into their current tract because households most frequently choose not to move (Bruch and Mare 2012). Because of computing constraints, I draw a 20% random sample from each of the data sets that I analyze.[1]

Formally, I model the probability that a household i chose a particular tract j in a metropolitan area m. I assume that tract j is drawn from a choice set ($\mathbf{C}_{im}$) of many possible tract choices within that household's current metropolitan area. The probability of choosing a tract is a function of tract-level covariates, $\mathbf{Z}_{ijm}$, which interact with household-level covariates, $\mathbf{X}_i$. Because conditional logistic models are fixed-effects models, household-level covariates can enter the regressions only as interactions. All covariates contribute to the following random utility function:

$$U_{imj} = \beta\mathbf{Z}_{ijm} + \gamma\mathbf{Z}_{ijm}\mathbf{X}_i + \varepsilon_{ijm},$$

where ε_{ijm} is a random household-, tract-, and metropolitan area–specific term. The probability that household i chooses tract j in metropolitan area m is calculated as follows:

$$p_{ijm} = \frac{\exp(\beta\mathbf{Z}_{ijm} + \gamma\mathbf{Z}_{ijm}\mathbf{X}_i)}{\sum_{k\in C_{im}}\exp(\beta\mathbf{Z}_{ik} + \gamma\mathbf{Z}_{ik}\mathbf{X}_i)}.$$

I accumulate these probabilities across households in the following likelihood function:

$$L = \prod_i\prod_j\prod_m (p_{ijm})^{y_{ijm}}.$$

The outcome variable, y_{ijm}, takes the value of 1 if tract j in metropolitan area m is the destination of household i, and 0 otherwise.

Because every U.S. metropolitan area has at least a few dozen census tracts, estimating this likelihood function can be computationally cumbersome. Therefore, I subsample alternatives within each household's choice set, where each household has a choice set of 5% of potential neighborhoods within their current metropolitan area, with a minimum number of three tracts in each household's choice set.[2] Thus, each household appears in the data set as many times as they have potential tracts from which to choose in their current metropolitan area. Using a random sample

[1] For more details on the sample selection, see the online appendix.

[2] For more details on the creation of the choice set, see the online appendix.

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of potential destinations produces consistent estimates even without a correction for the sampling procedure (Bruch and Mare 2012; Jarvis 2019). My models do not take intermetropolitan out-mobility into account because it is unclear how to specify the model in a way that mirrors the process of intrametropolitan mobility. They do, however, model the correlates of neighborhood sorting for householders who are recent arrivals to their metropolitan area (see the upcoming section on independent variables). I estimate all discrete choice models separately by year and by the race/ethnicity of the household head. Pooling the data generates samples that are computationally impossible to handle. I generated graphs of predicted probabilities to help with comparisons across racial/ethnic groups and across time.

Independent Variables

The independent variables in the discrete choice models correspond to well-established correlates of population sorting across neighborhoods based on tract racial composition, SES, and housing characteristics. First, mobile households are more sensitive to changes in the racial composition of a neighborhood (Ellen 2000; Sampson and Sharkey 2008), and households that already live in a given area may evaluate staying in their current home differently given changes in the composition of nearby tracts (Crowder and South 2008). Thus, I measure tract racial composition through a series of variables capturing the percentage of Black, Hispanic, and Asian households in each tract, as well as changes in these percentages over the last five years within two miles of a focal tract. All models also control for the internal block-level segregation of the White population from the non-White population in each tract because seemingly diverse tracts that have clear internal racial boundaries might be on the path to racial transition (Smith 1998).

The second set of tract-level variables in each model describes tract SES. Following Schachner and Sampson (2020), I create a tract status index variable calculated as the average of a tract's logged median family income and the percentage of tract residents with a bachelor's degree or higher. These two variables are highly correlated, so their inclusion in a single index mitigates multicollinearity concerns.

Third, all models include several characteristics related to housing cost and housing availability, including the average percentile of homeowner and rental costs with respect to the distribution of census-tract costs within each metropolitan area and the percentage of tract units in single-family detached housing. I also control for whether each tract is in a central city because such census tracts offer fewer opportunities for homeownership (Owens 2019). In addition, tracts with more turnover are, by definition, also places that experience greater in-mobility. Therefore, I control for the one-year housing unit turnover rate, calculated as the percentage of households that lived in the tract for less than one year.

All household-level characteristics enter the discrete choice models as interactions with tract-level characteristics. First, I interact all variables that show the racial composition of a tract with an indicator of whether the household head has a married partner of a different race/ethnicity because multiracial households are more likely to move to integrated neighborhoods (Gabriel 2016; Gabriel and Spring 2019; Holloway et al. 2005; Wright et al. 2011). Further, Black intermetropolitan movers,

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in particular, are more likely to move to neighborhoods where they have fewer Black neighbors and have been instrumental in spurring desegregation in metropolitan areas in the South and the West (Sander et al. 2018). I therefore include an indicator of whether the household head is a newcomer to their metropolitan area. In addition, households with school-age children are the driving force behind income segregation in the United States (Owens 2016), and White households with school-age children might be particularly likely to avoid non-White neighborhoods because of perceptions of the quality of schools there (Ellen 2000; Fairlie and Resch 2002; Saporito and Sohoni 2006). Thus, I interact all census-tract racial composition variables with a household indicator of the presence of children who are enrolled in school. My regressions control for whether the household head is foreign-born, given that foreign-born Hispanic and Asian households are more likely to live in neighborhoods with a greater percentage of coethnic households (Iceland and Scopilliti 2008).

All regressions include a series of interactions between the tract status index and dummy variables for quintiles of household income to control for the increasing sorting of higher income households into higher SES tracts (Reardon et al. 2018). All regressions for years after 1980 also include a variable for the logged distance to work for employed household heads. This variable has a value of 0 for those who are retired or unemployed.

Finally, households that have lived at their current residence longer are less likely to move, and White and Hispanic households can more easily remain in higher SES tracts than Black households (South et al. 2005). Black households, especially those with low income, have historically been much more likely to leave majority-White tracts or higher income census tracts (Quillian 2002). To control for such differences, in all regressions, I include a series of interactions between the length of time, measured in years, the household head has lived in their current housing unit and the tract's racial composition and status index.

Counterfactual Scenarios of Residential Segregation by Race Using the Estimated Parameters of the Discrete Choice Models

Because discrete choice models can link household-level geographic mobility to metropolitan-level segregation, they provide the proper computational tools to answer questions about linking micro-level processes to macro-level patterns of inequality. After I estimate the discrete choice models, I generate the predicted probability that each household in the long-form decennial census or the 2010–2014 ACS will choose each tract in its current metropolitan area for each year in the analysis. I then convert predicted mobility rates into expected counts of households in each U.S. metropolitan census tract. Taking advantage of the large sample sizes in the long-form decennial census and the 2010–2014 ACS, I compute segregation indexes based on the expected counts from the discrete choice models.

The counterfactual analyses are based on the following scenarios:

Counterfactual Scenario 1: counts are based on the coefficients of the full discrete choice model.

Counterfactual Scenario 2: counts are based on a model in which the coefficients on tract racial/ethnic composition, the racial/ethnic composition of the surrounding

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area, and all household-level interactions with tract-level racial/ethnic composition are set to 0.

Counterfactual Scenario 3: counts are based on a model in which the coefficients on the tract's status index and interactions between that index and household tenure and income are set to 0.

Counterfactual Scenario 4: counts are based on a model in which I apply the coefficients from the discrete choice models of the Black, Hispanic, and Asian populations to the White population.

Counterfactual Scenario 5: counts are based on a model in which I apply the coefficients from the discrete choice models of the White population to the Black, Hispanic, and Asian populations.

After I generate the predicted counts of households in each census tract under each counterfactual scenario, I compute the index of dissimilarity between the White, Black, Hispanic, and Asian populations for each U.S. metropolitan area.[3]

I use Counterfactual Scenario 1 to evaluate how well the predictions from my models match the observed segregation of households in U.S. metropolitan areas. If my models predict household sorting behavior reasonably well, then the predicted counts from the full model should be good approximations of the observed distribution of the population. I then compare the results from Scenarios 2 and 3 with Scenario 1 to determine what would happen to racial residential segregation if households did not sort across census tracts on the basis of tract racial/ethnic composition or tract status, respectively. Finally, I compare the results from Scenarios 4 and 5 with Scenario 1; these comparisons amount to evaluating what would happen to segregation if households sorted across census tracts in the same way as a different racial/ethnic group.

The index of dissimilarity is defined as follows:

$$D = \frac{1}{2}\Sigma\left|\frac{N_{1i}}{N_1} - \frac{N_{2i}}{N_2}\right|,$$

where N_{1i} and N_{2i} are, respectively, the population of Group 1 and Group 2 in the *i*th tract. N_1 and N_2 are the total populations of Group 1 and Group 2 in the metropolitan area. The index value shows the proportion of Group 1 (or Group 2) that would have to move to a different tract such that each tract in a metropolitan area would have the same composition of Group 1 (or Group 2) as the metropolitan area as a whole (White 1983).

Results

Descriptive Results

Tables 1 and 2 show select descriptive statistics of the types of census tracts to which households moved in 1970, 1990, and 2010–2014.[4] White homeowners and White

[3] My methodology is flexible enough to allow me to compute any index of segregation that has census tract data as its inputs. I chose the index of dissimilarity because of its wide use in the literature on segregation.

[4] A full set of descriptive statistics for all years can be found in the online appendix.

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Table 1 Descriptive statistics for the composition of census tracts where White and Black households moved over time

	1970		1990		2010–2014	
	White Owners (N=323,000)	White Renters (N=681,000)	White Owners (N=507,000)	White Renters (N=963,000)	White Owners (N=300,000)	White Renters (N=620,000)
% White	94.0	90.8	90.8	86.7	83.5	76.8
% Black	2.5	4.0	3.9	5.9	5.5	8.3
% Hispanic	2.9	4.0	3.4	4.7	6.5	8.9
% Asian	0.4	0.9	1.5	2.2	2.8	3.9
% Black Within 2 Miles	3.9	7.6	4.4	7.0	5.9	8.5
% Hispanic Within 2 Miles	2.7	4.0	3.0	4.5	6.3	8.4
% Asian Within 2 Miles	0.4	0.9	1.4	2.0	2.7	3.6
% Households in Poverty	8.6	11.5	6.7	9.3	9.3	13.1
% Single-Family Detached Housing	67.8	44.0	63.9	46.3	65.2	47.4
% of Moves to a Central City Tract	31.0	50.9	26.7	45.2	28.0	47.0
	Black Owners (N=26,000)	Black Renters (N=99,000)	Black Owners (N=34,000)	Black Renters (N=195,000)	Black Owners (N=20,000)	Black Renters (N=156,000)
% White	50.4	34.1	52.8	47.7	44.6	40.2
% Black	45.6	60.4	40.7	43.9	41.0	42.7
% Hispanic	3.3	4.6	4.6	6.1	9.4	11.8
% Asian	0.5	0.7	1.5	2.0	3.1	3.2
% Black Within 2 Miles	34.1	40.6	31.6	33.6	32.9	34.1
% Hispanic Within 2 Miles	3.3	4.7	4.4	5.9	9.3	11.4
% Asian Within 2 Miles	0.5	0.8	1.4	1.9	3.0	3.3
% Households in Poverty	16.9	24.5	13.8	20.0	15.9	21.5
% Single-Family Detached Housing	54.2	28.0	56.9	36.6	56.7	38.0
% of Moves to a Central City Tract	71.8	83.0	51.5	68.6	46.0	63.0

Notes: All tract-level variables are calculated only for households that resided in the tract for more than one year. The number of observations and descriptive statistics are rounded according to census disclosure rules.

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Table 2 Descriptive statistics for the composition of census tracts where Hispanic and Asian households moved over time

	1970		1990		2010–2014	
	Hispanic Owners (N=18,000)	Hispanic Renters (N=69,000)	Hispanic Owners (N=38,000)	Hispanic Renters (N=156,000)	Hispanic Owners (N=37,000)	Hispanic Renters (N=161,000)
% White	74.7	65.4	62.3	55.5	52.2	45.2
% Black	4.9	9.2	7.9	9.9	10.0	12.2
% Hispanic	19.2	23.6	26.3	30.1	31.2	35.1
% Asian	0.9	1.5	2.9	3.9	4.6	5.4
% Black Within 2 Miles	6.5	11.9	8.4	10.4	9.9	11.6
% Hispanic Within 2 Miles	15.3	17.2	20.0	23.7	27.3	29.9
% Asian Within 2 Miles	0.8	1.4	2.7	3.8	4.5	5.4
% Households in Poverty	12.7	17.6	11.8	15.9	14.1	19.1
% Single-Family Detached Housing	59.7	30.9	54.1	34.8	56.8	37.3
% of Moves to a Central City Tract	48.2	66.4	43.6	61.9	41.0	57.0
	Asian Owners (N=2,500)	Asian Renters (N=9,000)	Asian Owners (N=22,000)	Asian Renters (N=48,000)	Asian Owners (N=21,000)	Asian Renters (N=57,000)
% White	68.7	68.5	72.4	67.6	58.8	55.5
% Black	2.6	6.1	5.8	8.3	7.6	10.0
% Hispanic	6.7	7.8	10.0	11.3	14.1	15.0
% Asian	21.6	17.1	11.3	12.3	17.1	16.6
% Black Within 2 Miles	4.2	9.2	6.4	9.4	8.1	10.5
% Hispanic Within 2 Miles	6.4	7.3	9.8	10.8	15.0	15.2
% Asian Within 2 Miles	17.1	12.5	9.3	9.1	14.8	13.0
% Households in Poverty	7.5	12.9	6.0	11.5	8.9	14.7
% Single-Family Detached Housing	59.6	25.3	58.8	32.4	58.9	33.0
% of Moves to a Central City Tract	47.7	70.0	35.2	59.4	44.0	63.0

Notes: All tract-level variables are calculated only for households that resided in the tract for more than one year. The number of observations and descriptive statistics are rounded according to census disclosure rules.

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renters moved, on average, to overwhelmingly White neighborhoods in all years. The strength of this pattern decreased over time but remained high: average figures for 2014 show that White homeowners moved to neighborhoods that were 83% White, whereas White renters moved to neighborhoods that were 77% White. In contrast in 2014, Black, Hispanic, and Asian households, regardless of tenure status, moved to significantly more diverse tracts, where the White population represented only 40% to 75% of the total. White and Asian households were much more likely than Black and Hispanic households to move to neighborhoods with lower poverty levels. White households and Asian homeowner households, on average, were also more likely to move to neighborhoods with a greater percentage of single-family detached housing units; White homeowner households, in particular, were much less likely to move to a central city.

Discrete Choice Models

Table 3 shows conditional logistic regressions of the correlates of household geographic mobility using the 2010–2014 ACS. The table rows first show the main term for each tract characteristic and then the household-level interaction terms with that tract characteristic. Because results across decades confirm the main conclusions of the locational attainment literature and the focus of the study is on the resulting metropolitan-level segregation indexes, I present the regression coefficients based on only the 2010–2014 ACS in the main body of the manuscript. I also present graphs of predicted probabilities for comparisons across time for key independent variables. The regression models based on the 1960–2000 census data are available in the online appendix.

Table 3 shows that the spatial structure of tracts in a metropolitan area is an important correlate of household sorting. For example, White households are less likely to choose a tract with a higher percentage of non-White residents, and they are less likely to do so if the two-mile radius around the tract experienced a recent increase in the percentage of Black, Hispanic, or Asian residents. Consistent with the findings of Ellen (2000) and Crowder and South (2008), changes in the composition of neighboring tracts are important correlates of mobility over and above the composition of a focal census tract.

White households are also more likely to sort into tracts with greater internal segregation—that is, the degree to which the White and non-White populations live in separate census blocks within the same tract. This pattern implies that White households may seek both majority-White tracts and tracts where segregation exists at the subtract level. These general patterns of sorting on race also hold for the Black, Hispanic, and Asian populations, who are more likely to enter neighborhoods with a higher percentage of coethnic households; further, I find no evidence that these groups avoid one another when sorting across tracts.

Life course and demographic factors are important correlates of household sorting across tracts. White households with children in school are less likely to choose a neighborhood as the percentage of Black, Hispanic, and Asian residents increases. On the other hand, if a White householder is married to a person of a different race/ethnicity, that household is more likely to sort into a neighborhood with a higher percentage of Black, Hispanic, or Asian households. The reverse is also true: Black,

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Table 3 Conditional logit regressions of geographic mobility by race/ethnicity, 2010–2014 ACS

	White Households	Black Households	Hispanic Households	Asian Households
Tract: % Black (ref. = % non-Hispanic White)	–0.006***	0.060***	0.008***	0.014***
	(0.001)	(0.001)	(0.001)	(0.003)
× Whether householder is married to partner of different race/ethnicity	0.012***	–0.020***	–0.008***	–0.002
	(0.001)	(0.002)	(0.002)	(0.004)
× Whether householder is a newcomer to metropolitan area	0.003***	–0.009***	–0.000	–0.001
	(0.001)	(0.001)	(0.001)	(0.002)
× Whether householder is foreign-born	0.003*	–0.000	0.001	–0.003
	(0.001)	(0.001)	(0.001)	(0.003)
× Whether household has children in school	–0.013***	0.003***	0.003*	–0.002
	(0.001)	(0.001)	(0.001)	(0.003)
× Whether household owns home	–0.004***	0.007***	0.003*	0.005
	(0.001)	(0.001)	(0.001)	(0.003)
× Nonmover household	–0.074***	–0.097***	–0.075*	–0.053***
	(0.012)	(0.012)	(0.035)	(0.008)
Tract: % Hispanic	–0.003*	0.012***	0.045***	0.010***
	(0.001)	(0.002)	(0.001)	(0.003)
× Whether householder is married to partner of different race/ethnicity	0.019***	0.006*	–0.022***	–0.008*
	(0.001)	(0.003)	(0.001)	(0.003)
× Whether householder is a newcomer to metropolitan area	–0.005***	–0.004	–0.013***	–0.014***
	(0.001)	(0.002)	(0.001)	(0.002)
× Whether householder is foreign-born	0.007***	0.002	0.014***	0.008***
	(0.001)	(0.002)	(0.001)	(0.002)
× Whether household has children in school	–0.005***	0.005**	0.006***	–0.007**
	(0.001)	(0.001)	(0.001)	(0.003)
× Whether household owns home	–0.003***	0.007**	–0.004**	0.004
	(0.001)	(0.002)	(0.001)	(0.002)
× Nonmover household	0.037**	0.064***	0.124***	–0.002
	(0.012)	(0.014)	(0.032)	(0.042)

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Table 3 (continued)

	White Households	Black Households	Hispanic Households	Asian Households
Tract: % Asian	–0.019***	0.008**	0.002	0.073***
	(0.001)	(0.003)	(0.002)	(0.003)
× Whether householder is married to partner of different race/ethnicity	0.017***	0.002	–0.010**	–0.036***
	(0.002)	(0.006)	(0.003)	(0.005)
× Whether householder is a newcomer to metropolitan area	0.011***	0.014**	0.006*	–0.010***
	(0.002)	(0.004)	(0.003)	(0.002)
× Whether householder is foreign-born	0.027***	0.021***	0.007***	0.019***
	(0.002)	(0.004)	(0.002)	(0.002)
× Whether household has children in school	–0.018***	–0.005	–0.000	0.005*
	(0.002)	(0.003)	(0.002)	(0.002)
× Whether household owns home	–0.007***	0.006	–0.001	–0.006**
	(0.002)	(0.005)	(0.003)	(0.002)
× Nonmover household	0.207*	–0.106***	–0.427	0.020
	(0.085)	(0.012)	(0.325)	(0.011)
Tract: Change in % Black Within 2 Miles Over the Last 5 Years	–0.016***	0.039***	0.013***	0.012*
	(0.002)	(0.003)	(0.003)	(0.006)
Tract: Change in % Hispanic Within 2 Miles Over the Last 5 Years	–0.015***	0.014***	0.033***	0.033***
	(0.002)	(0.004)	(0.003)	(0.005)
Tract: Change in % Asian Within 2 Miles Over the Last 5 Years	–0.009**	–0.018*	–0.009	0.050***
	(0.003)	(0.007)	(0.006)	(0.006)
Tract: Internal Segregation	0.133***	0.276***	0.071	0.006
	(0.034)	(0.062)	(0.065)	(0.116)
Tract: Status Index	–0.460***	–0.564***	–0.531***	–0.504***
	(0.025)	(0.029)	(0.033)	(0.043)
× Household below 20th percentile of income distribution (ref.)				
× Household in 21st–40th percentile of income distribution	0.046	0.224***	0.065*	–0.096*
	(0.024)	(0.028)	(0.033)	(0.047)
× Household in 41st–60th percentile of income distribution	0.183***	0.463***	0.296***	0.047
	(0.021)	(0.026)	(0.028)	(0.042)
× Household in 61st–80th percentile of income distribution	0.375***	0.726***	0.557***	0.250***
	(0.021)	(0.030)	(0.030)	(0.041)

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Table 3 (continued)

	White Households	Black Households	Hispanic Households	Asian Households
× Household in 81st+ percentile of income distribution	0.799***	1.046***	0.914***	0.657***
	(0.022)	(0.044)	(0.036)	(0.045)
× Household has children in school	–0.038*	0.080**	0.036	0.038
	(0.016)	(0.027)	(0.028)	(0.040)
× Householder has college degree	0.519***	0.461***	0.643***	0.589***
	(0.010)	(0.022)	(0.021)	(0.028)
× Nonmover household	–0.050	0.934***	1.126***	0.068
	(0.148)	(0.106)	(0.159)	(0.050)
Log of Distance to Work	–0.395***	–0.371***	–0.474***	–0.489***
	(0.004)	(0.009)	(0.013)	(0.018)
Tract: % Single-Family Detached Housing	–0.008***	0.001	–0.002***	–0.011***
	(0.000)	(0.001)	(0.001)	(0.001)
× Whether household owns home	0.030***	0.038***	0.032***	0.035***
	(0.000)	(0.001)	(0.001)	(0.001)
Tract: Central City	–0.023*	0.075***	0.030	–0.024
	(0.010)	(0.020)	(0.018)	(0.033)
× Whether household owns home	–0.151***	–0.259***	–0.242***	–0.007
	(0.019)	(0.060)	(0.044)	(0.059)
Tract: Average Percentile of Homeowner and Rental Costs	0.000	–0.008***	–0.004***	0.010***
	(0.000)	(0.001)	(0.001)	(0.001)
Tract: One-Year Household Turnover	0.035***	0.043***	0.036***	0.035***
	(0.001)	(0.001)	(0.001)	(0.001)
Tract: Log of Total Households	1.114***	1.142***	1.053***	1.120***
	(0.009)	(0.018)	(0.018)	(0.028)
Nonmover Household (1+ year at current unit) × Current Tract Indicator	31.30***	31.05***	30.22***	29.89***
	(0.173)	(0.099)	(0.220)	(0.188)
Nonmover Household (10+ years at current unit) × Current Tract Indicator	0.276***	0.171	–0.364	0.288***
	(0.066)	(0.125)	(0.360)	(0.074)
Number of Observations	43,600,000	8,794,000	11,410,000	5,243,000
Log-Likelihood	–5,450,000	–1,531,000	–1,839,000	–634,000

Notes: Standard errors are shown in parentheses. The number of observations and coefficients are rounded according to census disclosure rules.

$*p<.05$; $**p<.01$; $***p<.001$

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Hispanic, and Asian householders are more likely to sort into Whiter neighborhoods if they are married to a partner of a different race/ethnicity. Hispanic and Asian households are also more likely to select a neighborhood with a higher percentage of coethnic households if the household head is foreign-born.

Factors such as homeownership and distance to work operate in the same direction across racial/ethnic groups: households move less frequently to central city neighborhoods if they own a home and move less frequently to neighborhoods that are farther from their workplace. Sorting on tract status—especially for high-income, college-educated households—is another prominent pattern that holds across all racial/ethnic groups.

The large size of the coefficient on the interaction between the indicator for the household having lived at their current residence for more than one year and the indicator for that household's current tract confirms that households are much more likely to remain at their current place of residence than to move. Black and Hispanic nonmover households are more likely to remain in their current place of residence as tract status increases. That interaction is not statistically significant for White and Asian households, but it becomes positive and significant when I remove the interaction between tract status and household income from the models. These findings suggest that household income for Black and Hispanic households is not a good indicator of household wealth, which might allow households to remain in higher status tracts longer. Another notable interaction coefficient with household nonmover status is that with tract percentage Black. For all groups, this interaction is negative and larger than other interactions with household characteristics. This finding suggests that households are less likely to stay in neighborhoods with a higher percentage of Black residents regardless of the race of the household head.

How have patterns of sorting changed over time? Following Logan and Shin (2016), I address this question by computing the ratio of the predicted conditional probability of living in a census tract given that tract's racial/ethnic composition or tract status divided by the probability of random placement within that household's choice set. These conditional probabilities adjust for changes over time in the neighborhood distribution in each household's choice set, thereby capturing changes in neighborhood selection net of changes in the distribution of possible destination tracts.

Figure 1 shows that Black, Hispanic, and Asian households have become more likely to live in a neighborhood with a higher percentage of White residents. Changes over time are the most pronounced for the Black population, especially for the 1970–1990 period—the period when Black–White metropolitan segregation declined the most in the last 50 years. However, even in 2014, Black households were almost two times more likely to sort into tracts where the White population was less than 20% and about one half as likely to sort into tracts where the White population was more than 80%, compared with picking a random tract. The pattern for Hispanic and Asian households follows an inverted-U shape: households are most likely to select tracts that are in the middle of the percentage White distribution. The changes over time for the White population have pushed this group to select tracts with a somewhat lower percentage of White residents, but White households remain more likely to sort into majority-White tracts.

In terms of the sorting on tract status, the Black population again changed the most markedly over time, especially between 1970 and 1980 (Figure 2). Even with these changes, however, Black households are much more likely to sort into lower status tracts. The same is true for Hispanic households. On the other hand, White

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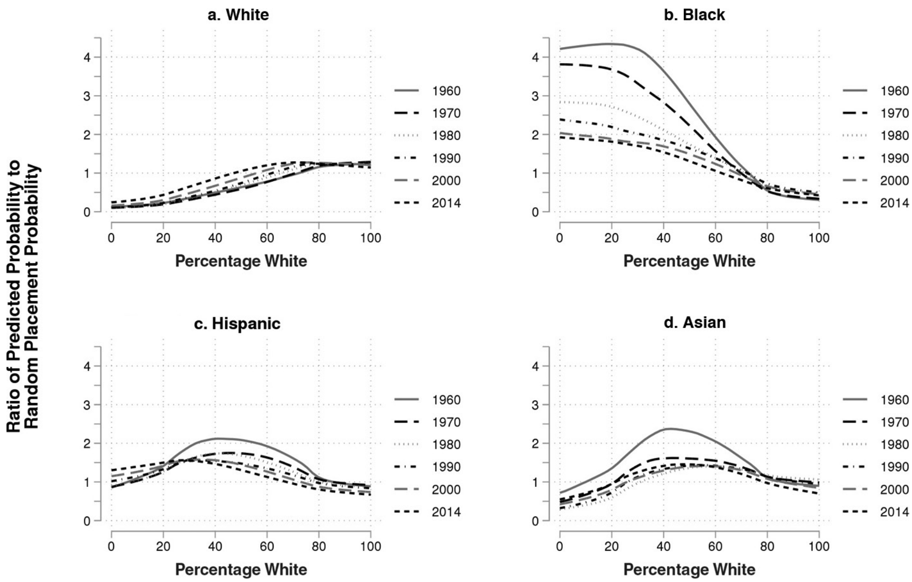

Fig. 1 Conditional predicted probability of living in a given census tract (ratio to random placement), by census tract percentage White, year, and race/ethnicity of householder (local polynomial smoothed curves)

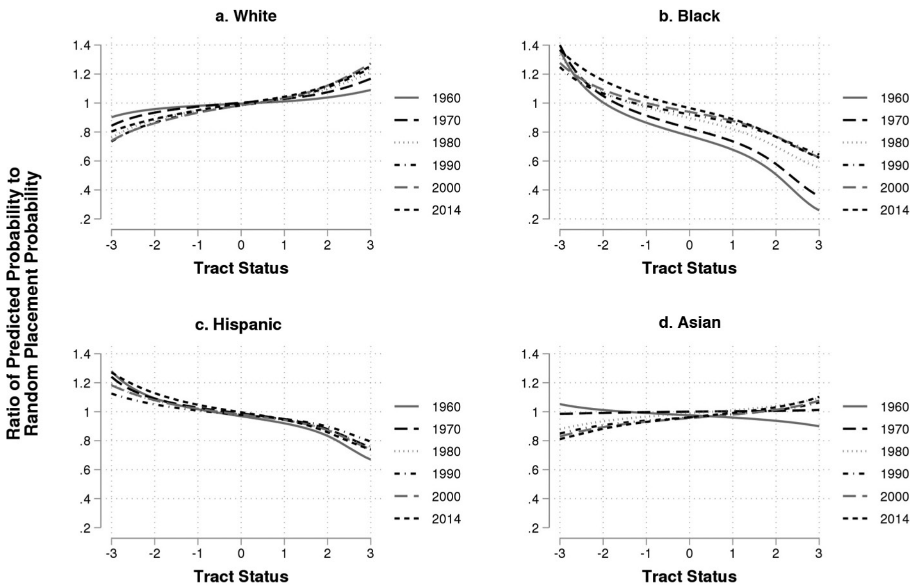

Fig. 2 Conditional predicted probability of living in a given census tract (ratio to random placement), by census tract status, year, and race/ethnicity of householder (local polynomial smoothed curves)

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Table 4 Weighted average of the index of dissimilarity for all metropolitan areas, counterfactual scenarios for White households

	Observed D	Counterfactual Scenario 1: Full Model	Counterfactual Scenario 2: Tract Race Coefficients and Interactions With Tract Race Set to 0	Counterfactual Scenario 3: Tract Status Coefficients and Interactions of Tract Status With Tenure and Income Set to 0	Counterfactual Scenario 4: Coefficients From Model for the Black, Hispanic, or Asian Population Used to Predict Mobility of the White Population
Black–White Index of Dissimilarity					
1960	.80	.81	.78	.81	.65
1970	.80	.81	.78	.80	.68
1980	.73	.73	.71	.73	.61
1990	.69	.68	.66	.68	.60
2000	.65	.65	.63	.65	.57
2010–2014	.69	.69	.69	.69	.63
Hispanic–White Index of Dissimilarity					
1960	.51	.51	.49	.51	.43
1970	.47	.47	.45	.47	.41
1980	.50	.50	.47	.49	.43
1990	.49	.48	.46	.48	.43
2000	.49	.49	.47	.49	.45
2010–2014	.56	.56	.55	.55	.51
Asian–White Index of Dissimilarity					
1960	.58	.59	.55	.59	.49
1970	.52	.53	.51	.52	.46
1980	.43	.43	.42	.43	.38
1990	.42	.42	.41	.42	.38
2000	.43	.43	.42	.43	.40
2010–2014	.48	.47	.46	.47	.43

households have become somewhat more likely to live in higher status tracts. This trend is consistent with previous research documenting the increasing concentration of affluence over time (Owens 2016; Reardon and Bischoff 2011). The direction of the relationship has changed for Asian households, which became more likely to select higher status neighborhoods starting in 1980.

Counterfactual Scenarios of Residential Segregation

Tables 4 and 5 show observed and counterfactual indexes of dissimilarity at the metropolitan level based on the discrete choice models. Specifically, Table 4 shows the observed and counterfactual index of dissimilarity based on counterfactual scenarios for the White population. Table 5 shows the observed and counterfactual index of dissimilarity for the Black, Hispanic, and Asian populations.

Counterfactual Scenario 1 predicts residential segregation by race/ethnicity using the full discrete choice models. The discrete choice regressions predict the average

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Table 5 Weighted average of the index of dissimilarity for all metropolitan areas, counterfactual scenarios for Black, Hispanic, and Asian households

	Observed D	Counterfactual Scenario 1: Full Model	Counterfactual Scenario 2: Tract Race Coefficients and Interactions With Tract Race Set to 0	Counterfactual Scenario 3: Tract Status Coefficients and Interactions of Tract Status With Tenure and Income Set to 0	Counterfactual Scenario 5: Coefficients From Model for the White Population Used to Predict the Mobility of the Black, Hispanic, or Asian Population
Black–White Index of Dissimilarity					
1960	.80	.79	.65	.79	.62
1970	.80	.80	.69	.79	.66
1980	.73	.73	.63	.73	.59
1990	.69	.68	.60	.68	.57
2000	.65	.65	.57	.64	.54
2010–2014	.69	.68	.62	.68	.59
Hispanic–White Index of Dissimilarity					
1960	.51	.52	.43	.55	.37
1970	.47	.47	.40	.50	.36
1980	.50	.50	.43	.50	.38
1990	.49	.49	.44	.50	.40
2000	.49	.49	.45	.49	.41
2010–2014	.56	.55	.51	.54	.47
Asian–White Index of Dissimilarity					
1960	.58	.55	.49	.55	.46
1970	.52	.48	.44	.49	.42
1980	.43	.39	.35	.39	.33
1990	.42	.40	.36	.40	.33
2000	.43	.42	.38	.42	.36
2010–2014	.48	.47	.42	.46	.36

national segregation levels quite accurately and thus present a reasonable model of sorting across neighborhoods. For example, the average population-weighted Black–White index of dissimilarity in the 2010–2014 ACS is .69, and the predicted index is also .69.

Counterfactual Scenario 2 in Table 4 shows what would happen to residential segregation if the coefficients from the discrete choice models on the racial composition of a tract, the racial composition of the surrounding area, and all household-level interactions with tract-level racial composition are set to 0. This scenario estimates what would happen to segregation if households did not sort across tracts on the basis of tract racial/ethnic composition and other factors correlated with such composition for which I could not control owing to data limitations. For example, households might use tract racial/ethnic composition as a proxy for other tract characteristics, such as school quality, crime, and the future trajectory of property values (Ellen 2000). The small differences between Scenario 1 and Scenario 2 in Table 4 imply that at least in the short run, eliminating this source of sorting for the White population would not lead to any substantial desegregation at the metropolitan level.

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Sorting on tract racial/ethnic composition, however, is a more pronounced factor in the segregation of Black, Hispanic, and Asian households (see Table 5). For example, in the 2010–2014 ACS, the difference between Scenario 1 and Scenario 2 for the Black population is 6 points. The models in this study cannot evaluate the precise mechanism behind these findings because I do not have access to data on preferences or neighborhood search strategies; nor can the models evaluate the long-run implications of sorting on tract racial/ethnic composition. However, the results are consistent with previous findings on housing searches showing that Black households are unfamiliar with majority-White neighborhoods and fear potential hostility in such neighborhoods (Krysan and Bader 2007, 2009; Krysan et al. 2009). The results are also consistent with findings showing that existing levels of segregation coupled with short-distance moves make Black and Hispanic households' housing choices highly clustered around areas where Black and Hispanic households are already overrepresented (Bruch and Swait 2019). Audit studies of discrimination in the housing market have demonstrated that real estate agents' steering of the Black population has increased over time (Oh and Yinger 2015) and that housing agents are more likely to deviate from a Black household's initial request to inspect a particular house than from a White household's request (Ondrich et al. 2003). Taken together, the findings for Counterfactual Scenario 2 shown in Tables 4 and 5 imply that the housing market limits the options of Black and Hispanic households, thus producing stronger sorting on tract racial/ethnic composition for Black and Hispanic households than for White households.

The results for Counterfactual Scenario 2 in Table 5 also imply that the barriers to desegregation for the Black, Hispanic, and Asian populations from the White population have decreased over time. For example, the difference between Counterfactual Scenario 1 and Counterfactual Scenario 2 for 1960 is .14 points for the Black population, .10 points for the Hispanic population, and .06 points for the Asian population. The respective numbers using the 2010–2014 ACS are .06, .04, and .05, respectively. These changes show that over time, non-White households have started to move in ways that make sorting on tract race/ethnicity and its correlates less consequential for metropolitan-level segregation.

Counterfactual Scenario 3 in Tables 4 and 5 shows that sorting on tract status is not a large source of racial residential segregation for any group in the analysis. These results are in line with previous research showing that Black–White segregation across categories of income, education, and occupation is often as high as the overall segregation measure for the Black population (Farley 1995; Fischer 2003; Iceland et al. 2005; Massey and Denton 1993; Massey and Fischer 1999). In additional counterfactual analyses available upon request, I also estimated what would happen to racial segregation if (1) the interactions between all tract characteristics and whether the household has children in school and (2) the variable for distance to work were all set to 0. The estimates for both counterfactual scenarios were within .01 points of the results for Counterfactual Scenario 1.

Instead, the largest potential decrease in racial segregation would result from changing the neighborhood sorting behavior of White households so that it matches the sorting behavior of non-White households, or vice versa. The results from Counterfactual Scenarios 4 and 5 (shown in Tables 4 and 5, respectively) apply the coefficients from the discrete choice models for the Black, Hispanic, and Asian populations

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to the White population, and vice versa. For 2014, the difference between Scenario 1 and Scenario 4 for the White population is 6 points for the Black–White index of dissimilarity, 5 points for the Hispanic–White index of dissimilarity, and 4 points for the Asian–White index of dissimilarity (Table 4). The corresponding numbers for the difference between Scenarios 1 and 5 are 9, 8, and 11 points (Table 5). As with the differences between Scenario 1 and Scenario 2, the differences between Scenario 1 and either Scenario 4 or Scenario 5 decreased over time for the Black and Hispanic populations, pointing to the narrowing of the differences in sorting across neighborhoods for households of different racial/ethnic groups. They also suggest that the tract-level sorting of the population is far from disrupting current patterns of racial residential segregation.

All numbers in Tables 4 and 5 show national-level averages for the index of dissimilarity. What are the comparative figures for individual metropolitan areas? I use the national-level discrete choice models to predict segregation levels in the top 20 metropolitan areas by population in the 2010–2014 ACS. As Table 6 shows, the national-level discrete choice models predict observed segregation levels in most of these metropolitan areas quite accurately. The predictions deviate the most in areas where one group is a small percentage of the total population (e.g., Black households are about 7% of San Diego's population; Hispanic households are about 3% of the St. Louis population). Even in these metropolitan areas, the counterfactual prediction for the White population is within .01 points of observed values, whereas the counterfactual prediction for the non-White population underpredicts the observed segregation levels. Evaluating the differences in household sorting for individual metropolitan areas is beyond the scope of this study. However, the results in Table 6 suggest that once differences in the metropolitan distribution of potential tract destinations are taken into account, the household-level correlates of mobility and sorting across tracts are very similar in large metropolitan areas, where a substantial proportion of the non-White population lives.

Discussion

Opportunities for mobility across neighborhoods in the United States are still shaped by profound structural barriers in the housing market, with racial/ethnic groups moving within distinct housing submarkets (Bruch and Swait 2019; Crowder et al. 2012; Sampson and Sharkey 2008). This study quantifies the extent to which changing how households sort across neighborhoods would change metropolitan-level housing segregation in the short term. A long-standing question in the literature on residential sorting in U.S. metropolitan areas regards the relative importance of race/ethnicity, income, and other factors in producing segregated mobility networks. Addressing this question, I predict what would happen at the metropolitan level if either sorting on a particular tract characteristic were eliminated or the importance of that characteristic for household sorting changed. I show that eliminating sorting on neighborhood racial/ethnic composition and factors correlated with it for the White population would not produce appreciable declines in residential segregation, at least in the short term. As a growing group of scholars have noted, segregation in the United States has reached self-sustaining levels: existing segregation begets future segregation through

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Table 6 Index of dissimilarity for the top 20 metropolitan areas by population, 2010–2014 ACS

	Black–White Index of Dissimilarity			Hispanic–White Index of Dissimilarity			Asian–White Index of Dissimilarity		
	Observed	Counterfactual Scenario 1: Full Model, White Households	Counterfactual Scenario 1: Full Model, Black Households	Observed	Counterfactual Scenario 1: Full Model, White Households	Counterfactual Scenario 1: Full Model, Hispanic Households	Observed	Counterfactual Scenario 1: Full Model, White Households	Counterfactual Scenario 1: Full Model, Asian Households
Atlanta	.58	.58	.59	.47	.47	.45	.49	.49	.46
Baltimore	.64	.65	.65	.44	.44	.39	.47	.47	.43
Boston	.66	.66	.62	.60	.60	.56	.47	.46	.45
Chicago	.76	.76	.75	.54	.54	.52	.46	.46	.41
Dallas	.57	.56	.57	.47	.46	.48	.48	.48	.45
Detroit	.74	.74	.75	.47	.48	.41	.54	.54	.46
Houston	.61	.60	.61	.50	.49	.51	.49	.49	.47
Los Angeles	.68	.67	.65	.59	.58	.59	.46	.46	.47
Miami	.65	.64	.65	.59	.59	.59	.44	.44	.39
Minneapolis	.56	.55	.54	.45	.45	.40	.45	.45	.43
New York	.77	.77	.76	.60	.60	.60	.51	.51	.50
Philadelphia	.68	.68	.68	.55	.55	.52	.44	.44	.40
Phoenix	.48	.48	.45	.47	.47	.47	.42	.41	.37
Riverside–San Bernardino	.47	.46	.44	.42	.42	.43	.46	.45	.39
St. Louis	.71	.71	.71	.41	.40	.35	.53	.53	.43
San Diego	.53	.52	.49	.46	.47	.46	.47	.47	.44
San Francisco	.63	.63	.60	.45	.46	.45	.43	.43	.44
Seattle	.50	.50	.47	.34	.33	.32	.38	.37	.37
Tampa	.57	.57	.57	.43	.43	.42	.46	.46	.39
Washington, D.C.	.62	.62	.61	.44	.45	.43	.39	.39	.38

Note: Metropolitan areas follow Core-Based Statistical Area (CBSA) definitions.

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segregated household mobility networks that can operate even in the absence of discrimination or strong preferences for same-race neighbors (Krysan and Crowder 2017). Short moves, moves that are tied to a job location or social networks, or moves to neighborhoods with which a household is familiar reproduce segregation. This is not to say that race or ethnicity is not important in the mobility flows of households. On the contrary, decades of public and private racist practices in the housing market have created the conditions under which high levels of racial segregation can reproduce themselves at the metropolitan level without direct sorting on tract racial composition being an outsized driver of segregation at the metropolitan level.

From a theoretical perspective, the counterfactual scenarios presented emphasize the need to rethink assumptions about the extent of metropolitan-level desegregation that could result from changes in individual-level mobility, especially if those changes occur along a single neighborhood dimension. Where households move is simultaneously predicated upon many neighborhood characteristics (Emerson et al. 2001; Quillian 2015; Swaroop and Krysan 2011). Because majority-White tracts tend to have more affluent residents and more expensive housing and tend to be near other majority-White tracts, solely eliminating sorting on neighborhood racial composition may result in surprisingly small declines in segregation if households continue to churn within tracts that are close to one another (Krysan and Crowder 2017; Quillian 2015).

The counterfactual scenarios in this study also call for reevaluating the implications of the dominant theoretical perspectives of segregation for metropolitan-level desegregation. If segregation is not only an outcome but also a driver of segregated mobility networks, then analyses of household-level mobility need to attend to how metropolitan-level structure reproduces itself through its effects on household sorting (Krysan and Crowder 2017; Sampson and Sharkey 2008). This notion implies that rather than conducting tests to adjudicate between the primacy of household-level racial factors or socioeconomic resources in producing disparate mobility outcomes, segregation scholars need to attend to both the ecological context in which household mobility occurs and the simultaneous functioning of multiple neighborhood attributes that produce durable segregation.

From a policy perspective, potential initiatives aimed at dismantling segregation must contend with the fact that changing segregated patterns of mobility might mean changing several dimensions of sorting across neighborhoods simultaneously. For instance, consider the current debate around municipal zoning regulations and the fight for the expansion of affordable housing in suburban neighborhoods. Given that sorting on tract status is not a large source of racial segregation, the impacts of zoning policy changes on desegregation remain unclear unless such policies also incentivize mobility changes that produce desegregation by race. Policy practitioners have also advocated for an expansion of voucher mobility programs that provide households with housing search assistance and financial support for mobility costs (Bergman et al. 2020; DeLuca and Rosenblatt 2017). Such mobility programs have been successful in producing integrative moves precisely because they have attended to the multiple "tethers" that pull Black and Hispanic households to familiar neighborhoods (Krysan and Crowder 2017) by providing emotional and financial support to movers and brokering the process with landlords (DeLuca and Rosenblatt 2017). If these types of programs can help Black and Hispanic households for whom eliminating sorting on neighborhood racial composition would produce a larger drop in metro-level

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segregation, then racial/ethnic segregation might decline over a short period with a sufficient number of integrative moves.

The analyses in this study have several limitations that should be addressed in further research. First, I could not control for the distance that households moved. I also did not have access to data showing where households looked for housing. In the absence of such data, the estimates presented here may overstate the potential for desegregation because they are based on the assumption that households could consider any neighborhood in their current metropolitan area. Future research could use a longitudinal data set, such as the Panel Study of Income Dynamics, to build discrete choice models that include covariates describing movers' origin tracts and the residential locations of close kin. The coefficients from these models can then feed into simulations of residential segregation using the long-form decennial census or ACS data sets used here. In addition, because my counterfactual scenarios are based on population sorting over a single year, they cannot evaluate the long-term potential for desegregation. A simulation that extends the mobility of the population over multiple years would be able to demonstrate what will happen to segregation in the long run. Future research should also consider more explicitly how the ecological structure of metropolitan areas plays into households' mobility processes. For example, using the methodology outlined in this study, researchers can compare specific metropolitan areas that experienced desegregation over time with those that did not; they can create metro-specific neighborhood choice sets for households using local knowledge of how the housing market operates or information on the geographic boundaries of school districts and municipalities. Examining how the results change under different assumptions of where households search for housing and the role of institutions, such as schools, in those searches could elucidate the mechanisms behind population sorting based on race/ethnicity and socioeconomic resources. ■

Acknowledgments Any opinions and conclusions expressed herein are the author's and do not necessarily represent the views of the U.S. Census Bureau. This research was performed at a Federal Statistical Research Data Center under FSRDC Project Number 1712. All results have been reviewed to ensure that no confidential information is disclosed. The author acknowledges the CUNY Faculty Fellowship Publication Program members, the CUNY Institute for Demographic Research workshop attendees, three anonymous reviewers, and the Editor of *Demography* for their thoughtful comments on the manuscript. The author also thanks Ben Jarvis for graciously providing Stata code and guidance with the implementation of the discrete choice models, as well as Shirley Liu for her support and guidance at the New York Federal Statistical Research Data Center. This research was generously supported by the CUNY-PSC program and the CUNY Faculty Fellowship Publication Program. The New York Federal Statistical Research Data Center is supported by the contributions of member colleges, universities, and social science research organizations. The center also received support from the National Science Foundation (grants SEC-0322902 and ITR-0427889).

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