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Metropolitan Heterogeneity and Minority Neighborhood Attainment: Spatial Assimilation or Place Stratification?

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Abstract

Using geo-referenced data from the Panel Study of Income Dynamics, in conjunction with decennial census data, this research examines metropolitan-area variation in the ability of residentially mobile blacks, Hispanics, and whites to convert their income into two types of neighborhood outcomes—neighborhood racial composition and neighborhood socioeconomic status. For destination tract racial composition, we find strong and near-universal support for the "weak version" of place stratification theory; relative to whites, the effect of individual income on the percent of the destination tract population that is non-Hispanic white is stronger for blacks and Hispanics, but even the highest earning minority group members move to tracts that are "less white" than the tracts that the highest-earning whites move to. In contrast, for moves into neighborhoods characterized by higher levels of average family income, we find substantial heterogeneity across metropolitan areas in minorities' capacity to convert income into neighborhood quality. A slight majority of metropolitan areas evince support for the "strong version" of place stratification theory, in which blacks and Hispanics are less able than whites to convert income into neighborhood socioeconomic status. However, a nontrivial number of metropolitan areas also evince support for spatial assimilation theory, where the highest-earning minorities achieve neighborhood parity with the highest-earning whites. Several metropolitan-area characteristics, including residential segregation, racial and ethnic composition, immigrant population size, poverty rates, and municipal fragmentation, emerge as significant predictors of minority-white differences in neighborhood attainment.

Keywords

residential attainment; neighborhood inequality; segregation; racial stratification; ethnic stratification

For many households attaining residence in a safe neighborhood with adequate housing and good schools is an important objective (Briggs, Popkin, and Goering 2010). However, in urban areas throughout the United States, the bulk of these valued residential amenities tend to be located in predominately white neighborhoods to which racial and ethnic minorities have limited access. A large body of work documents the extent to which racial minorities are residentially segregated from whites (Farley and Frey 1994; Frey and Farley 1996;

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Iceland 2004; Logan, Stults and Farley 2004; Massey and Denton 1993), and these racial disparities in neighborhood attainment tend to persist even after accounting for individual differences in socioeconomic resources (Adelman 2005; Alba, Logan, and Stults 2000b; Bayer, McMillan, and Rueben 2004; Freeman 2000; Logan, Alba, and Leung 1996; South, Crowder, and Pais 2008; White and Sassler 2000; Woldoff 2008). Further research suggests that a key reason for these persistent neighborhood inequalities is that minority groups, especially blacks, have difficulty converting their socioeconomic resources into housing located in whiter, wealthier, and suburban neighborhoods (Alba and Logan 1991; 1993; Crowder, South, and Chavez 2006; Logan and Alba 1993). Although high-status African Americans are more segregated than comparable Hispanics or Asians from whites (Iceland and Wilkes 2006), social class may have become a more salient predictor of blacks' locational attainment over recent decades (Iceland, Sharpe, and Steinmetz 2005; cf., Freeman 2008).

Building from this tradition of neighborhood attainment research, this study assesses the extent to which two major minority groups in the United States, blacks and Hispanics, attain neighborhood environments that are commensurate with their socioeconomic status (SES) across a range of U.S. metropolitan areas. Prior work in this area focuses primarily on individual and household-level characteristics associated with attaining residence in neighborhoods of better or worse quality (e.g., Alba and Logan 1993). We know that metropolitan areas vary substantially in the ecological structures that shape the residential options for minorities (e.g., Farley and Frey 1994; Logan et al. 2004; South et al. 2008), why these structures affect racial and ethnic differences in neighborhood quality is not well understood. This research fills this void by examining how macro-level social, economic, and ecological structures differentially affect the ability of whites and minorities to convert their socioeconomic status into advantageous residential locations.

This study advances research in this area in three specific ways. First, we determine if (and how much) the effect of socioeconomic status on neighborhood outcomes varies across metropolitan areas for whites, blacks, and Hispanics. Second, we determine which (if any) metropolitan-area characteristics explain variation in the effect of individual SES on neighborhood outcomes across metropolitan areas, and we assess whether these effects are different for minorities compared to whites. Third, we compare the overall pattern of effects across two commonly studied neighborhood outcomes: (1) the percentage of the neighborhood population that is non-Hispanic white; and (2) the average neighborhood income level. The first objective is central to our understanding of the range and extent of racial and ethnic inequality in the locational attainment process. The second and third objectives will inform and extend existing locational attainment theories that speak to the literatures on neighborhood racial assimilation and minorities' access to affluent neighborhoods.

Our findings suggest that the processes of neighborhood attainment—and especially minorities' abilities to convert their incomes into neighborhood quality and spatial proximity to whites—vary considerably across metropolitan areas. The results for neighborhood income are particularly intriguing, because they imply that different metropolitan areas conform to distinct and competing theoretical models of minority locational attainment. We also find that several metropolitan-area characteristics, such as levels of residential segregation and poverty, condition minorities' ability to convert income into neighborhood attributes. Overall, our results indicate that patterns of locational attainment are substantially more place specific than extant theorizing acknowledges, and our conclusions call for the elaboration of current theoretical models to accommodate this variation.

Background and Hypotheses

Three theoretical models are commonly used to study the ability of racial minorities to convert their socioeconomic resources into advantageous neighborhood locations (Logan and Alba 1993; also see Alba and Logan 1991, 1993). The first model derives from the Chicago School's classical theory of spatial assimilation. Spatial assimilation theory aligns geographic mobility with social and economic mobility, positing that individuals leverage their socioeconomic resources to attain residence in the best possible neighborhoods. The key expectation of the spatial assimilation model is that minority group members are able to use their socioeconomic capital to attain housing in neighborhoods that are as desirable as the neighborhoods attained by the white majority (Massey 1985). Here it is worth noting that the spatial assimilation model has been applied to the examination of access to neighborhoods differentiated by not only income (cf., Alba, Logan, and Stults 2000a; Crowder and South 2005) but also racial composition (cf., Crowder et al. 2006; Logan et al. 1996; South, Crowder, and Pais 2008), with the implicit assumption that whiter neighborhoods are those to which householders seek to gain access. However, racial differences in neighborhood preferences (Clark 2009; Krysan and Bader 2007) call into doubt this implicit theoretical assumption and suggest that patterns of assimilation into neighborhoods with large concentrations of whites might differ substantially from processes of assimilation into higher-income areas.

Two other models of neighborhood locational attainment fall under place stratification theory. Place stratification theory describes how powerful groups manipulate space to maintain their physical and social separation from groups they view as undesirable (Charles 2003; Logan and Molotch 1987). This perspective draws attention to the barriers to residential mobility faced by minorities. For example, the discriminatory behavior of real estate agents (Yinger 1995), local governments (Shlay and Rossi 1981), and mortgage lenders (Squires and Kim 1995) are known to create racially segmented housing markets that obstruct the locational attainments of racial minorities, especially African Americans. Although housing discrimination against Latinos is nontrivial (Ross and Turner 2005), prior research in support of place stratification theory finds that blacks are less able than Latinos to attain spatial proximity to the white majority even after adjusting for group differences in the socioeconomic, demographic, and geographic determinants of neighborhood attainment (South et al. 2008). The place stratification framework raises serious questions about the extent to which racial minorities are able to convert their socioeconomic resources into better quality neighborhoods for themselves and their families.

There are two variants of place stratification theory, each reflecting the kinds of obstacles faced by minority groups in attaining access to quality neighborhoods. The *strong version of place stratification* implies that minorities are less able than whites to convert their socioeconomic resources into advantaged locational attainments, and that the "most successful members [of the minority group] may live in worse locations than even the lowest-status members of the majority" (Logan and Alba 1993:244). The *weak version of place stratification theory* posits that minorities are forced to pay more than whites to achieve advantageous neighborhood outcomes because minorities face a higher barrier to neighborhood entry. As a result, the effects of individual SES on neighborhood quality tend to be stronger for minority than majority group members, but here too even high-SES minorities are unable to attain a level of neighborhood quality enjoyed by majority group members with comparable SES.[1]

[1]See Logan and Alba (1993) for a graphical illustration depicting the differences between spatial assimilation, the weak version of place stratification, and the strong version of place stratification.

Prior studies of minority locational attainment, and particularly minorities' ability to convert SES into residence in advantageous neighborhoods, have generated mixed results. John Logan and Richard Alba (1993) generally find greater support for the strong version of place stratification theory in their study of racial and ethnic differences in access to suburban places characterized by their income levels. In contrast, support for the weak version of place stratification theory is observed in studies that characterize the neighborhood outcome by its racial composition. Both Alba and Logan (1993) and Patrick Bayer, Robert McMillan, and Kim Rueben (2004) find that, among blacks, income is strongly related to neighborhood racial composition, and Kyle Crowder, Scott South, and Erick Chavez (2006) observe stronger effects of SES among blacks than among whites on migration into whiter neighborhoods. Yet, at an aggregate level, Jeffrey Timberlake and John Iceland (2007) find that minority groups have been more successful at converting their relative socioeconomic resources into higher SES status neighborhoods than into spatial proximity to whites. We address this apparent discrepancy in past research by comparing models of locational attainment into neighborhoods characterized by both average family income and racial composition. Our purpose is to determine the generalizability of the spatial assimilation and place stratification perspectives by contrasting in a single study the two most commonly researched neighborhood outcomes (neighborhood racial composition and neighborhood income levels).

Perhaps of equal importance, previous research tacitly assumes that the effects of individual SES on neighborhood attainments are constant across metropolitan areas throughout the United States. Yet, this assumption is open to question. We know that levels of racial residential segregation vary considerably across metropolitan areas (Farley and Frey 1994; Logan et al. 2004), and that these metropolitan-level differences account for a considerable portion of the variation in racial neighborhood disparities at the individual level (South et al. 2008). Accordingly, support for spatial assimilation, the weak version of place stratification, or the strong version of place stratification theory may also vary from one metropolitan area to the next. In other words, the applicability of existing theoretical models of minority locational attainment may be contingent on the specific metropolitan area under consideration.

We address this issue by applying multilevel modeling techniques to obtain metropolitan-level Empirical Bayes estimates of the effects of individual SES on neighborhood outcomes. This methodological approach allows us to (1) determine if (and how much) the effect of SES on neighborhood outcomes varies across metropolitan areas for both whites and minorities; (2) determine how many metropolitan areas best fit each of the theoretical models of neighborhood attainment; and (3) assess which metropolitan-area characteristics explain why the effect of SES on neighborhood outcomes varies across metropolitan areas. The examination of outcomes related to both the racial composition and the socioeconomic characteristics of residential areas allows us to speak to multiple branches of research and to assess the extent to which the moderating effects of metropolitan structures operate similarly in processes of racial-residential assimilation and access to higher-income areas.

Metropolitan Area Influences on Minority Locational Attainment

Several metropolitan-area characteristics might shape the ability of minorities (and whites) to convert SES into migration to particular types of neighborhoods. Metropolitan-area factors may affect the level of disadvantage experienced by minorities in a particular area, and this could be a key mechanism through which metropolitan-area characteristics affect differential locational attainments for minorities. For example, high levels of *racial and ethnic residential segregation*—which tend to reflect local discriminatory housing market practices that restrict the movement of minorities into advantaged neighborhoods (Massey and Denton 1993)—may increase the level of SES minorities require to attain residence in

desirable neighborhoods (as implied by the weak version of place stratification theory) or possibly present local barriers that are more or less insurmountable for minorities (as implied by the strong version of place stratification theory). We know that minorities in highly segregated metropolitan areas tend to live in more disadvantaged and dangerous neighborhoods (e.g., Krivo, Peterson, and Kuhl 2009); one possible reason for this is that minorities in these highly segregated areas have more difficulty converting their SES into advantageous neighborhood locations.

The level of *suburbanization* in a metropolitan area is also likely associated with racial and ethnic differences in locational attainment (Logan et al. 2004). Higher levels of suburbanization are thought to reflect in part the desire of whites to preserve their social distance from minorities. Similarly, high levels of *political fragmentation* within metropolitan areas tend to encompass a multitude of suburban municipalities that have traditionally utilized their autonomy to erect land use regulations and zoning ordinances to exclude minority groups (Knox 2008). In contrast, low levels of fragmentation via annexation and/or countywide governance have historically made exclusionary land-use policies less common (Farley and Frey 1994; Frey and Farley 1996). Thus, we expect the level of suburbanization and the level of political fragmentation in metropolitan areas to moderate the effect of SES on neighborhood outcomes, and to do so differently for blacks and Hispanics than for whites.

Metropolitan-area *racial and ethnic composition* is another structural characteristic associated with racial and ethnic differences in neighborhood outcomes. Prior work suggests that whites may respond to large minority populations in a metropolitan area by more vigorously segregating themselves from these groups, perhaps using the discriminatory methods described by the place stratification model. This argument is consistent with group-threat arguments that posit that discrimination against minorities increases with the relative size of the minority group (Blalock 1967; Lieberson 1980). For this reason, we anticipate that the effect of metropolitan-area racial composition on individuals' ability to convert SES into neighborhood attainments will differ among blacks, Hispanics, and whites in ways that are consistent with either the strong or the weak version of place stratification theory.

For similar reasons, the relative *size of the foreign-born population* in the metropolitan area might also influence the ability of minorities to convert SES into desirable neighborhood attainments. Prior research suggests that a sizable presence of the foreign born fosters a mixing of ethnic and racial subgroups and perhaps greater neighborhood integration of social classes. Mary Fischer and Marta Tienda (2006) and Logan and Charles Zhang (2010) maintain that a large local presence of foreign-born population weakens class divisions by increasing residential exposure to racial and ethnic diversity. However, whether the white majority values increasing levels of neighborhood diversity, on average, is debatable (e.g., Wilson and Taub 2007). Indeed, increasing levels of immigration may trigger white flight (e.g., Crowder, Hall, and Tolnay 2011). Thus, if it is increasingly difficult for whites to maintain spatial separation from minorities in metropolitan areas with high concentrations of immigrants, then it could be even more difficult for minorities to convert their SES into positive neighborhood outcomes in these places.

Several other metropolitan-area characteristics might also influence racially and ethnically differentiated patterns of neighborhood attainment. Large metropolitan areas typically exhibit higher costs of living, and this may increase the relative costs of neighborhood attainment for individuals in general. The overall *poverty level* of the metropolitan area could shape race-specific processes of residential attainment. High levels of poverty are likely to produce an abundance of unattractive neighborhoods (e.g., poor housing stock, high crime, and low-quality schools) throughout the metropolitan area. Therefore, high poverty

levels could make it more difficult for people to convert their SES into quality neighborhoods. Minorities might find it particularly difficult to convert SES into desirable neighborhood location in metropolitan areas with high poverty rates because minorities in poor areas might find their minority status to be more of a disadvantage.

Finally, the availability of *new housing* within a metropolitan area is likely to play a role in shaping patterns of neighborhood attainment. Reynolds Farley and William Frey (1994) argue that new housing developments typically lack the exclusionary reputations of older, predominantly white areas and are subject to fair housing legislation that limits discriminatory housing practices. Moreover, not only will the availability of new housing open up opportunities for residential attainment in general, but an ample supply of new housing is likely to have a particularly strong impact on residential opportunities for higher SES minorities. Therefore, in metropolitan areas with much newly built housing, minorities may be able to convert their SES into neighborhood attainments at a rate equal to that of whites, a proposition consistent with the spatial assimilation model of locational attainment.

Data and Methods

The primary data source for this study is the Panel Study of Income Dynamics (PSID). The PSID is a longitudinal study of approximately 5,000 families that began in 1968. Members of the initial PSID panel were interviewed annually until 1995 and biennially thereafter. New families have been added to the PSID as children of original panel members form their own households. By 2005, a cumulative total of over 9,000 families had been included in the sampling frame, providing information on more than 67,000 individuals.

A valuable feature of the PSID is the supplemental geocode file, which contains information on each household's census tract and metropolitan area of residence at each survey wave. This feature of the PSID allows us to determine which respondents move from one census tract to another and to model individual- and metropolitan-level influences on the racial composition and socioeconomic status of their destination neighborhoods. For this study, we focus on neighborhood attainments resulting from a residential move because simple cross-sectional comparisons of the effect of income on locational attainment are likely to be affected by the reciprocal relationship between individual SES and neighborhood quality (e.g., Cutler and Glaeser 1997). By observing the neighborhood outcome resulting from a residential move, concern over whether individual SES is a consequence or a cause of neighborhood quality is minimized. Tract-level census data are drawn from the Neighborhood Change Data Base (NCDB), in which data from earlier censuses have been normalized to 2000 tract boundaries, allowing us to produce consistent measures of census tract racial composition and average family income over the study period (GeoLytics 2008). To estimate the values of tract characteristics for noncensus years between 1990 and 2005, we use linear interpolation and extrapolation.

For this study, we select all black, Hispanic, and white PSID household heads in survey years 1990 through 2005. The sample sizes for other racial and ethnic groups are too small, and their distribution across metropolitan areas too sparse, to be included in the analyses. We focus on household heads rather than all PSID family members to avoid counting the same family residential move more than once. Our study begins with the 1990 wave because prior to 1990 the PSID had no mechanism for incorporating immigrants into the sampling frame. This limitation severely underrepresented Hispanic residents because individuals arriving in the United States after 1968 were unaccounted for in the PSID. To remedy this situation, the PSID in 1990 added a sample of Latino families that were originally drawn as part of the Latino National Political Survey (LNPS) (de la Garza et al. 1998). The PSID took further steps in 1997 and 1999 by officially adding an immigrant refresher sample. These

steps ensure that after 1990 we observe sufficient numbers of Hispanic residential moves to sustain analyses. The application of these selection criteria results in a sample of 5,195 inter-tract residential moves for black household heads, 783 inter-tract residential moves for Hispanic household heads, and 5,480 inter-tract residential moves for white household heads. These residential moves occur within 291 census-defined metropolitan areas that contain white and black PSID respondents and within 278 metropolitan areas that contain white and Hispanic respondents.

Variables

Dependent Variables—Our dependent variables tap two critical dimensions of mobile households' destination neighborhood: the percentage of the census tract population that is non-Hispanic white and average family income.

Independent Variables—The independent variables for this study consist of individual- and metropolitan-level characteristics. We control for a series of individual-level characteristics associated with residential mobility outcomes to adjust for differences in population composition across metropolitan areas that could confound associations between metropolitan-level characteristics and neighborhood outcomes. We then introduce a number of metropolitan-level explanatory variables to determine whether broader social, economic, and ecological factors affect people's ability to convert SES into neighborhood attainments. All individual-level variables are measured prior to the residential move. To capture linear changes in inter-neighborhood migration over the study period, we include survey year as a continuous variable (a counter variable starting at time point 0 in 1990). To address the well-known issue of selection associated with the migration process, we include a Heckman correction (i.e., an inverse Mills ratio) based on a probit model predicting the probability of making a residential move based on all the individual-level covariates.

Our primary measure of individual socioeconomic status is the total taxable income for householders and (if present) spouses, in constant 2000 dollars.[2] Individual-level control variables include the respondent's age, gender, marital status, number of children, homeownership status, and household crowding. Respondent's age is measured continuously in years. Gender is a dummy variable scored 1 for female household heads and 0 for male household heads. Married respondents (and long-term cohabitors) are distinguished from unmarried respondents by a dummy variable. The number of children under age 18 in the household is measured as a continuous variable. Homeowners are distinguished from renters with a dummy variable taking a value of 1 for those living in an owner-occupied dwelling. Household crowding is measured by the number of persons per room in the dwelling. To facilitate the interpretation of the effects, all continuous independent variables (except family income) are grand mean centered. Because the spatial assimilation model implies that high-SES minorities should attain comparable neighborhood outcomes as high-SES whites, we center income so that the comparisons between minorities and whites (i.e., the comparison of the intercepts) will be in reference to those with family incomes of $125,000, which is roughly twice the average family income in 2000.

At the metropolitan level, we consider the effects of population size (measured in log form), the percentage of the population that is foreign born, the percentage living in households with an income below the poverty level, and the proportion of new housing units built in the prior ten years. In the white-black comparison models we include the percentage of the metropolitan-area population that is non-Hispanic black, and in the white-Hispanic

[2]A parallel analysis focusing on the effects of education—measured by completed years of schooling—produced very similar results and our conclusions are virtually unchanged. To minimize redundancy, we focus only on the effects of income.

comparison models we include the percentage of the metropolitan-area population that is Hispanic. All of these variables are computed from the 1990 and 2000 U.S. Census of Population and Housing Summary Files (U.S. Bureau of the Census 1992, 2004). Additionally, we use the dissimilarity index to capture the extent of white-black and white-Hispanic residential segregation. These measures are computed from tract-level racial and ethnic distributions (Lewis Mumford Center 2001). The level of suburbanization is measured by the percentage of the metropolitan area population residing in the suburban ring of the metropolitan area (U.S. Department of Housing and Urban Development 2009).

Our measure of political fragmentation, adapted from Kendra Bischoff (2008), uses data on the number and size of municipal governments in each metropolitan area as given in the U.S. Census of Governments (U.S. Bureau of the Census 2008). This measure captures the probability that two randomly selected individuals from the same metropolitan area live in different municipalities. There is complete fragmentation (high value) if all metropolitan area residents live in different municipal districts and there is complete incorporation (low value) if all individuals live in a single metropolitan-wide municipality. As with the measures of the neighborhood outcomes, we use linear interpolation and extrapolation to estimate metropolitan-level values of these characteristics for the non-census years between 1990 and 2005. To facilitate interpretation of their effects, all metropolitan characteristics are grand mean centered.

Analytic Approach

In order to highlight variations in the effects of individual characteristics within and across metropolitan areas, we estimate a series of multilevel models (Raudenbush and Byrk 2002) to compare the patterns of locational attainment for blacks and Hispanics with the pattern for whites. Model {1.0} represents the fully specified null model used in this research (in composite form):

$$\begin{aligned} Y_{ij} = & \underbrace{\beta_0 + \beta_1 \text{black}_{ij} + \beta_2 \text{income}_{ij} + \beta_3 \text{income}_{ij} * \text{black}_{ij}}_{\text{fixed effects}} \\ & + \underbrace{\beta_4 \lambda_{ij} + \beta_5 \text{year}_{ij} + \beta_4 \lambda_{ij} * \text{black}_{ij} + \beta_5 \text{year}_{ij} * \text{black}_{ij}}_{\text{fixed effects}} \\ & + \underbrace{v_{0j} + v_{1j} \text{black}_{ij} + v_{2j} \text{income}_{ij} + v_{3j} \text{income}_{ij} * \text{black}_{ij} + \varepsilon_{ij}}_{\text{random effects}} \end{aligned} \quad (1.0)$$

where Y_{ij} is the neighborhood outcome (i.e., percent non-Hispanic white or average neighborhood income) resulting from a residential move at measurement occasion i in metropolitan area j; β_0 is the population average neighborhood outcome for whites (i.e., fixed intercept); β_1 is the population average white-black difference in neighborhood outcome; β_2 is the population average effect of income on neighborhood outcome for whites; and β_3 is the population average white-black difference in the effect of income on neighborhood outcome Y_{ij}[3].

This formulation is considered the fully specified null model for this research because it includes five random effects (ε_{ij}; v_{0j}; v_{1j}; v_{2j}; v_{3j}): ε_{ij} is the level-one idiosyncratic error; v_{0j} is a random intercept capturing the metropolitan-level heterogeneity in the average neighborhood outcome for whites; v_{1j} is a random slope capturing the metropolitan-level heterogeneity in the average white-black difference in neighborhood outcome; v_{2j} is a random slope capturing the metropolitan-level heterogeneity in the effect of income on

[3]To save space, we present only the fully specified null model used to assess the white-black difference in locational attainment; the white-Hispanic models take the same general form.

neighborhood attainment for whites; and v_{3j} is a random slope capturing the metropolitan-level heterogeneity in the white-black difference in the effect of income on neighborhood outcome Y_{ij}. Because these random effects may (or may not) vary significantly across metropolitan areas, we estimate a series of null models that are conditional only on the inverse Mills ratio λ_{ij} and the linear term for $year_{ij}$. We estimate a series of null models with these fixed effects held constant while stepping in the random effects to determine whether their inclusion improves model fit. The results of this procedure are presented in Table 2, which is discussed in detail in the results section.

Once the optimal structure of the random effects is determined, we are then able to assess the extent of metropolitan heterogeneity in the locational attainment process, and importantly, we are able to assess which locational attainment model predominates for blacks and Hispanics. In the final step of the analyses, we include individual- and metropolitan-level covariates and cross-level interactions to explain why the effect of income on neighborhood outcomes varies across metropolitan areas.

Results

Table 1 provides the descriptive statistics for the PSID sample of white, black, and Hispanic residential movers. Readily apparent in Table 1 are stark racial and ethnic disparities in destination neighborhood racial composition and neighborhood income. White movers relocate to census tracts that are on average 81 percent non-Hispanic white and contain households that average roughly $62,000 annually. In sharp contrast, black movers relocate to tracts that are on average 33 percent non-Hispanic white and contain households that earn $42,000, and Hispanics attain neighborhoods that are on average 50 percent non-Hispanic white and contain households that average $51,000.

In addition to these pronounced racial and ethnic neighborhood disparities, there are several noteworthy individual- and metropolitan-level differences between the white, black, and Hispanic PSID households. On average, white households earned nearly $60,000 (in 2000 dollars), whereas black families earned only $30,000 and Hispanics earned $42,000. There are more women householders and fewer married couples among the black sample compared to whites and Hispanics. Blacks and Hispanics are likely to have more children and tend to live in more crowded dwellings than whites. Blacks and Hispanics are also less likely to be homeowners than whites. Noteworthy metropolitan-level differences between whites, blacks, and Hispanics include the levels of residential segregation and racial and ethnic composition. Compared to whites, blacks tend to live in metropolitan areas with higher levels of white-black residential segregation and larger black populations. Hispanics live in metropolitan areas that have higher levels of white-Hispanic segregation and larger Hispanic and foreign-born populations than the metropolitan areas that whites live in.

Although the unconditional neighborhood racial and ethnic disparities are pronounced—which to some degree reflects the pronounced racial and ethnic differences in family income—the main objective of this research is not simply to determine if these racial and ethnic disparities persist after controlling for an extensive list of important individual- and metropolitan-level characteristics. Rather, our primary aim is to assess whether individuals' ability to convert income into neighborhood attainments varies across metropolitan areas in ways consistent with the three locational attainment theories.

Assessing Model Specification and Fit

Table 2 provides the model fit statistics and the variance components for all the models in the analysis. The variance components are estimated via restricted maximum likelihood, whereas the model fit statistics are evaluated via maximum likelihood estimation. The

variance components presented in Table 2 correspond to the random effects parameters in Model {1.0}. The following notation facilitates the interpretation the results in Table 2: σ^2 refers to the level-one variance; τ^2_0 is the variance component for the random intercept for whites; τ^2_1 is the variance component for the minority-white difference in the intercept; τ^2_2 is the variance component for the random effect of income on neighborhood outcomes for whites; τ^2_3 is the variance component for the minority-white difference in the random effect of income on neighborhood outcomes.

The first step in the analysis is to determine the model specification of the random effects. This step provides us with essential information concerning whether or not the effect of movers' individual income on neighborhood attainments varies across metropolitan areas. There are three null models for each neighborhood outcome and for each racial and ethnic comparison. The first null model specifies a random intercept and a random slope for the minority-white difference in neighborhood outcome. This is the baseline null model. The baseline null model captures the extent to which the neighborhood outcomes vary across metropolitan areas for whites and minorities. The second null model adds a random slope for the minority-white difference in the effect of income on neighborhood attainments. The addition of this random effect is key to the main research question. The third null model adds a random slope to capture metropolitan-level heterogeneity in the effect of income on neighborhood attainments for whites. This third null model incorporates all of the random effects as formalized above in Model specification {1.0}.

To assess model fit, Table 2 provides two statistics: the Akaike information criterion (AIC) and the likelihood ratio test (χ^2). The lower the AIC scores, the better the fit of the model. A difference greater than ten on the AIC scale is considered a large improvement in model fit (Burnham and Anderson 2002). We also conduct a likelihood ratio test because the models are nested. The likelihood ratio test provides us with a formal significance test as to whether the addition of each new random effect is warranted over the previous model. When there is strong evidence of improved model fit, these fit statistics will concur. When there is questionable improvement (or no improvement), the fit statistics may not agree, with the AIC criteria being more conservative.

Looking at the results in Table 2 for the second null model (second row of each panel), we find that the inclusion of the random slope for the white-black and white-Hispanic difference in the effect of income on neighborhood percent non-Hispanic white significantly improves model fit over the baseline null model (first row of each panel). The improvement of AIC in both cases is greater than 10 (96763 – 96747 = 16 and 53818 – 53783 = 35) and the likelihood ratio test is statistically significant at the .001 level in both cases ($\chi^2 = 21.9$; $df = 3$ and $\chi^2 = 41.0$; $df = 3$). Thus, we conclude that there is indeed meaningful metropolitan heterogeneity in the racial and ethnic difference in the effect of income on neighborhood percent non-Hispanic white.

The same general conclusion holds for the second measure of destination neighborhood quality—average household income. The results shown in Table 2 reveal significant metropolitan-level variation in the minority-white difference in the effect of family income on the destination neighborhood's income level. Thus, the minority-white difference in the effect of family income varies significantly across metropolitan areas for both neighborhood outcomes. However, there is one notable difference in model fit between the two neighborhood outcomes. Whereas the third null model fails to provide an improved model fit over the second null model when the outcome is percent non-Hispanic white, there is an improvement in fit for the third null model over the second null model when the outcome is neighborhood income. The third null model adds a random slope ($v_{2j}\,\text{income}_{ij}$) for income, so this finding means that among whites the effect of family income varies more across

metropolitan areas when the outcome is neighborhood income than it does when the outcome is tract percent non-Hispanic white. In fact, the variance component for the effect of income on neighborhood percent non-Hispanic white among whites is nearly zero (rounded up to the third decimal place).

This finding has two implications, one methodological and one substantive. First, because we assess the level of metropolitan-area heterogeneity in the locational attainment process with the null model that provides the best fit, we use Model 2 when the outcome is the percent non-Hispanic white and Model 3 when the outcome is average neighborhood income. We also maintain this distinction in the model specification when introducing covariates and cross-level interactions. Second, and substantively, this finding suggests that there are fewer metropolitan-level impediments in the locational attainment process for whites seeking residence in "whiter" neighborhoods than there are when whites seek neighborhoods that have higher income levels. Essentially, the effect of individual socioeconomic status on neighborhood racial composition among whites is constant across metropolitan areas.

Table 3 presents the fixed effects from the best fitting null models. The column reporting the main effects for whites will be similar (but not identical) across the two sets of minority comparison models (i.e., white-black and white-Hispanic comparison models). The subtle differences reflect slightly different sample distributions (e.g., 278 versus 291 metropolitan areas), and in the full models in Table 4, subtle differences are also attributed to the inclusion of several different metropolitan-level covariates (e.g., percent Hispanic in place of percent black in the white-Hispanic comparison models).

White-Black Comparisons

According to the results in Table 3, the population average point estimates (i.e., fixed effects) indicate that high-SES blacks do not attain neighborhoods that are even remotely similar in racial composition to high-SES whites. For example, the intercepts in Model 1a of Table 3 indicate that white households earning roughly $125,000 move to neighborhoods that are on average approximately 85 percent non-Hispanic white, which is 23 percentage points more white than residentially mobile black households with the same annual income. A similar racial disparity in neighborhood attainment is also observed when the outcome is neighborhood income level. According to the Model 2a, white households earning approximately $125,000 move to neighborhoods with average income level of about $55,000, which is $10,500 more than the neighborhoods that black households earning $125,000 are able to move to. These fixed effects do not support the spatial assimilation model: high-income black households do not attain residence in neighborhoods of similar quality as high-income white households.

An important premise of the three locational attainment models discussed above is that the effect of SES on neighborhood attainments will be different for minorities when compared to the white majority. The models presented in Table 3 provide mixed support for this premise at the population level (i.e., according to the fixed effects, which are averaged across all metropolitan areas). Among whites, the effect of income on neighborhood percent non-Hispanic white is positive and statistically significant ($\beta = .016$, $p < .01$) but small in magnitude. For example, a $10,000 increase in household income is only associated with a .16 percentage point increase in the percentage of the neighborhood population that is non-Hispanic white. Among blacks, however, the same $10,000 increase in household income is associated with a 1.32 percentage point increase in white neighbors ([.016 + .116 = .132] * 10 = 1.32). The effect of income among black movers at the population level is significantly more positive than the corresponding effect among whites, and this finding, coupled with the racial difference in the intercepts, favors the weak version of place stratification theory. The

positive effect of individual SES on neighborhood percent white is stronger among blacks than whites, but even high-income blacks reside in substantially less white neighborhoods than high-income whites.

A somewhat different pattern emerges when the outcome is average neighborhood income (Model 2a). Compared to the results for neighborhood percent non-Hispanic white, the effect of family income on neighborhood income among whites is much stronger (β = .127 versus β = .016), and we find essentially no racial difference in the effect of income (β = −.004, p = ns). Whites have little difficulty moving into largely white neighborhoods regardless of whites' income level (and regardless of which metropolitan area those neighborhoods are embedded). But for a move into a neighborhood characterized only by its average income levels, the effect of SES is the same for both whites and blacks. One reason for this discrepancy across neighborhood outcomes is that there may be different class-based reactions among whites to black neighbors. Residents of predominantly wealthy white neighborhoods may view black neighbors as less of a threat because the high cost of housing deters poor households of every race and ethnicity from moving in. On the other hand, predominantly white working-class neighborhoods may be more hostile to black neighbors because their relative neighborhood advantages are less secure (e.g., Lukas 1985).

Of course, these fixed effects reported in the null model say nothing about the range and extent of metropolitan heterogeneity in the locational attainment process. Although these null models lend support at the population level to the weak version of place stratification theory, variation across metropolitan areas could challenge or qualify this conclusion. And indeed, according to the results in Table 2, there is substantial metropolitan-level variation in the locational attainment process. According to the variance component τ^2_1, reported for the null Model 1a ($\sqrt{255.143}$=16.05), the white-black difference in neighborhood percent white across metropolitan areas *ranges within approximately* two standard deviations from a high of 8.2 to a low of −54.6 percentage points (−23.3 +/− [1.96*16.05] = 8.2, −54.6). Although the average white-black difference within metropolitan areas is −23.3 percentage points, there is clearly a large range in the average racial difference across these metropolitan areas. Among the list of metropolitan areas with extreme racial disparities are Detroit, St. Louis, and Chicago, each exhibiting racial differences in neighborhood percent white among high-SES households in excess of 45 percentage points. According to the variance component τ^2_3 for the null Model 1a ($\sqrt{.011}$=.105), the white-black difference in the effect of income on neighborhood racial composition *ranges within approximately* two standard deviations from a high of .322 to a low of −.090 percentage points (.116 +/− [1.96*.105] = .322, −.090). This represents considerable metropolitan variation because (1) the improvement to model fit is large when we allow the effect to vary across metropolitan areas; (2) the two standard deviation range crosses the zero threshold, which means in some metro areas the effect is positive and in others it is negative; and (3) using the metric of the effect, there are metropolitan areas (e.g., Dallas) where the effect is nearly three times as large as the population average (.116 versus .322). This metropolitan-level heterogeneity suggests that processes of locational attainment are highly place specific.

To further assess the extent of metropolitan heterogeneity in the locational attainment process, we calculate from the multilevel equations the best linear unbiased predictors (BLUP) for each metropolitan area in the analysis (Robinson 1991). An important feature of the BLUPs is that they allow us to independently assess the locational attainment process for each metropolitan area. That is, we can assess the pattern of effects for each metropolitan area, and then categorize each area as either supporting the spatial assimilation model, the weak version of place stratification theory, or the strong version of place stratification theory. Our decision rules for categorizing each metropolitan area are as follows: To conform to the spatial assimilation model, the intercept (i.e., average neighborhood

outcome) among high-SES minorities (i.e., earning $125,000) must be equal to or greater than the intercept for high-SES whites. To conform to the weak version of place stratification, the slope of individual income for minorities must be greater than or equal to the slope for whites and the intercept for high-SES minorities must be less than the intercept for high-SES whites. And to conform to the strong model of place stratification, the income slope for minorities must be less than the slope for whites and the intercept for high-SES minorities will also be less than that for high-SES whites.[4]

In the analysis of racial differences in neighborhood percent non-Hispanic white, only two metropolitan areas support the spatial assimilation model (Casper, WY and Honolulu, HI) and only one metropolitan area (Nashville, TN) supports the strong version of place stratification theory. The pattern of effects in the remaining 288 metropolitan statistical areas (MSAs) all support the weak version of place stratification theory—with black intercepts less than, but black slopes larger than, the corresponding values for whites. Thus, despite the vast range of metropolitan differences in both the intercepts and slopes, the joint pattern of effects across metropolitan areas is remarkably homogenous. This lends strong nationwide support for the weak version of place stratification theory.

As with neighborhood racial composition, there is considerable metropolitan-level variation in the white-black difference in neighborhood income and considerable metropolitan-level variation in the white-black difference in the effect of family income on neighborhood income. However, unlike neighborhood racial composition, the joint pattern of the intercepts and slopes provides some support for all three locational attainment models. In fact, the pattern of effects in 54 percent of the metropolitan areas conforms to the strong version of place stratification (157/291 = 54 percent), 40 percent of the metropolitan areas conform to the weak version, and 6 percent conform to the spatial assimilation model. Therefore, the conclusion drawn from the fixed effects in Model 2a—that the results for neighborhood income also support the weak version of the stratification model—requires qualification. There is more support for the strong version of place stratification when we account for metropolitan heterogeneity in the locational attainment process. It appears, then, that metropolitan areas have more of an effect on determining whether blacks are able to convert their income into neighborhoods characterized by their socioeconomic status than by their racial composition.

White-Hispanic Comparisons

The pattern of effects in the white-Hispanic comparisons models is generally similar to the pattern of effects in the white-black comparison models, albeit with several notable exceptions (Table 3). Foremost, the population average white-Hispanic differences in neighborhood non-Hispanic white (−.973) and neighborhood income (−3.357) among high-SES households are much smaller than the corresponding white-black differences (−23.287 and −10.500). In fact, among households with incomes around $125,000 there is virtually no difference in neighborhood racial composition between Hispanics and whites. The white-Hispanic difference in the effect of family income on neighborhood outcomes at the population level is similar to that of the white-black comparison models. In general, the pattern of fixed effects for Hispanics in Model 1b (for tract percent non-Hispanic white) and in Model 2b (for tract average household income) could be interpreted as conforming to either the weak version of place stratification theory or to spatial assimilation theory; for both outcomes the white-Hispanic difference in the intercepts is negative, but small and statistically nonsignificant (−.973; −3.357).

[4]Using significance tests for each BLUP to determine classification did not seem appropriate because the data are unbalanced and we did not want our results to be affected by the fact that different metropolitan statistical areas (MSAs) have different degrees of statistical power. Thus, we simply use the empirical Bayes estimates to classify each MSA.

With this uncertainty at the population level it is important to consider the extent of metropolitan heterogeneity in the locational attainment process for Hispanics. The variance components reported in Table 2 address this issue. There are modest differences in the variance components between blacks and Hispanics that suggest that the process of residential attainment varies slightly more across metropolitan areas for Hispanics than for blacks. Although neighborhood racial composition varies more across metropolitan areas for high-SES blacks (257.474) compared to high-SES Hispanics (175.132), neighborhood income varies over twice as much for Hispanics (541.530) compared to blacks (213.129), and the effect of income on both of these neighborhood outcomes also varies more across metropolitan areas for Hispanics than blacks. But while the variance components are instructive, we can better assess whether this variation has a significant impact on the locational attainment process for Hispanics by evaluating the predicted values for each metropolitan area.

According to the classification of metropolitan areas using the Empirical Bayes estimates, 17 percent of the metropolitan areas support the spatial assimilation model for Hispanics when the neighborhood outcome is based on racial composition (e.g., Atlanta and San Diego), and slightly more metropolitan areas (21 percent) support the spatial assimilation model when the outcome is neighborhood income (e.g., New York and Miami). The large majority of metropolitan areas (81 percent) support the weak version of place stratification when the outcome is neighborhood percent non-Hispanic white, and a slight majority of metropolitan areas (57 percent) support the strong version of place stratification when the outcome is neighborhood income (e.g., Chicago and San Antonio).

An important implication of these findings is the overall robustness of the place stratification perspective—across two different neighborhood outcomes and two different minority groups—once we account for the extensive level of metropolitan heterogeneity. These findings also indicate that it is important to consider both the racial and economic characteristics of neighborhoods when studying neighborhood attainments, as there is greater variation in the locational attainment process with regard to neighborhood income than with neighborhood racial composition.[5]

The Effects of Metropolitan-Area Characteristics on Locational Attainment

Having established the range and extent of metropolitan-area variation in the locational attainment process for whites, blacks, and Hispanics, our next objective is to determine whether theoretically relevant metropolitan-area characteristics can explain this variation. Table 4 presents the findings from a set of full models that include cross-level interactions between the random slope for family income and our key metropolitan-level predictors. There are several significant individual-level effects worth noting. Net of the effects of the other covariates, white women household heads are significantly more likely than white male heads to move to wealthier neighborhoods ($\beta = 1.536$). The gender difference is reversed among Hispanics (relative to the gender difference among whites, $\beta = -5.769$).

[5]To determine whether our findings might be affected by the unbalanced nature of the data, we reanalyzed the models by including only metropolitan areas with a minimum of ten minority observations. For the white-black neighborhood percent white model, we find that 100 percent of the MSAs conform to the weak version of place stratification. For the white-black neighborhood SES model, we find that 2 percent of the MSAs conform to the spatial assimilation model, 31 percent conform to the weak version of place stratification, and 68 percent conform to the strong version of place stratification. For the white-Hispanic neighborhood percent white model, we find that 15 percent of MSAs conform to the spatial assimilation model, 81 percent conform to the weak version of place stratification, and 4 percent conform to the strong version of place stratification. For the white-Hispanic neighborhood SES model, we find that 37 percent of the MSAs conform to the spatial assimilation model, 22 percent conform to the weak version of place stratification, and 41 percent conform to the strong version of place stratification. These supplemental analyses do not alter our main conclusion: There is greater metropolitan heterogeneity in terms of locational attainment when neighborhood SES is the outcome than when racial composition is the neighborhood outcome, and place stratification is still the modal pattern for both neighborhood outcomes and both minority groups.

Relative to same-race renters, black homeowners move to neighborhoods that are significantly less white than the neighborhoods white homeowners move to ($\beta = -10.252$). The number of children in the household tends to be associated more strongly with poorer neighborhood conditions for minorities than for whites. Household crowding, on the other hand, is more strongly associated with poor neighborhood conditions among whites than minorities, especially with regard to neighborhood income, suggesting that minority households often need to make trade-offs (less house for a better location) to attain housing in advantageous neighborhoods (e.g., Briggs et al. 2010:139).

Although these individual-level effects are informative, the key focus of this study is on the metropolitan-level effects. Because of the centering to family income, the main effects for the metropolitan-area covariates (and the minority-white difference in the main effects) are in reference to families that earn $125,000. The results in Table 4 point to several significant metropolitan-level effects on neighborhood outcomes. For instance, the level of white-black residential segregation is associated with moving to whiter and moving to wealthier neighborhoods (Models 1a and 2a) and higher levels of white-Hispanic residential segregation are associated with moving to wealthier neighborhoods (Model 2b). However, these fixed effects do not differ significantly between high-SES minorities and high-SES whites. The percentage of the metropolitan-area population living in suburban areas is negatively associated with the movement of high-SES blacks, relative to high-SES whites, into whiter neighborhoods (Model 1a), thereby contributing to higher levels of white-black residential segregation.

Additionally, municipal fragmentation is positively associated with the movement of high-SES whites into whiter neighborhoods but the effect is negative among blacks (12.985 + −21.561= −8.576), thus also increasing racial segregation. Metropolitan-area percent black and percent Hispanic are negatively associated with the movement of high-SES whites into whiter neighborhoods, but the negative effect of percent black is significantly stronger among high-SES blacks ($\beta = -.534$). This finding suggests that whites are especially averse to having black neighbors in metropolitan areas with large black populations, even though demographic constraints overwhelm these preferences. Percent foreign born is negatively associated with the movement of high-SES whites into whiter neighborhoods but is positively associated with the movement of high-SES whites into wealthier neighborhoods; the effect of percent foreign born is significantly less positive for high-SES blacks ($\beta = -.438$). Metropolitan-area population size is associated with the movement of high-SES whites into less white but also into wealthier neighborhoods, whereas for high-SES blacks and Hispanics moves to whiter neighborhoods and wealthier neighborhoods are less common in larger metropolitan areas. Thus, large metropolitan areas evince higher levels of racial residential segregation and racial neighborhood inequality than smaller metropolitan areas partly because they channel minority movers into largely minority and poorer neighborhoods.

Poverty at the metropolitan level is associated with a greater likelihood of moving to a whiter neighborhood for high-SES whites and blacks (and more so for blacks than whites), but has a negative effect among Hispanics. For all three groups, high levels of metropolitan-area poverty are inversely associated with the average income of destination neighborhoods. Lastly, the supply of new housing in the MSA positively affects the movement of high-SES blacks into whiter neighborhoods, thus illustrating how racially differentiated inter-neighborhood migration contributes to the metropolitan-level association between the age of housing stock and racial residential segregation (Logan et al. 2004).

Table 2 provides the model fit statistics and the variance components for the main-effects-only model (model specification 4: “covariates”). These main-effects-only models (not

shown) omit the cross-level interactions, and are therefore better suited to assess how the inclusion of the covariates improves model fit over the baseline. In all comparison models, the improvement in fit is considerable over the null models (e.g., all AIC values improve by much more than 10 points), and as a block of covariates, these main effects account for a respectable share of the metropolitan-level variation in neighborhood outcomes. For example, 46 percent of the white-black (257.474 – 139.067/257.474 = 46 percent) and 24 percent of the white-Hispanic (175.132 – 132.566/175.132 = 24 percent) variation in tract percent non-Hispanic white is accounted for by the covariates. For neighborhood income, 43 percent of the white-black (213.129 – 121.757/213.129 = 43 percent) but only 2 percent of the white-Hispanic (541.530 – 532.462/532.462 = 2 percent) variation is accounted for by the covariates. These statistically significant metropolitan-level effects largely support the implicit assumption of aggregate residential segregation studies that metropolitan-area characteristics matter for neighborhood attainment (e.g., Logan et al. 2004). Of central interest for this research, however, is whether these same metropolitan-area characteristics affect the ability of minorities to convert their SES into desirable neighborhood attainments. Several statistically significant cross-level interactions in Table 4 speak directly to this question.

First, metropolitan areas with higher levels of white-black residential segregation and higher levels of poverty evince stronger effects of family income on neighborhood racial composition among blacks than whites ($\beta = .005$, $p < .05$; $\beta = .010$, $p < .05$, respectively). That is, high levels of segregation and poverty are associated with greater neighborhood differentiation between low- and high-income blacks, at least in terms of neighborhood racial composition. However, metropolitan-area levels of segregation and poverty have no effect on the ability of whites to convert their income into residence in whiter neighborhoods. That the effect of income on residential attainment is more pronounced among blacks than among whites in highly segregated and poorer metropolitan areas is consistent with the weak version of place stratification.

Second, among whites, higher levels of suburbanization ($\beta = .001$, $p < .05$) and larger foreign-born populations ($\beta = .002$, $p < .05$) increase the effect of family income on the destination-neighborhood income level. But seemingly counter to the place stratification perspective, these cross-level interactions are not significantly different for blacks or Hispanics. On the other hand, high levels of municipal fragmentation and metropolitan-level poverty attenuate the effect of family income on neighborhood income, suggesting that municipalities in highly fragmented areas with sizable poor populations compete for revenue-generating high-SES households, thus reducing the effect of family income on the likelihood of moving to advantaged neighborhoods for all high-SES households in those metropolitan areas.

Third, in the white-Hispanic comparison models, the percentage of the metropolitan-area population that is Hispanic increases the effect of income on moving into a whiter neighborhoods ($\beta = .002$, $p < .001$), but large foreign-born populations decrease the effect of income ($\beta = -.002$, $p < .01$). Hence, once we control for the relative size of the Hispanic population, higher percentages of foreign-born population make it easier for households to gain access to whiter neighborhoods. Perhaps the greater prevalence of immigrant enclaves in highly concentrated immigrant areas lowers the demand for whiter neighborhoods among immigrants and some minority groups (cf., Marcuse 1997), thus reducing the desire for, and the relative costs of, whiter neighborhoods in those areas.

Fourth, there are two cross-level interactions that are unique to Hispanics. The larger the relative size of Hispanic population, the greater the effect of family income on neighborhood income ($\beta = .005$, $p < .05$), a finding consistent with the weak version of place stratification.

The cross-level interaction between Hispanic family income and metropolitan-level poverty, on the other hand, is more consistent with the strong version of place stratification. For Hispanics living in the poorest metropolitan areas (e.g., two standard deviations above the mean for Hispanics, greater than 14 percent grand mean centered, which is greater than 22 percent poor), the effect of family income on neighborhood racial composition for Hispanics is negative [(.009 + .145) + (.001 + −.017)*14 = −.070]. This effect indicates that in areas of extreme poverty Hispanics are less able to use their SES to gain access to whiter neighborhoods, and thus even high-SES Hispanics in these high-poverty areas are unlikely to move to advantaged neighborhoods.

Finally, it is important to note that although there are several statistically significant cross-level interactions, the model fit statistics in Table 2 largely suggest that the added model complexity is unnecessary. The only model that has a lower AIC value is the white-Hispanic comparison model for neighborhood percent non-Hispanic white. The variance components in most cases are relatively unchanged between model specification 4 (“covariates”) and model specification 5 (“full with cross-level interactions”). So although the metropolitan-area characteristics do account for a sizable share of the variation in neighborhood outcomes across metropolitan areas, these characteristics do not do a particularly good job of explaining inter-metropolitan variation in the minority-white difference in the effect of income on neighborhood outcomes.

Discussion and Conclusion

Pronounced levels of neighborhood inequality between whites and minorities are perceived by many to be a serious social problem. However, areas of the country vary substantially in the ecological structures that shape residential opportunities among individual households, especially minority households (e.g., Farley and Frey 1994; Logan et al. 2004; South et al. 2008), and these structural differences may have profound effects on the level of neighborhood disadvantage experienced by minority households regardless of their social, economic, and cultural resources. In this article, we assess the extent to which the process of locational attainment based on two types of neighborhood outcomes—neighborhood racial composition and neighborhood socioeconomic status—varies across metropolitan areas for white, black, and Hispanic households. We also explore the metropolitan-area characteristics that explain variation in the effect of family income on neighborhood outcomes, and importantly, whether these metropolitan-level effects operate differently for minorities relative to whites.

We find that not only do the white-black and white-Hispanic differences in neighborhood outcomes (percent non-Hispanic white and average neighborhood income) vary significantly across metropolitan areas but that minority-white differences in the effect of family income on neighborhood outcomes also varies significantly across metropolitan areas. How these effects vary across metropolitan areas has several implications for our understanding of racial and ethnic spatial inequality and for extant theories of locational attainment.

Despite a high degree of metropolitan heterogeneity throughout the United States in terms of neighborhood quality, the joint pattern of effects across metropolitan areas is remarkably similar when the outcome is neighborhood percent non-Hispanic white. In fact, the BLUPs for nearly all metropolitan areas in the white-black comparison models, and in 81 percent of the metropolitan areas in the white-Hispanic comparison models, support the weak version of place stratification. Among residentially mobile households, the effect of family income on the racial composition of the destination neighborhood is stronger among black and Hispanic households than among white households, but even the highest-earning minority group members move to neighborhoods that are “less white” than the neighborhoods that the

highest-earning whites are able to attain. Conversely, the results for white household heads suggest that the socioeconomic barriers to whites moving into predominantly white neighborhoods are minimal regardless of the metropolitan area in which they live. This propensity for whites to move to predominantly white neighborhoods regardless of whites' own incomes, and regardless of their metropolitan area of residence, explains why there is strong nationwide support for the weak version of place stratification theory when the outcome is neighborhood racial composition.

In contrast, metropolitan heterogeneity has more of an impact on the locational attainment process when the outcome is neighborhood income. For moves into neighborhoods characterized by average family income, we find substantial variation across metropolitan areas in minorities' capacity to convert income into neighborhood quality, which in turn provides support for a broader representation of locational attainment models. A slight majority of metropolitan areas in the white-black comparison models (54 percent) and the white-Hispanic comparison models (57 percent) evince support for the "strong version" of place stratification theory, in which blacks and Hispanics are less able than whites to convert income into neighborhood socioeconomic status. However, a nontrivial number of metropolitan areas also evince support for spatial assimilation theory, where the highest-earning minorities achieve neighborhood parity with the highest-earning whites. These findings indicate that the theoretical model that best captures minorities' locational attainment process is contingent on three factors: (1) the minority group under consideration (African Americans versus Hispanics); (2) the neighborhood outcome of interest (racial composition versus economic status); and (3) the conditions of the specific metropolitan area.

In the second part of the analysis, we sought to isolate the characteristics of metropolitan areas that help to explain the white-black and white-Hispanic differences in both neighborhood outcomes and the effect of family income on those outcomes. We find that metropolitan-area levels of racial and ethnic residential segregation, racial and ethnic population composition, immigrant population size, poverty rates, and municipal fragmentation are significant predictors of minority-white differences in neighborhood attainment. Of particular relevance for place stratification theory (and conversely, for spatial assimilation theory), we find that Latinos face particular difficulty converting their socioeconomic resources into residential moves to whiter neighborhoods in metropolitan areas characterized by high levels of poverty.

Although this study employs a reasonably comprehensive set of contextual factors across a wide range of metropolitan areas, we acknowledge limitations to our analysis. These limitations point to possible directions for future research. First, although the observed metropolitan-area characteristics account for a large share of the variation in the minority-white difference in neighborhood attainment, these same metropolitan area characteristics do not account for much of the variation in the minority-white difference in the effect of family income on neighborhood outcomes. This finding may suggest that there are important metropolitan area characteristics affecting the location attainment process that are omitted from our analysis. Chief among these may be the extent of housing discrimination against black and Hispanic homeseekers. Future research might profit by attempting to identify, measure, and incorporate this and other metropolitan-area characteristics that shape minority locational attainment.

Second, a limited sample size prevents the inclusion of other racial and ethnic groups in the analysis and also restricts our ability to make distinctions between foreign-born Hispanics and native-born Hispanics. When data become available, future research might attempt to evaluate how Hispanic immigrant groups are being incorporated into specific areas by

comparing the locational attainment process across successive generations. Changing geographic contexts may facilitate or hinder the ability of newly arrived groups to assimilate, both spatially and socially, and how these newcomers are able to use their socioeconomic capital to attain residence in different types of neighborhoods could be the key to understanding the success or failure of future generations. Along similar lines, future research might also consider the effects of particular historical antecedents at the metropolitan level on current patterns of neighborhood attainment. For example, historical settlement patterns among different Latino ethnicities in different metropolitan areas may account for why our set of metropolitan-area characteristics explains little of the variation in the white-Hispanic difference in the effect of income on neighborhood attainment. Given these insights, studies of minority neighborhood inequality in general should give place-specific factors extra consideration in the future.

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Table 1

Descriptive Statistics for the Analyses of Neighborhood Attainment for Mobile White, Black, and Hispanic Households Heads from the Panel Study of Income Dynamics, 1990–2005

	Whites		Blacks		Hispanics	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Neighborhood outcomes						
% Non-Hispanic white	81.42	18.20	32.99	30.29	49.95	31.07
Average neighborhood income ($1,000s)	61.80	28.17	41.55	18.32	51.30	25.47
Individual characteristics						
Family income ($1,000s)	58.93	59.99	30.33	28.85	42.39	39.70
Year (1990 = 0; 1991 = 1; 1992 = 3; etc.)	6.10	4.29	5.98	4.34	7.03	4.49
Age	36.11	15.07	34.37	11.88	33.52	12.10
Female (1 = yes)	.30	.46	.53	.50	.36	.48
Married (1 = yes)	.48	.50	.28	.45	.49	.50
Number of children	.64	.98	1.30	1.38	1.25	1.28
Homeowner (1 = yes)	.41	.49	.16	.37	.26	.44
Persons per room	.52	.29	.72	.44	.83	.52
Metropolitan-area characteristics						
White-black residential segregation	59.78	13.86	65.75	10.88	na	na
White-Hispanic residential segregation	41.94	11.79	na	na	47.43	10.69
% pop. living in suburban area	45.54	31.32	45.29	32.77	35.63	30.98
Municipal fragmentation	.73	.23	.72	.23	.71	.21
% black	12.10	9.29	22.41	10.36	na	na
% Hispanic	9.61	10.94	na	na	23.50	18.68
% foreign born	6.71	8.06	6.19	8.42	9.68	12.03
Population size (ln)	13.96	1.14	14.43	.96	14.31	1.09
% living in poverty	8.24	5.59	8.28	6.11	8.21	7.31
% new housing past ten years	18.88	8.25	19.67	7.59	19.68	9.05

Table 2

Model Fit Statistics and Variance Components from the Multilevel Analyses of Neighborhood Attainment

Model Specification	Model df	AIC	Log-Likelihood	χ^2	χ^2 df	Variance Components: Level One Variance σ^2	Random Intercept τ^2_0	Random Slope τ^2_1	Random Slope τ^2_2	Random Slope τ^2_3
White-Black Comparisons										
Neighborhood outcome: % non-Hispanic white										
1. Null: $v_{0j} + v_{1j} + \varepsilon_{ij}$	12	96763	−48369			480.215	65.282	267.502	na	na
2. Null: $v_{0j} + v_{1j} + v_{3j} + \varepsilon_{ij}$	15	96747	−48358	21.91	3***	477.327	65.448	257.474	na	.011
3. Null: $v_{0j} + v_{1j} + v_{2j} + v_{3j} + \varepsilon_{ij}$	19	96749	−48356	5.25	4	477.019	53.568	255.143	.000	.011
4. Covariates: $v_{0j} + v_{1j} + v_{3j} + \varepsilon_{ij}$	43	95972	−47943	825.72	24***	452.240	24.753	139.067	na	.012
5. Full: w/cross-level interactions	59	95975	−47928	28.74	16*	451.944	24.326	158.101	na	.014
Neighborhood outcome: average family income										
1. Null: $v_{0j} + v_{1j} + \varepsilon_{ij}$	12	94768	−47372			401.378	115.930	75.221	na	na
2. Null: $v_{0j} + v_{1j} + v_{3j} + \varepsilon_{ij}$	15	94766	−47368	8.65	3*	400.399	115.968	113.185	na	.003
3. Null: $v_{0j} + v_{1j} + v_{2j} + v_{3j} + \varepsilon_{ij}$	19	94518	−47240	255.51	4***	387.115	168.984	213.129	.007	.016
4. Covariates: $v_{0j} + v_{1j} + v_{2j} + v_{3j} + \varepsilon_{ij}$	47	94246	−47076	328.73	28***	381.740	108.349	121.757	.007	.016
5. Full: w/cross-level interactions	63	94249	−47061	29.03	16*	380.997	98.227	130.287	.007	.017
White-Hispanic Comparisons										
Neighborhood outcome: % non-Hispanic white										
1. Null: $v_{0j} + v_{1j} + \varepsilon_{ij}$	12	53818	−26897			289.380	77.940	246.490	na	na
2. Null: $v_{0j} + v_{1j} + v_{3j} + \varepsilon_{ij}$	15	53783	−26877	41.02	3***	285.784	77.936	175.132	na	.038
3. Null: $v_{0j} + v_{1j} + v_{2j} + v_{3j} + \varepsilon_{ij}$	19	53781	−26871	10.47	4*	285.061	63.507	169.531	.000	.039
4. Covariates: $v_{0j} + v_{1j} + v_{3j} + \varepsilon_{ij}$	43	52940	−26427	888.25	24***	256.910	20.690	132.566	na	.038

Model Specification	Model df	AIC	Log-Likelihood	χ^2	χ^2 df	Variance Components: Level One Variance σ^2	Random Intercept τ^2_0	Random Slope τ^2_1	Random Slope τ^2_2	Random Slope τ^2_3
5. Full: w/cross-level interactions	59	52937	−26409	35.70	16**	255.976	20.555	140.497	na	.038
Neighborhood outcome: average family income										
1. Null: $v_{0j} + v_{1j} + \varepsilon_{ij}$	12	57511	−28743			535.740	100.210	66.060	na	na
2. Null: $v_{0j} + v_{1j} + v_{3j} + \varepsilon_{ij}$	15	57469	−28720	47.46	3***	529.615	101.354	523.953	na	.054
3. Null: $v_{0j} + v_{1j} + v_{2j} + v_{3j} + \varepsilon_{ij}$	19	57306	−28634	171.65	4***	509.286	141.632	541.530	.005	.055
4. Covariates: $v_{0j} + v_{1j} + v_{2j} + v_{3j} + \varepsilon_{ij}$	47	57054	−28480	307.89	28***	495.875	84.932	532.462	.005	.050
5. Full: w/cross-level interactions	63	57062	−28468	23.31	16	494.337	77.073	626.898	.005	.062

Note: na = not applicable

* $p < .05$

** $p < .01$

*** $p < .001$ (two-tailed tests)

Table 3

Null Specified Multilevel Models Predicting Neighborhood Attainments for White, Black, and Hispanic Inter-Neighborhood Migrants: Panel Study of Income Dynamics, 1990–2005

	White-Black Comparison Models				White-Hispanic Comparison Models			
	Model 1a		Model 2a		Model 1b		Model 2b	
	Neighborhood Outcome: % Non-Hispanic White		Neighborhood Outcome: Average Family Income		Neighborhood Outcome: % Non-Hispanic White		Neighborhood Outcome: Average Family Income	
	Main Effects for Whites	White-Black Difference	Main Effects for Whites	White-Black Difference	Main Effects for Whites	White-Hispanic Difference	Main Effects for Whites	White-Hispanic Difference
	β	β	β	β	β	β	β	β
Individual characteristics								
Intercept	84.771***	−23.287***	54.510***	−10.500***	84.898***	−.973	54.424***	−3.357
Family income ($1,000s)	.016**	.116***	.127***	−.004	.017***	.163***	.126***	.009
Inverse Mills ratio	4.072***	.850	−.232	1.788	3.994***	−5.879**	−.193	−1.448
Year (1990 = 0; 1991 = 1; 1992 = 3; etc.)	−.416***	.181	2.176***	−.507***	−.431***	−.466**	2.167***	−.795***
N level one (residential moves)	10,675		10,675		6,263		6,263	
N level two (metropolitan areas)	291		291		278		278	

Note: Family income is centered at $125,000.

*$p < .05$

**$p < .01$

***$p < .001$ (two-tailed tests)

Table 4

Fully Specified Multilevel Models with Cross-Level Interactions Predicting Neighborhood Attainments for White, Black, and Hispanic Inter-Neighborhood Migrants: Panel Study of Income Dynamics, 1990–2005

	White-Black Comparison Models				White-Hispanic Comparison Models			
	Model 1a		Model 2a		Model 1b		Model 2b	
	Neighborhood Outcome: % Non-Hispanic White		Neighborhood Outcome: Average Family Income		Neighborhood Outcome: % Non-Hispanic White		Neighborhood Outcome: Average Family Income	
	Main Effects for Whites	White-Black Difference	Main Effects for Whites	White-Black Difference	Main Effects for Whites	White-Hispanic Difference	Main Effects for Whites	White-Hispanic Difference
	β	β	β	β	β	β	β	β
Individual characteristics								
Intercept	81.497***	−25.497***	60.961***	−19.074***	82.476***	3.083	62.036***	−5.446
Family income ($1,000s)	.012	.108***	.129***	−.037	.009	.145***	.127***	.007
Inverse Mills ratio	−10.228	24.264**	−7.168	11.520	−11.617*	−4.861	−7.572	22.032
Year (1990 = 0; 1991 = 1; 1992 = 3; etc.)	−.647*	1.051**	1.963***	−.158	−.693***	−.054	1.715***	.196
Age	.199	−.487**	.142	−.216	.231*	−.021	.147	−.299
Female (1 = yes)	.462	−1.277	1.536*	−.545	.034	−5.769***	1.311	−1.527
Married (1 = yes)	3.534**	−1.435	.776	.179	3.517***	−3.368	.913	−4.791
Number of children	1.128	−2.599**	.299	−1.538*	1.126*	−2.273	.344	−3.931*
Homeowner (1 = yes)	7.049	−10.252*	2.488	−2.981	7.673**	3.331	2.834	−11.448
Persons per room	−4.095*	1.669	−6.810***	6.372**	−4.107**	−.876	−7.092***	9.526*
Metropolitan-area characteristics								
White-black residential segregation	.155**	−.033	.271***	−.260				
White-Hispanic residential segregation					.037	.007	.282***	.139
% pop. living in suburban area	.036	−.169**	.032	.015	−.002	.152	.029	.172
Municipal fragmentation	12.985***	−21.561**	−7.106*	3.661	12.928***	−14.920	−5.549	27.533
% black	−.230**	−.534**	−.146	.175				
% Hispanic					−.452***	−.244	−.057	.406
% foreign born	−.518***	.233	.498***	−.438*	−.257***	.523	.450***	−.177
Population size (ln)	−2.239***	−7.347***	3.497***	−5.027**	−1.814***	−3.787*	3.524***	−5.466

	White-Black Comparison Models				White-Hispanic Comparison Models			
	Model 1a		Model 2a		Model 1b		Model 2b	
	Neighborhood Outcome: % Non-Hispanic White		Neighborhood Outcome: Average Family Income		Neighborhood Outcome: % Non-Hispanic White		Neighborhood Outcome: Average Family Income	
	Main Effects for Whites	White-Black Difference	Main Effects for Whites	White-Black Difference	Main Effects for Whites	White-Hispanic Difference	Main Effects for Whites	White-Hispanic Difference
	β	β	β	β	β	β	β	β
% living in poverty	.327*	1.045**	−.522**	−.007	.322**	−1.821**	−.457*	−.486
% new housing past ten years	−.029	.634**	−.070	.286	−.030	.065	−.048	−.611
Cross-level interactions: Metropolitan-area characteristics x income								
White-black residential segregation	.000	.005*	.001	.000				
White-Hispanic residential segregation					.000	.002	−.001	.004
% pop. living in suburban area	.000	−.001	.001*	.000	.000	.001	.001*	.002
Municipal fragmentation	.000	−.125	−.075*	.037	−.002	−.119	−.055	.292
% black	.001	−.001	−.001	.002				
% Hispanic					.002***	−.002	.000	.005*
% foreign born	.000	−.001	.002*	−.002	−.002**	.006	.002	−.004
Population size (ln)	.001	−.009	.008	−.023	.000	.029	.012	−.032
% living in poverty	.002	.010*	−.007***	.002	.001	−.017**	−.007**	.000
% new housing past ten years	.001	.003	.000	.001	.000	.002	.000	−.006
N level one (residential moves)	10,675		10,675		6,263		6,263	
N level two (metropolitan areas)	291		291		278		278	

Note: Family income is centered at $125,000. All other continuous variables are grand mean centered.

* $p < .05$

** $p < .01$

*** $p < .001$ (two-tailed tests)