

Preliminary Draft
Not for quotation

**Status Caste Exchange:
Preferences for Race and Poverty Status of Neighbors
in Large U.S. Metropolitan Areas, 1970-2000:**

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* This research was supported by the Office of Policy Development and Research, U.S. Department of Housing and Urban Development Grant H-21443RG. Emilia Paiva-Turra provided invaluable research assistance in compiling the database. I am grateful for comments on an early version of this paper from Leah Brooks, Ken Kuttner, Albert Saiz, participants in the Population Studies Colloquium and the Real Estate Seminar at the University of Pennsylvania.

April 16, 2007

Abstract

This paper examines the effects of race and income of neighbors on racial segregation using consistently-bounded census tract data for 36 large metropolitan areas from 1970 to 2000. For Northeastern and Midwestern MAs, with the greatest levels of racial segregation in the nation, racial integration occurs consistent with status caste exchange: non poor African Americans and poor non African Americans are shifting to the same neighborhoods. A fixed effect model analyzes how a census tract's end of the decade proportions of the metropolitan area's population in each race and poverty status group are affected by the proportions of all other race and poverty status groups resident in a census tract at the start of the decade, the rate of change in those proportions over the decade, and other census tract characteristics that change between 1970 and 2000.

1. Introduction

An extensive research literature that spans the disciplines of economics, sociology, geography, and regional science has quantified the magnitude and sources of segregation by race within metropolitan areas ("MAs"). The topic which has generated the largest amount of research is the measurement of the relative importance, and sometimes the mere existence, of preferences for neighbors of own race, preferences against neighbors of another race, racial differences in preferences for non-racial characteristics of neighborhoods, and racial differences in income or socioeconomic status, to the observed levels of racial segregation. While there is broad consensus that racial segregation cannot be completely, or even mostly, explained by the higher poverty rates, or lower incomes, of African Americans or by their preferences to live with their own race, there is more disagreement about the magnitude of the contribution of racial discrimination – that is, the preferences of non African Americans not to live in the same neighborhoods as African Americans – to the levels of racial segregation.

This paper presents new evidence on the roles of racial differences in preferences for racial and/or income homogeneity of neighbors and for various

other attributes of neighborhoods (i.e., not their racial or poverty composition) and of racial differences in income on racial segregation in the largest MAs in the United States. The study uses some new approaches to these well-studied issues. First, I consider the match between the incomes of African Americans and of non African Americans in integrated neighborhoods. Status caste exchange theory, a hypothesis about the incidence of interracial marriage in the presence of racial prejudice, is tested as an explanation for racial integration of neighborhoods. By considering income, as well as race, of neighbors, status caste exchange theory provides a new interpretation of the frequent finding that higher income African Americans live in more racially integrated neighborhoods than do lower income African Americans. Specifically, if the higher integration levels of *higher* income African Americans occur because they reside in neighborhoods with *lower* income non African Americans, the observed racial integration is consistent with racial prejudice of non African Americans as the source of segregation. Furthermore, such patterns of racial segregation by income are not consistent with either African Americans' lower incomes or preferences to live with own race being the sources of their segregation

Second, neighborhood characteristics, other than racial and income composition of residents, are controlled more precisely than in previous studies. Fixed effect analyses allow control for unobserved neighborhood qualities, improving the estimates of the effects of racial and poverty composition, independent from the unobserved other neighborhood characteristics that are correlated with these compositions.

Third, by restricting the empirical analysis to large MAs, the results more precisely isolate the effects of racial and poverty composition of neighbors, versus other characteristics of neighbors and neighborhoods, in creating racial segregation in our most segregated large MAs, where the majority of the urban African American population resides.

The next section reviews how the research literature on the sources of racial segregation has dealt with the income by race of residents in integrated neighborhoods, racial differences in preferences for neighborhood characteristics, and large versus small MAs. Section 3 describes the data used in the analyses and compares of racial segregation levels within large MAs by region. Section 4 describes the approach used to test the empirical implications of status caste exchange and other hypotheses about the sources of racial segregation. Section 5 presents the results and Section 6 the conclusions.

2. Past Research

Racial segregation arises from several potential sources, including racial differences in income or socioeconomic status, racial differences in relative preferences for attributes of neighborhoods (other than their racial composition), and racially-based preferences for neighbors/housing discrimination. Dawkins (2004) provides a particularly detailed (and cross disciplinary) review of this vast literature that will not be repeated here. Rather, I will focus on how previous research on the sources of racial segregation has dealt with the specific issues addressed by this paper:

- The extent to which African Americans and non African Americans have similar incomes when residing in integrated neighborhoods.
- Racial differentials in neighborhood characteristics other than race or income compositions, which may be correlated with racial and income composition.
- Racial segregation in the large MAs where most African Americans live.

Racial Differences in Income or Socioeconomic Status

Several recent studies have found that higher income (or socioeconomic status) African Americans are more likely to reside in racially integrated neighborhoods than poorer African Americans (see, for example: Massey and Fischer (1999); Iceland et. al. (2005); Fischer (2003); Clark (2007)). Some, Clark in

particular, have argued that these results show that racial differences in income or in socioeconomic status, rather than housing discrimination or the prejudice of white residents, cause racial differences in residential locations, and, therefore, racial segregation within metropolitan areas (MAs). Simply, African Americans live in different neighborhoods because they cannot afford to live in the same neighborhoods as non African Americans. Therefore, as racial differences in incomes decrease, so would racial segregation.

But, do the now well-documented lower levels of racial segregation experienced by higher income African Americans (relative to lower income African Americans) necessarily imply that income, and not the racial preferences of non African Americans, is the source of the greater segregation of low income African Americans? It depends on whether higher income African Americans are settling in integrated neighborhoods on the same terms as non African Americans. If higher income African Americans were integrating neighborhoods that were of the same overall quality as the neighborhoods occupied by non African American and were paying equivalently to do so, then their integration would be consistent with income being a source of the higher rates of racial segregation for lower income African Americans. If, however, higher income African Americans were integrating neighborhoods that have more crime, worse schools, and/or lower income neighbors than those neighborhoods occupied by equivalent non African Americans, then the greater levels of integration of higher income African Americans would be consistent with racial differences in opportunities to access better neighborhoods. The greater integration of higher income African Americans would be consistent with racial preferences of non African Americans leading to racial segregation of African Americans.

Two recent studies of the amenity characteristics of the integrated neighborhoods in which higher income African Americans live suggest that those neighborhoods are “worse” than those occupied by non African Americans

of equivalent income, indicating that racial prejudice affects the ability of high income African Americans to move to integrated neighborhoods. Alba et. al. (2000) find that African Americans in Chicago, Cleveland, and Detroit live in neighborhoods in which the median household income of their white neighbors is lower than is the incomes of the neighbors of whites with the same incomes. Friedman and Rosenbaum (2007), while not quantifying the levels of racial integration in neighborhoods, find that African Americans reside in worse neighborhoods – as measured by such characteristics as trash, bars on windows, and abandoned buildings – than whites of similar education and income, regardless of whether their neighborhoods are in more segregated central cities or more integrated suburbs. While these studies provide some evidence that African Americans compromise on other neighborhood characteristics to obtain integrated neighborhoods, they do not provide definitive evidence. Alba et. al. only study three MAs in the Midwest and Friedman and Rosenbaum do not control for the level of integration nor the potential tradeoffs between integration and other neighborhood characteristics.

If non African Americans were to prefer neighborhoods with fewer or no African Americans,¹ then African Americans who desire to live in racially integrated neighborhoods would have difficulty doing so unless they offer benefits to non African American neighbors that “offset” their race.² If racial preferences of non African Americans were an important source of racial segregation, an exchange would be necessary for African Americans to shift into non African American neighborhoods. As higher income neighbors are

¹ See Charles (2006) for evidence on racial preferences based in direct questions about them.

² There are many ways by which racial prejudice can lead to segregated neighborhoods, including direct discrimination in the housing and lending markets, which stops African Americans from entering non African American neighborhoods, and neighborhood tipping. Schelling’s (1971) classic analysis of neighborhood tipping shows that segregation results when non African Americans’ preferences for the “maximum” proportion African American in their neighborhoods are less than the “minimum” proportion desired by African Americans.

preferred over those with lower incomes,³ higher income African Americans have an alternative which allows them to access racially integrated neighborhoods that is not available to the poor: they may move into non African American neighborhoods where the non African Americans are poorer than they are, compensating their non African American neighbors for their racial “caste status” with their higher socioeconomic status. Status caste exchange theory, a hypothesis proposed to explain inter-racial marriage pairings, predicts that African Americans of higher socioeconomic status marry whites of lower socioeconomic status, exchanging their “racial caste” position (a result of racial prejudice) for economic status.⁴ The application of this hypothesis to the selection of neighborhood locations yields the expectation that the racially integrated neighborhoods available to non poor African Americans are those in which their non African American neighbors are poorer. If racial preferences of non African Americans affect neighborhood locations of African Americans, then non poor African Americans may compensate their poor non African American neighbors for the disadvantages imposed by their racial caste position with the advantages resulting from their higher incomes.

An empirical test of whether racial integration of neighborhoods is consistent with status caste exchange requires a consideration of the extent to which income and preferences for own race neighbors affect neighborhood outcomes and, therefore, also account for residential segregation of African Americans. Specifically, if non African Americans prefer own race neighbors, and also higher income/socioeconomic status neighbors, while African

³ See, for example, Coulson and Bond (1990), Harris (1999), and Myers (2004).

⁴ Status-caste exchange theory has been used to explain outcomes in marriage markets. The theory, developed by sociologists Merton (1941) and Davis (1941) as a description of cross-caste marriages in India that might apply to cross-race marriages in the United States, hypothesizes that one marriage partner’s lower socioeconomic status is exchanged for the other’s “inferior” caste (or racial) status. A series of recent papers on interracial marriage have empirically supported the theory’s implications (Qian (1999), Kalmijn (1993), and Fu (2001)), although Rosenfeld (2005) presents some contrary evidence.

Americans prefer integrated neighborhoods,⁵ then higher income African Americans must offer their higher income status to lower income/socioeconomic status non African Americans (who prefer non African American neighbors) in exchange for racial integration of their neighborhoods. The status caste exchange hypothesis predicts higher rates of racial integration for higher income African Americans because they can integrate poorer non African American neighborhoods. In this case, it is not affordability of housing that leads higher income African Americans to integrate non African American neighborhoods and stops lower income African Americans from doing so, as some (Clark (2007)) have alleged. If the status caste exchange hypothesis explains residential integration, then higher status African Americans will reside in integrated neighborhoods in which the non African Americans are of lower income or socioeconomic status. The greater racial integration of higher income African Americans, then, reflects their ability to “pay off” non African Americans for their prejudice. The greater racial integration of higher income African Americans does not indicate less racial prejudice among higher income non African Americans.

In sum, the interpretation of any analysis of the variation in racial composition of neighborhoods with respect to the incomes or poverty status of African Americans must also consider the poverty status or income composition of the non African Americans in the neighborhood. If higher income African Americans are integrating neighborhoods with non African Americans of equivalent income, then income is a source of racial segregation. If higher income African Americans are integrating neighborhoods with non African Americans of lower income, then racial preferences of non African Americans are a source of racial segregation.

⁵ Such preferences are not necessarily due to a *direct* preference for non African American neighbors. Hwang and Murdock (1998) argue that residents may select neighborhoods based on their race composition because they believe that racial composition indicates the level of neighborhood resources. As a result, African Americans may seek integrated neighborhoods simply because these neighborhoods have, or attract, more resources.

Racial Differences in Preferences for Neighborhood Attributes

Another potential source of racial segregation is racial differences in preferences for other neighborhood attributes (that is, *not* the racial composition of neighborhood residents), such as types of housing structures and neighborhood amenities (golf courses versus basketball courts, old houses versus new houses, higher crime versus greater accessibility, public schools with tracking versus those without, or access to public transportation, churches, etc.). MA residents may not care about the racial characteristics of their neighbors, but their preferences for the non-racial characteristics of their neighborhoods may be shared disproportionately with others of their own race. Differences in characteristics across neighborhoods coupled with racial differences in preferences for such characteristics would also lead to differential settlement patterns by the races, which are not the result of either “intentional” racial sorting or socioeconomic status. The causation could also go the other way: in order to attract whites to a community, the community may purposefully acquire characteristics that have greater appeal to non African Americans. For example, a community may require membership in the neighborhood golf course in order to discourage African American residents (Strahilevitz 2006).

While there is a great deal of evidence of differences in the characteristics of neighborhoods by race of inhabitants (for example, see Boehm and Ihlanfeldt (1991), DiPasquale and Kahn (1999) and Myers (2004)), the evidence on whether those differences in neighborhood outcomes are due to racial differences in preferences for the characteristics, or to racial differences in income or to discrimination and racial prejudice is far less clear.⁶ Historic differences in settlement patterns within the MA by race, arising at least in part from historic

⁶ There is an extensive research literature on the effects of income versus discrimination on racial segregation of neighborhoods (for example, see Taeubers (1965), Farley (1977), McKinney and Schnare (1989), Massey and Denton (1993), Massey and Fischer (1999), Fischer (2003), Bayer et. al. (2004), and Iceland et. al.(2005) Far less attention has been paid, however, to the issue of whether observed racial differences in housing structures, quality, and non racial characteristics of neighborhoods are the result of differences in preferences for these neighborhood characteristics or in opportunities to access neighborhoods with these characteristics.

discrimination in real estate markets, have also altered the *current* locations of African Americans and non African Americans within MAs. If proximity to jobs or shopping, churches, or friends and other family members and to racial/ethnic group-specific goods, services, and entertainment are valued, then the attractiveness of particular neighborhoods will currently differ for African Americans and non African Americans.

To the extent that there are preferences for housing and neighborhoods that differ by race, characteristics of neighborhoods *other than the race composition of their residents* may account for racial segregation and must be considered when evaluating the effects of racial composition of neighborhoods on location outcomes. The interpretation of any empirical analyses of the variations in racial composition of neighborhoods with respect to the incomes or poverty status of African Americans must also consider all of the non racial and non income characteristics of neighborhoods that may be valued differentially by race and, therefore, result in different decisions about neighborhood location by race, before attributing racial composition differences to either racial preferences or income.

Racial Segregation in Large MAs

Some studies have tried to sort out the roles of income, African American preferences for residing with own race, non African American preferences against residing with African Americans, and preferences for specific housing or neighborhood characteristics by analyzing variations in segregation indices across MAs, that is by regressing MA segregation rates on other MA characteristics. For example, Logan et. al. (2004) regress the percentage change in the black-white segregation index (as well as other ethnicity segregation indices) between 1980 and 2000 on MA characteristics, including population size, age, region, growth, black representation, and changes in black-white income differences, for 255 MAs. Supporting the hypothesis that racial differences in economic status do not account for residential segregation, they find that the

change in the black/white income ratio within the MA had no effect on changes in segregation.

MA-level regression analyses require the inclusion of large numbers of MAs, and, therefore, estimate the effects of (or coefficients on) income or of other characteristics based mostly on the characteristics of small MAs that account for most of the MA observations, rather than on the characteristics of the very large MAs that have the greatest levels of segregation and most of the African American population. Larger MAs also have greater diversity among their neighborhoods across a wide range of characteristics. Racial segregation or dissimilarity indices for the large MAs used in this study (described below) are 11 to 17% higher than for the smaller MAs not used in this study.⁷ Furthermore, several studies have found that racial segregation is affected by population size in a non-linear pattern. For example, Farley and Frey (1994) found that small metropolitan areas were less segregated than large ones; Massey and Denton (1993) identified the 16 most segregated MAs in 1980 and all but one (Gary) are among the large MAs studied here; Logan et. al. (2004) found higher levels of racial and ethnic segregation in large MAs in 2000.

For these reasons, multivariate analyses of large numbers of MAs cannot reliably measure the effects of race, income, or other characteristics on racial segregation in the large MAs where most African Americans reside and that have the highest levels of racial segregation.

⁷ The source for these calculations is <http://trinity.aas.duke.edu/~jvigdor/segregation/index.html>, the Cutler-Glaesar-Vigdor Segregation Data. These data indicate that the racial dissimilarity indices averaged 0.80, 0.80, 0.70, and 0.64 for 1960 through 1990 respectively, substantially higher than the levels for all other MAs in their data set, which averaged 0.72, 0.71, 0.60, and 0.55 for the same years.

3. The Data

I study 40 large central cities, located in 36 MAs.⁸ I examine how poverty and racial composition affects MA population shifts across neighborhoods within these large MAs, after controlling for characteristics of the neighborhood. I analyze large MAs exclusively because racial and poverty segregation levels are greater in large MAs. I use the CMSA (consolidated metropolitan statistical area) and the PMSA (primary metropolitan statistical area) boundaries and designations of the U.S. Census for the 1990 Census to create a data set on the economic, demographic, and geographic characteristics of neighborhoods (census tracts) of these 36 large MAs for 1970, 1980, 1990, and 2000.

Because I am interested in how neighborhoods are changing with respect to the races and incomes of their occupants, it is critical to study neighborhoods that have the same boundaries over time. If boundaries shift over time, changes in race and income composition may be an artifact of boundary shifts and not of any change in where people live. The boundaries of census tracts, however, change each decade. I use the GeoLytics CensusCD Neighborhood Change Database (NCDB). GeoLytics reconfigures, or standardizes, the 1970, 1980, and

⁸ The 40 largest central cities in 1990 were: New York, NY; Los Angeles, CA; Chicago, IL; Houston, TX; Philadelphia, PA; San Diego, CA; Detroit, MI; Dallas, TX; Phoenix, AZ; San Antonio, TX; San Jose, CA; Baltimore, MD; Indianapolis, IN; San Francisco, CA; Jacksonville, FL; Columbus, OH; Milwaukee, WI; Memphis, TN; Washington, DC; Boston, MA; Seattle, WA; El Paso, TX; Cleveland, OH; New Orleans, LA; Nashville, TN; Denver, CO; Austin, TX; Fort Worth, TX; Oklahoma City, OK; Portland, OR; Kansas City, MO; Long Beach, CA; Tucson, AZ; St. Louis, MO; Charlotte, NC; Atlanta, GA; Virginia Beach, VA; Albuquerque, NM; Oakland, CA; and Pittsburgh, PA. I exclude Virginia Beach because of its small size in 1970 (at 172,000 ranked 78 in city size) and Albuquerque because of the small size of the MSA (77th largest in 1990). Long Beach is included in the Los Angeles CMSA. San Jose and Oakland are included in the San Francisco CMSA and Fort Worth is included in the Dallas CMSA. I add in Minneapolis-St. Paul, and Miami. Miami and Minneapolis are among the 50 largest cities and are primary central cities in the 23rd and 13th largest metropolitan areas, respectively. St. Paul is included with the Minneapolis PMSA.

The study MAs, listed by regional classification and central cities are: *Northeast*: Baltimore, Boston, New York, Philadelphia, Pittsburgh, and Washington, DC; *Midwest*: Chicago, Cleveland, Columbus, Detroit, Indianapolis, Kansas City, Milwaukee, Minneapolis-St. Paul, and St. Louis; *West*: Denver, Los Angeles, Phoenix, Portland, Tucson, San Diego, San Francisco-Oakland-San Jose, and Seattle; *South*: Atlanta, Austin, Charlotte, Dallas-Fort Worth, El Paso, Houston, Jacksonville, Memphis, Miami, Nashville, New Orleans, Oklahoma City, and San Antonio.

1990 census tract boundaries to those for 2000, allowing a comparison of the same geographic boundaries over time.⁹

There is another advantage to using the 2000 census tract boundaries for the 1970, 1980, and 1990 data. As the boundaries of census tracts were drawn for the express purpose of creating areas with homogeneous racial and income characteristics,¹⁰ they are problematic for measuring the extent of segregation by race or poverty status at any point in time. When changes are studied over time for the *same* geographic area so that the reconstructed boundaries are less likely to maximize the homogeneity of the area in the earlier years, census tract geography becomes less problematic. Fixed neighborhood or census tract boundaries are necessary for measuring changes in segregation over time. Analyses of segregation changes in MAs overtime, with changing census tract boundaries that are redrawn conditional on changes in income and racial characteristics, will also be biased toward finding higher rates of segregation.

Consistent with other studies, the data for the 36 large MAs show that racial segregation varies by region. Figure 1a illustrates the dissimilarity indices¹¹ for African Americans versus non African Americans¹² across census

⁹ GeoLytics uses geographic information system (GIS) software to overlay the boundaries of 2000 tracts with those of the earlier years to determine how tract boundaries changed between censuses. The 1990 block data were then used to determine the proportion of persons in each earlier tract that went into making up the new 2000 tract. These population weights were then applied to the various 1970, 1980, and 1990 tract level variables to convert them to 2000 tract boundaries. The population weights were used to convert all variables based on counts of persons, households, and housing units. Proportions were calculated by converting the respective numerator and denominator values and then recalculating the proportions.

¹⁰ See *Census 2000 Geographic Terms and Concepts* p. A11: "When first delineated, census tracts are designed to be relatively homogenous with respect to population characteristics, economic status, and living conditions."

¹¹ The segregation index, the Duncan Index of Dissimilarity, is calculated:

$$\frac{1}{2} \sum_i |P_i - nP_i|$$

where P_i is the proportion of the MA's African American population in census tract i and nP_i is the proportion of the MA's non African American population in census tract i .

The index takes on values between 0 and 1, where 0 indicates no segregation (the races are sorted identically across neighborhoods) and 1 indicates perfect segregation (African Americans and non African Americans live in completely different neighborhoods).

¹² In order to evaluate interactions between poverty and race, the entire population of the census tract must be included in each year in the analyses. If I were to analyze whites and

tracts for these MAs by region for the 1970, 1980, 1990, and 2000 U.S. Censuses. The index has decreased for MAs in every region in every decade. The racial segregation index was greatest for the Midwestern MAs in 1970 and remained so in every subsequent decade. The Northeastern MAs average the next highest indices followed by the South and the West. The West has experienced the greatest decline in racial segregation.

Figure 1b shows the average indices of racial dissimilarity for the poor only and Figure 1c does the same for the non poor only.¹³ If the greater poverty rates (i.e., lower income) of African Americans leave poor African Americans (PAAs) with fewer potential non African American neighbors (and vice versa for the non poor), then racial segregation indices that combine the poor and the non poor for MAs (Figure 1a) should be *higher* than the racial segregation indices that are measured separately for the poor (Figure 1b) or for the non poor (Figure 1c). Comparing the segregation levels reported on Figure 1a with those on Figures 1b and 1c, there is little evidence that the higher poverty rates of African Americans account for racial segregation. Overwhelmingly, the racial indices combining the poor and the non poor are *lower* than the indices within poverty groups.¹⁴

African Americans only, I may miss a large poor (or non poor) Hispanic or Asian presence in a census tract. I categorize the entire population as African American and non African American in order to concentrate on the racial group experiencing the greatest segregation (see Massey (2001)). The effects of Hispanic representation among non African Americans is controlled in the regression analyses presented below. Unfortunately, data are not reported for Asians in 1970. Because the controls for Hispanic do not alter the results, however, there is no reason to believe Asian representation would change the results reported below.

¹³ The racial segregation index for the poor compares the racial segregation of PAAs and PnAAs, calculated as:

$$\frac{1}{2} \sum_i |AAP_i - nAAP_i|$$

where AAP_i is the proportion of the MA's African American poor population in census tract i and $nAAP_i$ is the proportion of the MA's non African American poor population in census tract i . A similar calculation is performed for the non poor. A limitation of the dissimilarity index is that it compares only two groups, so the representation of other groups, such as the non poor of either race are not included in the racial segregation index for the poor.

¹⁴ The combined index is higher than the indices within poverty groups only for the Northeastern MAs in 1970.

Racial segregation indices are greater within poverty groups than they are for the aggregated poor and non poor populations only if racial integration occurs across poverty groups, for example by integrating non poor African Americans (nPAAAs) and poor non African Americans (PnAAAs), as implied by the status caste exchange hypothesis. Aggregate dissimilarity indices may also be higher than the indices by poverty status as the result of other shifts that combine groups of both opposite race and opposite poverty statuses. In particular, gentrification, which is commonly defined as higher income whites moving into older neighborhoods occupied by PAAAs, would also result in aggregated dissimilarity indices that are lower than the poverty group-specific indices. In the instances either of status caste exchange or gentrification, the greater incidence of poverty among African Americans does not *cause* the racial segregation of African Americans. Either PAAAs must be more likely to reside with non African Americans when they are non poor (i.e., gentrification), or nPAAAs must be more likely to reside with non African Americans when they are poor (status caste exchange). Of course, both status caste exchange and gentrification could be occurring simultaneously. The greater aggregated dissimilarity indices than those computed by poverty status, as found here, are consistent with both gentrification and status caste exchange. The analyses which examine whether nPAAAs are shifting into neighborhood with PnAAAs, or non poor non African Americans (nPnAAAs) are shifting into neighborhoods with PAAAs, are presented in the next two sections. These analyses find that status caste exchange, and not gentrification, is the explanation.

There is no obvious overall pattern of racial segregation varying by poverty status. In 1970, racial segregation was higher for the non poor than for the poor in the South (.79 vs. .73), in the Northeast (.77 vs. .73) and in the Midwest (.86 vs. .80), but equivalent in the West. Rather large decreases in racial segregation among the non poor between 1970 and 1980 changed these patterns by 1980, resulting in greater racial segregation among the poor for all four

regions. 1990 brought another reversal, with more racial segregation among the non poor, as racial segregation dropped markedly among the poor between 1980 and 1990 in the South and Midwest. By 2000, the Southern and Western MAs, with lower overall racial segregation, have higher racial segregation among the poor, while the Northeastern MAs have higher racial segregation among the non poor. (The Midwestern MAs have equivalent racial segregation among the poor and non poor.) MAs in the West have the lowest racial segregation for both the poor and the non poor while the Midwest has the highest for both groups.

The patterns of racial segregation by poverty status across both time and space within these large MAs suggest that both race and income of residents are important in determining whether neighborhoods become racially integrated and also to interpreting the role of income versus racial preferences in creating segregation. Because dissimilarity indices are limited to the comparison of two groups, they cannot measure the simultaneous effects of other characteristics of residents or of neighborhoods on segregation outcomes. Beyond the comparisons made here, these indices cannot sort out the effects of direct or discriminatory preferences for race or income of neighbors from the effects of racial differences in preferences for nonracial/non income characteristics of neighborhoods that are correlated with the racial and income composition of neighborhoods. They also do not consider the economic status of the non African Americans who reside in neighborhoods with higher (or lower) income African Americans. Higher income African Americans, for example, may reside in less racially segregated neighborhoods that have non African Americans of lower income, of comparable income, or of higher income.

The next section describes an analytical approach that allows us to analyze how neighborhoods are integrating by race and income in large MAs across U.S. regions. The approach simultaneously considers the match between race and poverty status of neighbors and own race and poverty status and also controls

for the role of other (non racial, non poverty) characteristics of neighborhoods that might be mistaken for race or poverty effects if not considered.

4. The Approach

There are two methodological issues that arise in measuring the effects of racial differences in socioeconomic status or income and in preference for non racial attributes of neighborhoods versus the effects of racial preferences on segregation in large MAs. First, as there are few such MAs (36 in this study), the numbers of observations are too few for multivariate statistical analyses of the MA segregation indices. Second, it is difficult to control for all the characteristics of neighborhoods, other than their racial and poverty composition, which affect location outcomes by race and income. The first issue is addressed by the specification of the dependent and independent variables in the analysis; the second by the estimation technique.

Race and Poverty Census Tract Populations as Percent of MA Population

Prior studies of the connections between poverty or income and racial segregation have examined the correlates between various MA characteristics and segregation levels for the entire MA.¹⁵ In order to generate sufficient observations for statistical analyses, they use samples which are largely made up of smaller MAs. Because this study focuses on the 36 largest MAs and separates effects by region, there are an insufficient number of observations to analyze overall MA segregation levels. A study focusing on the sources of, and connections between, poverty and racial segregation levels only in large MAs requires a different strategy. The MA's proportions of a race-income group residing in a census tract are the components of the racial dissimilarity indices which measure poverty and racial segregation levels. Therefore, changes in

¹⁵ For example, Abramson and Tobin (1995), Massey and Fischer (2000), and Logan et. al (2004).

those proportions for individual census tracts create the variation in MA segregation indices. I use the components of the dissimilarity indices (the proportions of each race-income group residing in census tracts), which are measured in each year for each census tract, to analyze shifts in poverty and racial segregation for large MAs by region. Residential segregation by poverty status or by race, as illustrated in Figure 1, arises from changes in the census tract's proportion of the MA's non African Americans relative to its changes in the proportion of African Americans within each poverty group.¹⁶ I examine how the census tract *shares* of MA population categorized by race and poverty status at the end of the decade are related to the demographic, economic and physical characteristics of the census tracts at the start of the decade.

There are other advantages to using the proportions of the total MA race-income group populations residing in the tract, as opposed to the proportions of the census tract populations that are in the race-income group, as the dependent (and independent) variables in a regression analysis. First, the sum of the proportions of any MA race-income population across tracts in an MA in a year is equal to 1. Therefore, the mean value of the proportion for any MA (which is 1 divided by the number of census tracts in the MA) is the same for each race-income group, allowing clear comparisons across race-income groups and their

¹⁶ For example, a census tract may have experienced a relative increase in its representation of any racial income group relative to the rest of the MA for one, all, or a subset of the following reasons:

1. One racial income group in the initial period may have disproportionately relocated to other census tracts in the MA or left the MA.
2. The census tract may have attracted fewer of the racial income group's in-migrants to the MA over the time period than did other census tracts.
3. MA residents of the racial income group from elsewhere in the MA (or from outside the MA) in the initial period may have disproportionately relocated to the census tract.
4. Residents of the census tract may be the same people as in the initial period, but they may have become relatively poorer or richer over the decade. (Of course, they do not change race.)

All, or some subset, of these dynamic processes shift the proportions of the MA residents who live within any census tract and account for changes in racial and poverty segregation within the MA over time.

coefficients, even when the group populations are of different overall sizes. Second, the proportion of the MA poor population in the census tract is independent of the mean and the variance in the overall MA income distribution.¹⁷

Fixed Effect Regression Analysis

It is extremely difficult to measure all of the attributes of a neighborhood that are valued by residents. When the racial and poverty compositions of the neighborhood are observed, and other characteristics that are correlated with racial and poverty compositions but that matter in neighborhood choice are not observed, an analysis of the effects of race and poverty composition themselves on neighborhood outcomes will be biased toward finding that race or poverty composition affects neighborhood characteristics.¹⁸ A common approach used to control for unobserved neighborhood characteristics is a fixed effect model. Fixed effect models have been widely used in recent years to control for the effects of unobserved characteristics when analyzing panel data sets, data sets which include several observations on the same person, firm, or neighborhood at different time periods. By measuring the effects of changes in observed characteristics for neighborhoods whose unobserved characteristics are assumed to be constant over time, one can obtain consistent estimates of the effects of the observed characteristics.

Model Specification

Specifically, I model the MA's proportion of a race-poverty status group resident in a census tract as a *fixed-effect panel* of the form:

¹⁷ Jargowsky (1996) criticizes the multilevel income dissimilarity indices used by Massey and Eggers (1990) for not being independent of mean MA income or its variance, thus confounding "changes in the underlying income distribution with changes in spatial organization." The proportion of the MA poor (African American or non African American) in a census tract has the same mean for the MA in each time period.

¹⁸ Myers (2004) finds that, even with many neighborhood controls in an analysis, there is evidence of correlation between the error term and the regressors, leading to biased estimates of coefficients.

$$s_{i,j,t+1} = \alpha + \beta s_{i,k,t} + \gamma X_{i,t} + \phi \Delta s_{i,k,t+1} + \mu_i + \epsilon_{it} \quad j \neq k$$

where $s_{i,j,t+1}$ is the MA's proportion of race-income group j resident in census tract i in period $t+1$, $X_{i,t}$ is a vector of census tract i 's non-fixed characteristics (other than race and poverty composition) in period t , $\Delta s_{i,k,t+1}$ is the change over the decade from t to $t+1$ in the MA's proportion of the race-income groups other than j resident in census tract i , μ_i is the unobserved census tract i fixed effect, α , β , γ and ϕ are parameters to be estimated, and ϵ_{it} is a random error term.

A series of Hausman-type tests were performed to see if μ_i is best treated as a fixed or random effect, and in each case, the random effects model was strongly rejected. Unobserved characteristics of neighborhoods are correlated with the intrametropolitan shifts of residents by race and income providing evidence for the share preferences hypothesis. Since the estimation controls for fixed effects for the unobserved attributes of each census tract, only the variation *within* a census tract produces the estimates of the α , β , γ and ϕ 's. Basically, the fixed effect model controls for all of the attributes of a neighborhood that are constant between 1970 and 2000.¹⁹

By using fixed effects, one is not able to estimate the effects of any census tract attribute that does not change, that is the fixed effects. These effects are "controlled for" when estimating the race and income composition effects, but are not separately evaluated. The only neighborhood effects that can be analyzed are those that change. I identify three such effects.

First, I measure the relationships between the proportions of each other racial-poverty group at the beginning of the decade and the proportions of the dependent variable racial-poverty group in the census tract at the end of the decade. The correlations between a race-income group representation and initial representations of the other groups, after other characteristics of the neighborhood are controlled, arise as direct cause and effect (i.e., evidence of

¹⁹ The constant attributes include, of course, the location of the tract, including its relationship to all other points in the MA.

white flight, preferences for social capital, or preferences for homogeneous neighborhoods).

Second, because the current proportion of the MA's race-income group in a census tract is modeled as affected by the decade ago proportions of the other race-income groups in a neighborhood, the rate of change in the other groups' proportions over the decade reflects whether the changes in the other groups adds to the race or income effects. The coefficients on changes in a group's representation reflect race/income preferences as well as moves to census tracts that are growing versus declining. For example, if the initial proportions of group A decrease (increase) the subsequent proportions of group B at the end of the decade, and increases in the MA's proportion of group A over the decade also decrease (increase) the subsequent proportions of group B, then group B is showing a strong preference against (for) group A. Alternatively, if increases (decreases) in all other groups' proportions increase (decrease) A's proportions, then A is moving to census tracts with growing (declining) populations. If the fixed effects and the controls for other neighborhood characteristics adequately control for the non racial and non income characteristics of a neighborhood, the coefficients of the initial or start of the decade proportions of other racial-income groups and their rate of change over the decade are interpreted as indicating the role of white flight, preferences for social capital, or preferences for homogeneous neighborhoods in poverty and racial segregation outcomes.

Third, I add the physical and socio-economic characteristics that affect the relative attraction of the census tract for the various racial-poverty groups that change over time (that is, are not fixed census tract effects). I use one measure of the non-fixed physical effects, the housing stock, within a census tract: population density at the start of the decade. If higher income residents prefer to live in houses on larger lot sized, they live in less densely populated neighborhoods. When other attributes of the neighborhood are the same, neighborhoods with greater population densities, then, are less attractive to

higher income residents. Similarly, there are potential differences in the economic circumstances by race of both the poor and the non poor. By adding a control for the average household income in a census tract at the start of each decade relative to the MA average, I control for changes in housing or land values in the neighborhood that may be affordable differentially for African American and non African American households of the same poverty status. Finally, the 1970 through 2000 period has seen a substantial increase in the proportion of the non African American population that is Hispanic and Asian. Some studies have conflicting findings on whether MAs with more ethnic diversity have greater racial segregation.²⁰ The increases in Hispanic representation have also been regionally concentrated, more in the West and South than in the Northeast or Midwest, especially before 1990. I control for the proportion of the neighborhood population who is Hispanic at the start of each decade.²¹

5. The Results

Table 1 shows the results of the fixed effects regression analyses of the census tract's proportion of the MA's population for each racial-income group at the end of each decade, by region. If the fixed effect analysis controls for all of the characteristics of neighborhoods other than the racial and poverty composition of its residents, the coefficients for the racial and poverty composition of residents reported on Table 1 isolate the "preference" effects for race and poverty composition of neighborhoods on the shifts in populations within MAs. The dependent variable, listed at the heading of each column, is the end of the decade's proportion of the MA's population of the racial-income

²⁰ For example, McKinney and Schnare (1989) and Frey and Farley (1996) found greater racial segregation in such MAs, while White and Glick (1999) found the opposite.

²¹ I cannot control for Asian presence because these data were not collected in 1970.

group residing in the census tract. The dependent variables are the components, then, of the racial and poverty dissimilarity indices for the MA.²²

The first panel of rows includes the effects, by region, of the initial representation at the beginning of the decade, and the amount of change over the decade, of the opposite poverty group, same race group, on the proportion of each of the MA's racial-poverty status groups residing in the census tract at the end of the decade. The coefficients indicate how the poverty compositions of a neighborhood's residents at the start of the decade, and the shift of poverty groups over the decade are associated with the proportion of each racial-poverty status group in the neighborhood, after controlling for the proportions of opposite race groups in the neighborhood. All of the coefficients for the opposite poverty same race groups' representation at the beginning of the decade are positive, large, and highly significant. A positive coefficient for any of the race-poverty categories denotes a move toward integration. In the case of the coefficients in the first panel, a positive coefficient represent poverty integration within racial groups. Among large MAs in all four regions, there is a strong tendency to shift toward neighborhoods with initially more of the opposite poverty status within your race. The attraction of the "opposite" poverty status is clearly, however, larger for the poor of both racial groups in all regions.²³ The attraction of the poor to the non poor within each racial group is stronger than the attraction of the non poor to the poor. This result is consistent with housing filtering from the non poor to the poor over time.²⁴

²² Note that by construction, the means of the dependent variables and of the initial proportions of the race-income group within a MA at the start of the decade are equal to one divided by the number of census tracts in the MA and are, therefore, the same for all groups within each MA and also when added up to the regional level (See Table 2).

²³ For African Americans, the poor coefficients are greater than the non poor coefficients for each of the regions: 0.653 vs. 0.389 in the Northeast, 0.627 vs. 0.399 in the Midwest, 0.723 vs. 0.188 in the South, and 0.763 vs. 0.445 in the West. Similarly, for non African Americans, the coefficients are 0.563 vs. 0.191, 0.364 vs. 0.155, 0.463 vs. 0.307, and 0.398 vs. 0.225.

²⁴ See Mills and Hamilton (1984), pp. 100-5 for a discussion of house filtering.

The coefficients on the amount of change in each of these groups in the preceding decade are also generally positive and re-enforcing of the effects of initial representations, with some notable exceptions. For nPnAAs in all regions (fourth column for each region), however, an increase in the proportion of PnAAs *over the decade* decreased their increasing representation in a census tract. They shifted to neighborhoods with poor, but only if the poor were decreasing their relative representation in the neighborhood. A similar negative effect on the representations of PAAs of an increase in the proportion of nPAAs over the decade occurs in the Northeast and the South, while the opposite effect occurs in the Midwest and West. They shifted to neighborhoods with non poor, but not those that were attracting relatively more non poor. Because the decennial changes in the proportions of PnAAs (or of any other race-income group) are very small (see Table 2), however, the net effects of these changes on representation are also quite small.

The first panel results show that MA residents are willing to move into neighborhoods with more residents of their own race but of opposite poverty status, although neighborhoods with growing proportions of opposite poverty status neighbors were less attractive for nPnAAs and less accessible for PAAs in the Northeast and the South.

The second panel of rows shows the effects, by region, of the initial representation, and the amount of change over the decade, of the opposite race group, same poverty group, on the proportion of each of the MA's racial-income groups residing in the census tract at the end of the decade. The coefficients indicate how the racial compositions of a neighborhood's residents at the start of the decade, and the rate of shift in racial groups during the decade affect the proportion of each racial-income group in the neighborhood. Positive signs on coefficients indicate shifts toward racial integration within same poverty statuses. Among all four regions, there is generally a weaker (relative to the moves toward opposite poverty but same race groups) tendency to move toward

census tracts with more of the opposite race but same poverty status group. (Remember that the means of the independent variables are the same for all race-income groups in the same region, so that differences in coefficients reflect fully comparable differences in outcomes.) The one exception to this pattern is for nPAAs in the South and West who are shifting more toward nPnAAs (racial integration) than they are toward PAAs (poverty integration). This is consistent with the lower rates of racial segregation in these two regions and the greater rate of decrease in racial segregation among the non poor as shown in Figure 1c for the South and West.

The Western and Southern MAs, which experienced larger decreases in racial segregation between 1970 and 2000 (Figure 1) are also markedly different from the Northeast and Midwest in that there are consistent, and statistically significant, movements toward neighborhoods with more of the opposite race, same poverty group for all racial-poverty status group combinations. All signs for coefficients of initial proportions of opposite race same poverty are significantly positive and coefficients on changes are also positive, except for PAAs, in the South and West. While PAAs shift to neighborhoods with more PnAAs, neighborhoods with growth in PnAAs appear less accessible to PAAs in this region. The large MAs in the Northeast and the Midwest are different, however, with non African Americans shifting away from African Americans of same poverty status. And, while PAAs in these two regions are shifting toward PnAAs, they (as well as nPAAs) are shifting away from those census tracts with greater increases in the proportions of opposite race, same poverty.

The second panel results show that MA residents are less willing to shift toward neighborhoods with more residents of their own poverty status but of opposite race than they are toward neighborhoods with more residents of their own race but of opposite poverty status. The differential attractions of opposite poverty and opposite race groups in neighborhoods are particularly large for the Northeastern and Midwestern MAs.

The third panel of rows shows the effects, by region, of the initial representation, and the recent change in proportions, of the opposite race and opposite poverty status group on the proportion of each of the MA's racial-income groups residing in the census tract each year. Positive coefficients indicate shifts that decrease both racial and poverty segregation, while negative coefficients have the opposite effect. The majority of the coefficients in these rows are negative and significant, indicating that racial integration is not likely to occur among persons of the opposite poverty status and poverty integration is not likely to occur among persons of the opposite race. Simultaneous integration of persons of both different race and income is less likely than poverty integration within race or racial integration within poverty status. Comparing the coefficients in the third row panel to those in the second row panel, it is obvious that racial integration is more likely to occur among persons of the same poverty status.

Status caste exchange and gentrification would increase racial integration across poverty status groups. Status caste exchange would result in positive signs on the coefficients for initial proportions or rates of change in proportions of opposite race opposite income group for PnAAs and/or nPAAs (second and third columns for each region). Gentrification would result in positive signs on the coefficients for initial proportions or rates of change in proportions of opposite race opposite income group for PAAs and/or nPnAAs (first and fourth columns for each region). I find no evidence of gentrification. I find evidence consistent with status caste exchange in the Northeast, the Midwest, and the South for both PnAAs and nPAAs. NPAAs in the Northeast and Midwest shift more toward neighborhoods where the non African Americans are poor than where they are non poor (see coefficients of 0.098 vs. -0.011 and -0.049 vs. -0.083 in the Northeast and 0.135 vs. 0.053 and -0.085 vs. -0.154 in the Midwest). Similarly, PnAAs in the Northeast and Midwest shift more toward neighborhoods where the African Americans are non poor than where they are

poor (see coefficients of 0.020 vs. 0.003 and 0.046 vs. 0.010 in the Northeast and 0.021 vs. -0.021 and 0.021 vs. -0.004 in the Midwest).²⁵ These shifts serve to counteract the racial segregation effects implied by the smaller coefficients in the second row panel for the initial proportions of racial groups in the same poverty status in these regions relative to the West.

The fourth panel of rows shows the effects of the physical and socio-economic characteristics of census tracts that change between 1970 and 2000 (that is, those that are not fixed effects). Population density does not behave as expected; that is, the coefficients are not negative (the sign indicating a relatively greater preference for larger lot sizes and newer houses farther from the center) for the non poor and positive for the poor and are not greater in the Northeast and Midwest relative to the South. Physical attributes of the census tract, however, may be better controlled with the fixed effect than with changing population densities.

Hispanic representation at the start of the period reduces the end of decade proportions of nPnAAs and increases the proportions of PnAAs (who may be themselves disproportionately Hispanic). More Hispanic representation, then, leads to increased poverty segregation among non African Americans. Hispanic representation at the start of the period surprisingly reduces the proportions of African Americans in the South and West, indicating that African Americans are not integrating with non African Americans who are Hispanic. Hispanic representation has no effect on the end of decade proportions of African Americans in the Northeast and Midwest.

As expected, higher average household income within the census tract attracts more nPnAAs and fewer PnAAs in every region. Average household income within the census tract has no significant effect, and is often of unexpected sign, for African Americans. The average household income control

²⁵ The South also has positive signs in the third panel for PnAA and nPAA, but the magnitudes of the coefficients are lower than for the second panel.

is important to the analyses, however, because African Americans are likely to have lower incomes than non African Americans within each poverty status.

6. Conclusions

In the large MAs of the Midwest and the Northeast, with the highest levels of – and the slowest rates of decrease – in racial segregation in the nation, racial integration appears to occur through a process of status caste exchange. Non poor African Americans racially integrate neighborhoods that include poor non African Americans and their higher income provides an incentive for poor non African Americans to stay. African Americans shift to non African American neighborhoods and get the non African Americans to stay by compensating them for the disadvantage of their racial caste with the advantage of their higher income. In the West, with the lowest levels of, and the most rapid decreases in, racial segregation levels, racial integration is proceeding, however, by racial integration among people of equivalent income or poverty status.

To summarize the empirical evidence that status caste exchange is the source of racial integration in our most segregated large MAs:

First, racial segregation is greater within poverty status groups than for the total population (combining poor and non poor), indicating that racial integration is occurring across poverty groups.

Second, after controlling for neighborhood characteristics (including median household income in the neighborhood), non poor African Americans are more likely to shift toward neighborhoods with poor than with non poor non African Americans in the Northeastern and Midwestern MAs. Similarly, poor non African Americans are more likely to shift toward neighborhoods with non poor than with poor non African Americans in the same regions. The Northeast and the Midwest have greater racial segregation than the South or the West. There is no evidence that non poor non African Americans are shifting toward

neighborhoods with more poor African Americans, as implied by gentrification processes.

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Figure 1a
Racial Segregation in Large MSAs by Region, 1970-2000

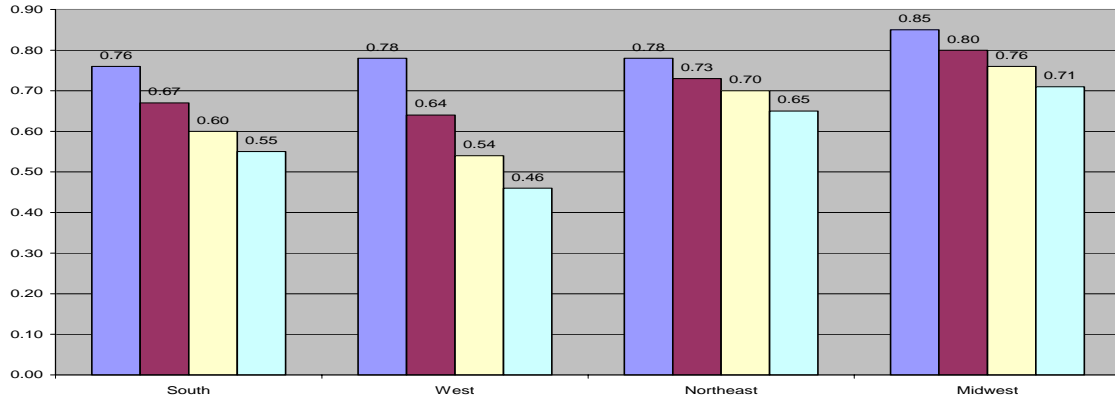


Figure 1b
Racial Segregation of the Poor in Large MSAs by Region, 1970 to 2000

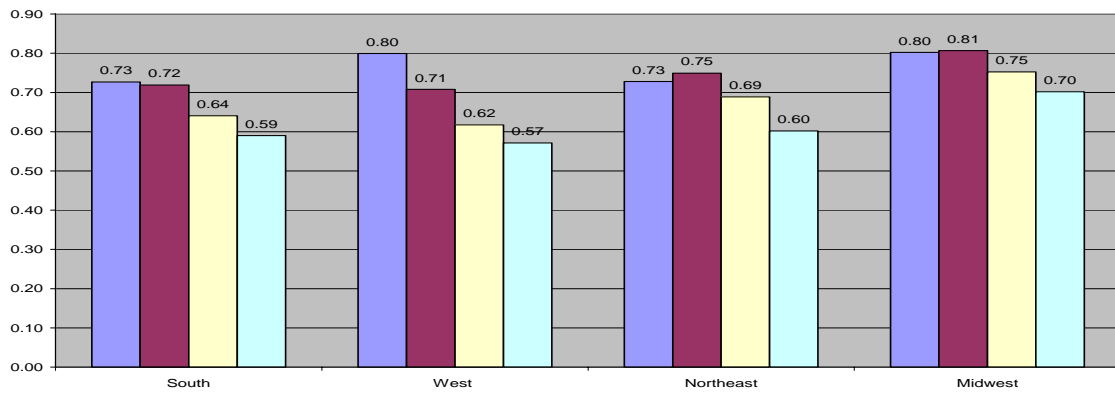


Figure 1c
Racial Segregation of the Non Poor in Large MSAs by Region, 1970 to 2000

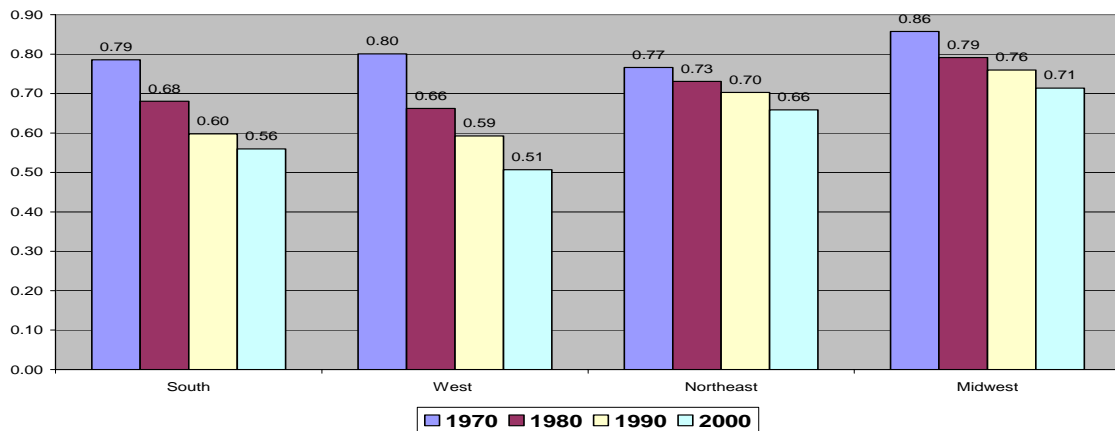


Table 1
Fixed Effect Estimates of Proportions of MA Racial Poverty Group Resident in Neighborhoods of Large Metropolitan Areas: 1980-2000 by Region

	Northeast				Midwest				South				West			
	PAA	PnAA	nPAA	nPnAA	PAA	PnAA	nPAA	nPnAA	PAA	PnAA	nPAA	nPnAA	PAA	PnAA	nPAA	nPnAA
Opposite Poverty/Same Race																
proportion a decade prior	0.653 <i>68.34</i>	0.563 <i>38.87</i>	0.389 <i>67.24</i>	0.191 <i>39.19</i>	0.627 <i>65.5</i>	0.364 <i>25.45</i>	0.399 <i>63.83</i>	0.155 <i>23.13</i>	0.723 <i>70.20</i>	0.463 <i>37.69</i>	0.188 <i>24.56</i>	0.307 <i>35.65</i>	0.763 <i>80.29</i>	0.398 <i>32.86</i>	0.445 <i>89.42</i>	0.225 <i>35.21</i>
change in proportion for prior decade	-0.064 <i>-5.25</i>	0.453 <i>28.86</i>	0.272 <i>58.13</i>	-0.054 <i>-15.45</i>	0.398 <i>34.94</i>	0.222 <i>14.58</i>	0.310 <i>49.07</i>	-0.036 <i>-8.12</i>	-0.054 <i>-3.51</i>	0.308 <i>23.68</i>	0.081 <i>20.42</i>	-0.066 <i>-11.35</i>	0.437 <i>34.77</i>	0.266 <i>20.74</i>	0.291 <i>57.58</i>	-0.087 <i>-18.36</i>
Opposite Race/Same Poverty																
proportion a decade prior	0.095 <i>5.46</i>	0.003 <i>0.58</i>	-0.011 <i>-0.58</i>	-0.018 <i>-5.08</i>	0.159 <i>7.11</i>	-0.021 <i>-4.35</i>	0.053 <i>2.23</i>	-0.018 <i>-5.01</i>	0.069 <i>2.96</i>	0.033 <i>6.62</i>	0.414 <i>16.40</i>	0.039 <i>8.49</i>	0.536 <i>18.44</i>	0.067 <i>19.87</i>	0.798 <i>31.21</i>	0.070 <i>24.92</i>
change in proportion for prior decade	-0.064 <i>-5.25</i>	0.010 <i>2.39</i>	-0.083 <i>-4.26</i>	0.001 <i>0.25</i>	-0.199 <i>-13.30</i>	-0.004 <i>-0.83</i>	-0.154 <i>-6.29</i>	0.008 <i>2.19</i>	-0.054 <i>-3.51</i>	0.002 <i>0.74</i>	0.216 <i>8.61</i>	0.079 <i>16.61</i>	-0.129 <i>-6.01</i>	0.048 <i>17.16</i>	0.597 <i>23.10</i>	0.094 <i>31.62</i>
Opposite Race and Poverty																
proportion a decade prior	-0.191 <i>-7.22</i>	0.020 <i>3.01</i>	0.098 <i>7.99</i>	-0.016 <i>-5.33</i>	-0.279 <i>-9.34</i>	0.021 <i>3.71</i>	0.135 <i>7.58</i>	-0.022 <i>-7.26</i>	-0.170 <i>-6.38</i>	0.020 <i>3.56</i>	0.043 <i>1.89</i>	-0.012 <i>-3.15</i>	-0.573 <i>-15.34</i>	-0.031 <i>-7.32</i>	-0.187 <i>-9.12</i>	-0.037 <i>-16.22</i>
change in proportion for prior decade	-0.141 <i>-5.12</i>	0.046 <i>7.10</i>	-0.049 <i>-5.75</i>	-0.016 <i>-6.92</i>	-0.197 <i>-6.41</i>	0.021 <i>3.59</i>	-0.085 <i>-7.07</i>	-0.025 <i>-8.97</i>	-0.059 <i>-2.25</i>	0.035 <i>5.79</i>	0.060 <i>4.04</i>	-0.003 <i>-1.63</i>	-0.302 <i>-7.95</i>	-0.010 <i>-2.24</i>	0.116 <i>7.69</i>	-0.022 <i>-11.37</i>
Changing Tract Characteristics																
initial population density x 100,000	-0.002 <i>-2.79</i>	0.000 <i>2.41</i>	0.000 <i>0.10</i>	0.000 <i>1.42</i>	0.002 <i>2.83</i>	0.001 <i>5.74</i>	0.009 <i>2.43</i>	0.013 <i>8.19</i>	0.003 <i>1.61</i>	0.047 <i>4.67</i>	0.229 <i>12.18</i>	-0.012 <i>-1.47</i>	0.002 <i>0.20</i>	0.002 <i>0.80</i>	0.005 <i>0.99</i>	0.004 <i>2.11</i>
initial Hispanic representation x 100	-0.013 <i>-1.52</i>	0.026 <i>5.39</i>	0.007 <i>1.20</i>	-0.004 <i>-1.51</i>	0.035 <i>1.45</i>	0.050 <i>4.24</i>	0.031 <i>1.68</i>	-0.021 <i>-2.86</i>	-0.025 <i>-0.79</i>	0.268 <i>1.64</i>	-0.109 <i>-3.51</i>	-0.031 <i>-2.37</i>	-0.052 <i>-2.90</i>	0.035 <i>5.70</i>	-0.023 <i>-1.83</i>	-0.026 <i>-6.37</i>
ave household income as % of MSA ave x 1,000	0.033 <i>1.34</i>	0.095 <i>-6.75</i>	0.013 <i>0.76</i>	0.183 <i>26.05</i>	0.058 <i>1.26</i>	-0.100 <i>-4.01</i>	-0.035 <i>-0.89</i>	0.370 <i>25.58</i>	-0.044 <i>-0.56</i>	-0.341 <i>-8.57</i>	-0.143 <i>-1.89</i>	0.874 <i>29.17</i>	0.001 <i>0.10</i>	-0.11 <i>-5.67</i>	-0.039 <i>-0.99</i>	0.277 <i>21.18</i>
within tract r-squared	0.23	0.09	0.22	0.13	0.30	0.06	0.27	0.12	0.36	0.16	0.14	0.22	0.38	0.10	0.38	0.17

Table 2				
Means (and Standard Deviations) of Variables Used in Fixed Effect Analyses				
	Northeast	Midwest	South	West
Initial proportion of race-income group				
mean value	0.0007	0.0013	0.0025	0.0011
standard deviations				
PAA	0.0025	0.0048	0.0076	0.0058
PnAA	0.0010	0.0018	0.0031	0.0018
nPAA	0.0020	0.0039	0.0067	0.0048
nPnAA	0.0008	0.0013	0.0024	0.0013
Changes in proportions over decade				
PAA	-1.36E-06	-4.15E-04	-2.93E-04	-4.48E-06
PnAA	-1.82E-12	2.32E-12	1.67E-12	7.00E-13
nPAA	-1.63E-07	-9.63E-07	-6.75E-06	-1.85E-07
nPnAA	-1.66E-07	-2.70E-06	-2.43E-07	-9.89E-08
Tract characteristics				
Population density	16584	6352	3173	6336
Hispanic representation	0.072	0.036	0.113	0.170