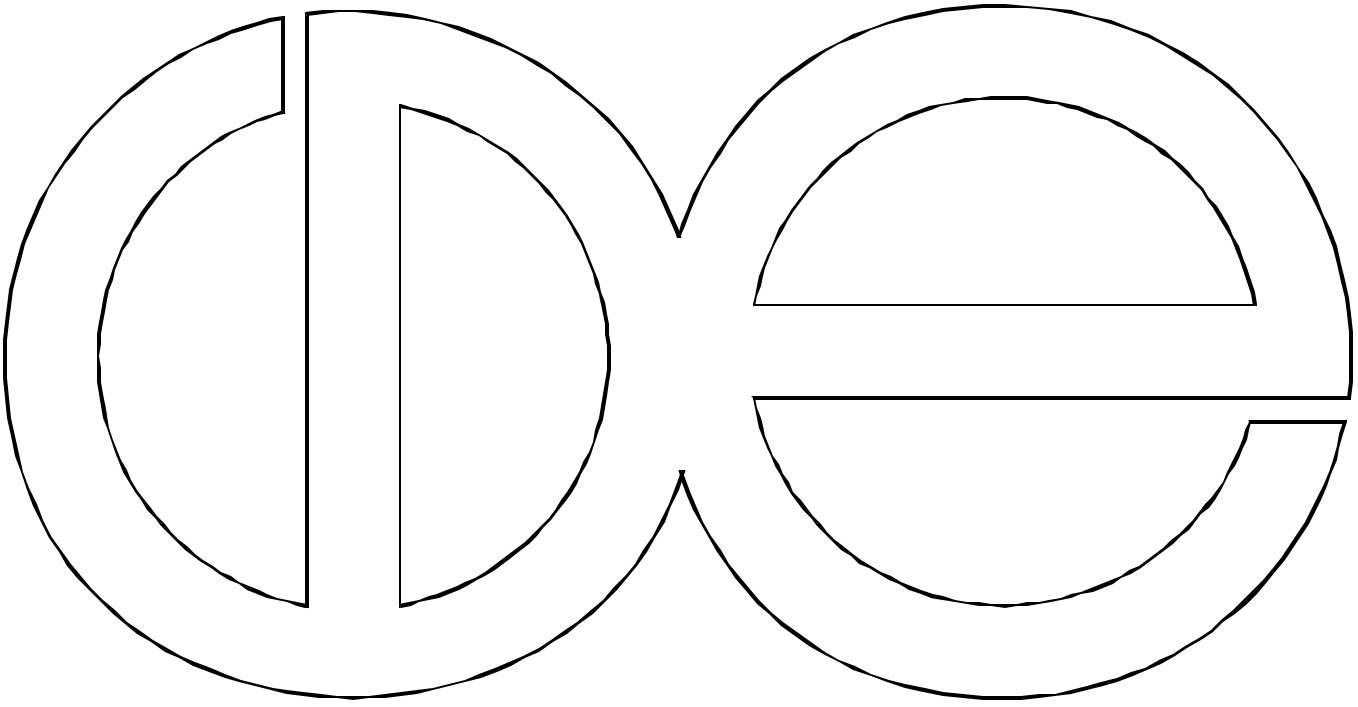
Center for Demography and Ecology

University of Wisconsin-Madison

Migration and the Maintenance of Racial Segregation

Lincoln Quillian

CDE Working Paper No. 98-29



MIGRATION AND THE MAINTENANCE OF RACIAL SEGREGATION[1]

Word Count: 10,542

July 1999

Lincoln Quillian

Department of Sociology
University of Wisconsin–Madison

[1] Direct correspondence to Lincoln Quillian, Department of Sociology, The University of Wisconsin–Madison, 1180 Observatory Drive, Madison, Wisconsin, 53706 (E-mail: quillian@ssc.wisc.edu). I have benefitted from comments from Franklin Wilson, Devah Pager, Mitchell Duneier, and members of the race and ethnic brownbag at the University of Wisconsin–Madison.

MIGRATION AND THE MAINTENANCE OF RACIAL SEGREGATION

Abstract

This paper examines the patterns of residential mobility by whites and African Americans that contribute to continued high levels of black/white residential segregation in American cities. Using data from the Panel Study of Income Dynamics matched with data from the decennial censuses, patterns of migration are described and then modeled as a function of individual characteristics. Three patterns are found to be primarily responsible for continuing high levels of segregation: white avoidance of neighborhoods with more than a few blacks, low rates of black entry into white neighborhoods relative to whites, and black migration out of white neighborhoods. White probabilities of moving among neighborhood types are only weakly influenced by individual characteristics including income; black probabilities are more strongly influenced by individual characteristics. The results indicate that white migration to avoid neighborhoods with more than a small black presence is a key process that upholds racial segregation. Implications for policies to address racial segregation are discussed.

MIGRATION AND THE MAINTENANCE OF RACIAL SEGREGATION

Despite a decline in levels of residential racial segregation in the past few decades, whites and African Americans remain extremely spatially separated from one another (Massey and Denton 1993; Farley and Frey 1994). Black/white segregation in the late twentieth century demonstrates more continuity than change. This continuity is particularly remarkable because Americans move so often. Nearly one in six American families move every year (U.S. Bureau of the Census 1998). With such a high rate of relocation, if African Americans and whites were to begin to move in patterns unrelated to race, segregation would decline rapidly. Segregation is constantly recreated through the process by which families resettle.

While segregation has been persistent, the process that maintains segregation need not have remained unchanged. Residential racial segregation can be maintained by many patterns of movement. Racially homogeneous neighborhoods could result because blacks almost never move into white neighborhoods and whites almost never move into black neighborhoods. Or segregation could be the result of blacks moving into white neighborhoods with some regularity, but moving out after only short stays.

This paper examines patterns of movement among neighborhoods characterized by their racial makeup using longitudinal data. The primary goal of the analysis is to describe how segregation is recreated through the process of migration among neighborhoods, and to consider implications of this process for the causes of segregation. The results support the conclusion that white migration to avoid neighborhoods with more than a small African American presence is a key process that upholds racial

segregation.

PAST THEORY AND RESEARCH

Few social phenomena have been as thoroughly measured as racial residential segregation. Studies have documented the extent of racial segregation (e.g., Taeuber and Taeuber 1965; Massey and Denton 1993), considered measurement issues at length (e.g., White 1986; Massey and Denton 1988), and charted changes in the extent of segregation over time (e.g., Farley and Frey 1994; Cutler, Glaeser, and Vigdor 1999). Compared to the large body of research on the extent of segregation, however, relatively little research considers *why* segregation persists. Many studies broadly refer to racism, racial prejudice, or discrimination. While largely correct, broad references to discrimination are not very informative. To understand the sources of racial segregation, we need to address the specific questions of who is discriminating, why, and to what extent discrimination contributes to maintaining racially isolated neighborhoods.

Contemporary discussions of the causes of segregation usually cite one of three explanations (Myrdal 1944; Yinger 1995). Some authors emphasize the importance of white efforts to keep blacks out of their neighborhoods (Galster 1988; Massey and Denton 1993; Yinger 1995). Such barriers to entry include discrimination by real estate agents and landlords and violence directed at blacks who move into white neighborhoods. A second explanation stresses the desire of whites for neighborhoods that are predominately white, coupled with the desire of most blacks to live with at least some other black neighbors (Schelling 1971, 1972). The migration that results from these preferences, then,

maintains segregation at high levels. A third explanation emphasizes the importance of racial disparities in income or wealth coupled with neighborhood differences in housing prices (Clark 1986). Although not usually described as a sufficient factor to explain segregation in itself, racial differences in income are often thought to be a factor that contributes to segregation.

Barriers to Entry

Until at least 1970, there were massive and widespread efforts by whites to keep African Americans and other people of color out of their neighborhoods. Landlords, sellers, and brokers blocked the entry of African Americans into white neighborhoods using both legal and informal means. Displays of violence directed against pioneer African-American families discouraged African Americans from trying to enter white neighborhoods (Jackson 1985; Massey and Denton 1993).

Many of these practices were made illegal by court rulings and legislation following from the civil rights movement. White attitudes also changed (Schuman, Steeh, Bobo, and Krysan 1997), and this change probably reduced the extent of informal efforts to exclude blacks. Yet there is strong evidence that informal discriminatory practices continue. Audit studies employing matched pairs of black and white "testers" who attempt to rent apartments or buy houses demonstrate that subtle discrimination by real estate agents and sellers is common (see Yinger [1995] for a review). Statistical studies likewise show strong evidence of discrimination in mortgage lending (Yinger 1995, ch 5).[2]

[2] Discrimination by real estate agents may reflect the fear of agents that local white residents will boycott their services if they help black families move into their neighborhoods (Yinger 1986). Discrimination by housing market agents, then, may be caused by the preferences of white residents. Nevertheless, discrimination by real estate agents and preferences of white neighborhood residents are two different mechanisms of segregation with separable effects, and as I discuss in the policy section it is crucial we distinguish these effects to understand

Although violence against African Americans is far less frequent than it once was, there are still violent racist incidents directed at black families who move into white neighborhoods (Massey and Denton 1993, chapter 3). Several prominent scholars on segregation, mostly notably Douglas Massey and Nancy Denton (1993), have argued that these factors are crucial in upholding contemporary racial segregation. Their argument is that racial discrimination in housing acts as a barrier to the entry of all but a few white neighborhoods by African Americans: "whites can only avoid co-residence with blacks if mechanisms exist to keep blacks out of most white neighborhoods" (p. 97). Without housing discrimination, they reason, there would be almost no all-white neighborhoods for whites looking to avoid black neighbors.

This argument is plausible but hardly conclusive. Even if there were no barriers to entry of white neighborhoods by African Americans, it is unclear that African Americans would disperse among white neighborhoods in a pattern so as to eliminate nearly all-white neighborhoods. Given that there are about seven white people in the United States for every black person, ending overwhelmingly white neighborhoods would require a spreading out of the black population in low concentrations. Many African American families may not want to live in such racially isolated environments.

The importance of housing discrimination for segregation is ultimately an empirical question. Empirical research on housing discrimination includes both audit studies and efforts to relate discrimination to levels of segregation using statistical models. Both lines of research suggests that segregation probably contributes to segregation, but research has not established the extent of this

---

proposed policies to deal with racial segregation.

contribution.

The audit studies provide strong evidence of discrimination in housing markets, but little information about the extent to which discrimination by market agents translates into residential racial segregation. If African-Americans strongly prefer white neighborhoods, and are willing to invest extra time, energy, and money in their housing search, they are likely to encounter some Realtors who do not discriminate and ultimately take up residence in a predominately white neighborhood. These audit results imply that the additional search costs for African American families to move into white areas are fairly substantial, but they do not tell us the number of African American families that are deterred because of these difficulties.

Several studies by Galster (1986, 1987, 1991; Galster and Keeney 1988) and one by South and Crowder (1998a) attempt to directly address the extent to which discrimination contributes to segregation. Both studies rely on data on metropolitan area levels of housing discrimination from housing audit studies. Galster shows that cities with high levels of discrimination tend to be more segregated than cities with low levels of discrimination. But the results vary sharply with different model specifications and the association is never extremely strong. Taking Galster's statistical models at face value, the elimination of housing discrimination would result in between a 0% to 40% reduction in segregation.[3] Galster's results suggest that eliminating racial discrimination by Realtors and lenders would cause some reduction in housing segregation, but not that it would eliminate racial segregation completely. South and Crowder (1998a), in contrast, find that African Americans are actually *more*

[3] Galster (1987, 1991) and Galster and Keeney (1988) use an elaborate simultaneous equation model. Model instability and strong assumptions necessary to identify these models make their estimates problematic. Galster (1991) acknowledges many of these problems and calls these efforts "preliminary."

likely to move into white neighborhoods in cities with higher rates of discrimination. They find no support for housing discrimination as a barrier to African American entry to white neighborhoods.

Although evidence strongly supports the continued existence of barriers to entry of white neighborhoods, evidence about their importance is inconclusive. Barriers to entry probably contribute to segregation, but their extent of their contribution remains to be determined.

Preferences and Mobility

A second mechanism that can potentially generate segregation is selective migration to neighborhoods with a racial composition movers would prefer, or at least would be willing to tolerate. Since persons vary in their preferred neighborhood racial composition, we can consider preferences or tolerance as having a distribution. Efforts to map the neighborhood racial preference distributions have relied mostly on survey questions about hypothetical neighborhoods. Respondents are shown diagrams of neighborhoods of different racial makeup and asked which neighborhoods they would prefer and which they would be willing to tolerate (e.g., Farley et al. 1978; Farley et al. 1994; Zubrinsky and Bobo 1996).[4] Tabulating the responses gives an idea of the neighborhood racial preference distribution.

These studies have found that whites strongly prefer neighborhoods which are less than 50% black, and most whites prefer neighborhoods that are less than 30% black (Clark 1991).[5] African

[4] Whites appear more tolerant when asked about racial mixes under which they would likely move out than mixtures under which they were likely to move in (Farley et al. 1978; Farley et al. 1994; Zubrinsky and Bobo 1996). Whites appear even less tolerant when asked what type of neighborhood they would "prefer" (as in Clark 1991). Although in the text I refer to question asking for "preferred" racial composition, the same basic conclusions follow from white responses to these other survey questions.

[5] White preferences stated on surveys are probably an upper bound on the white tolerance distribution, because whites may bias their answers toward tolerant responses so as not to appear racist to interviewers (Harris

Americans (and most other minorities), on the other hand, strongly prefer neighborhoods that are 50% black (or 50% minority for most other minority groups). Both whites and African Americans express some preference to live in neighborhoods with members of their own group, but most whites express a preference for being in the majority, while most African Americans prefer racially balanced neighborhoods.

These preferences may be motivated both by desire for a sense of ethnic community as well as by the desire to avoid coresidence with other racial groups. Desires for a sense of ethnic community have most often been invoked to explain the preferences of minority races to live with other minorities.[6] The greater ease of social interaction and sense of community that can accompany racially homogeneous communities are benefits that some may seek out (Wilson and Hammer 1998). Avoidance, on the other hand, reflects an active effort to avoid members of another racial or ethnic group because of their perceived negative qualities. The fact that white own-group preference is stronger than that of other racial groups suggests that white preference are motivated at least partly by avoidance. White avoidance desires may be the result of raw racial prejudice or stereotypes (Schuman and Bobo 1988; Farley et al. 1994), or could be because whites assume that African American neighborhoods are accompanied by other social problems rather than because they dislike African American neighbors *per se* (Harris 1999).

A discussions of preferences would be incomplete without considering their relationship to

---

1999).

[6] Some authors have taken this position to an extreme, essentially arguing that all racial segregation results from preferences of minority group members to live with their own group (Banfield 1970). Yet a long line of research, beginning with Lieberson (1963), has disproved this claim.

neighborhood segregation. Important work by Schelling (1971, 1972) develops a model relating the two. Schelling assumes that each white household has a tolerance threshold for blacks in the neighborhood; if the share of blacks in the neighborhood exceeds their tolerance threshold the family will move out. Schelling shows that, under certain distributions of preferences, a single black movement into a white neighborhood can lead to a cascade in which a white family moves out, followed by another black family moving in that causes another white family to move out, and so on.[7] The implication of this model is that even if most whites are tolerant of a few black neighbors and most blacks are tolerant of many white neighbors, these preferences can lead to highly segregated neighborhoods.

Schelling's model is particularly plausible because the distribution of preferences that leads to segregated neighborhoods is close to the distribution of preferences observed from tabulating survey responses (Farley et al. 1978; Clark 1991). Migration following these preferences is likely to result in higher levels of segregation than the average white or African American person wants. Even in the absence of other segregating forces, Schelling's work suggests that migration alone can create high levels of segregation.

Economic Differences

A final theory is that racial segregation results from racial differences in income or wealth. Dwellings of similar price tend to be clustered together residentially. Even if there were no other forces causing

[7] Racial succession can also result if whites refuse to move in to neighborhoods over their threshold for tolerance of blacks in the neighborhood, even if they are not especially likely to move out of black tracts (Schelling 1971).

racial segregation, racial differences in wealth and income should lead to some racial segregation.

Taeuber's (1975) summary of the economic explanation still holds true today: "The argument has some truth, but less than is commonly supposed" (p. 836). Some studies find that high income blacks are no more likely to have white neighborhoods than low income blacks (e.g., Massey 1979; Denton and Massey 1988), while other studies find a positive association between black income and white neighborhood environments (e.g., Villemez 1980; Alba and Logan 1993). Yet both lines of research agree that only a small share of total segregation can be explained by racial differences in income (Duncan and Duncan 1953; Taeuber and Taeuber 1965; Farley 1977; Massey 1979; Denton and Massey 1988; Logan, Alba, McNulty, and Fisher 1996). Although there are some limitations to these studies,[8] the preponderance of evidence suggests that racial economic disparities can explain only a fairly small share of the total observed degree of racial segregation. African Americans and whites who earn the same amount usually live in neighborhoods with very different racial makeups.

Implications for Neighborhood Mobility Patterns

All of these explanations are plausible, and evidence suggests that each explanation probably contributes at least a little to segregation. What is their relative importance in maintaining racial segregation? I consider this question through an analysis of patterns of mobility. Because my data describes movement but not the motives for moving, there are limitations to this approach, and I do not

[8] In particular these studies do not include measures of wealth, instead relying on variables like income, education, and occupation (Clark 1986). This may lead to some underestimation of the role of economic differences in explaining racial segregation because wealth may be more important than income in determining the ability of residents to buy houses, and because there are larger racial disparities in wealth than in income (Oliver and Shapiro 1997).

provide a definitive "test" of these theories. Yet combined with findings of prior research this allows some assessment of the relative importance of these theories for explaining segregation.

Discriminatory practices by real estate agents, lenders, and sellers function as a means of boundary maintenance which excludes African Americans from white neighborhoods.[9] Likewise, the threat of violence or harassment by whites may also act as a barrier to entry by African Americans. To the extent that such barriers to entry are of overwhelming importance, we should rarely observe African Americans moving into white neighborhoods. Low rates of entry into white neighborhoods may also reflect other factors, such as a desire for ethnic community. High rates of mobility into white neighborhoods, however, provide reason to doubt the importance of housing market discrimination.

If segregation is the result of a white desire to avoid contact with African American neighbors, we should observe two patterns. First, whites should rarely move into black neighborhoods. Second, African Americans in white and racially mixed neighborhoods should often have their neighborhoods become blacker around them as whites move out.

Finally, if racial differences in income are the basis of segregation then African Americans and whites with equal levels of income should have fairly similar patterns of mobility.

---

[9] This also applies to discriminatory placement of public housing facilities or other public facilities placed so as to contain a black population in a particular area (Massey and Kanaiaupuni 1993).

Prior studies of mobility patterns

Two prior studies have used the Panel Study of Income Dynamics to examine facets of mobility patterns among neighborhoods classified by race. Massey, Gross, and Shibuya (1994) examine patterns of mobility among neighborhoods classified by their neighborhood type and poverty status. South and Crowder (1998b) investigate the determinants of moving among neighborhood types. Why do we need a new analysis of mobility patterns?

Massey, Gross, and Shibuya's (1994) study is concerned with how racial segregation contributes to the existence of high-poverty neighborhoods, in particular the relative importance of racial segregation as opposed to class-specific migration. Although it is possible to examine their tables for patterns of migration that may be relevant to the causes and nature of racial segregation, their article only very briefly mentions migration patterns that contribute to segregation. Further, because Massey, Gross, and Shibuya's analysis has a different goal, in several respects their results are not well suited to answering questions about the causes of racial segregation. For instance, they exclude moves between metropolitan and non-metropolitan areas, although these may contribute to segregation. Likewise, they consider a move "out" of a white neighborhood as any move out of a white census tract, even if that move takes the respondent to another white census tract. They do not calculate the overall probability that a white respondent will move from a black to a white neighborhood in a single year. But this is the statistic most relevant for assessing the rate at which whites are fleeing black neighborhoods.

South and Crowder (1998b) examine patterns of movement among neighborhoods classified by their racial makeup. Both their sample selection and modeling strategy, however, make it difficult to draw conclusions about racial mobility patterns overall.

South and Crowder's sample includes only heads of households and persons who stayed in the same metropolitan area each person-year. These restrictions make their sample unrepresentative of the total population of blacks and whites. Because single people move more frequently than larger households, limiting the sample to households will lead to overestimates of the rate at which *people* move among neighborhoods.[10] Likewise, limiting the sample to only persons who resided in the same metropolitan area excludes a potentially important part of the total flows of persons that lead to neighborhood segregation. As a result, their sample is not comparable to the census population totals used to calculate segregation indexes in cross-sectional studies.

South and Crowder also model the probability of moves among neighborhood types. Two features of South and Crowder's (1998b) models, however, make it impossible to assess the influence of income in accounting for racial differences in mobility. First, racial differences in patterns of movement are a function both of effects on mobility and the extent of racial differences on these attributes. South and Crowder estimate magnitudes of effects, but they do not couple these with an analysis of how racial differences in attributes explain racial differences in mobility.[11] Second, South and Crowder include several variables that can be seen as intervening variables between income and migration. For instance, South and Crowder's models control for renter/owner status.[12] Yet income

---

[10] It will correctly estimate the rate at which households move among neighborhood types, but we are interested in generalizing to persons, not households.

[11] South and Crowder find that race remains a significant predictor with these other variables controlled, but there is no way to tell how much of the race effect is accounted for by each of the independent variables in their models.

[12] Another variable that South and Crowder control for that is likely to mediate between income and mobility is "persons per room." High income families probably are less likely to live in crowded conditions.

probably influences renter/owner status, and renter/owner status influences the probability of moving, making it an intervening variable between income and relocation decisions. Because they estimate the effect of income with renter/owner status controlled, it is impossible to assess the overall impact of income on mobility from their study.[13] The overall effect, however, is what is of interest to assess the extent to which a racial difference in income explains differences in mobility patterns. Their results are informative about the partial effects of several variables on mobility, and this emphasis may be appropriate for examining the three perspectives on "locational attainments of racial and ethnic groups" they consider. Their results, however, leave unanswered many questions about the factors responsible for racial differences in mobility patterns.

Although I perform analyses that differ from Massey, Gross, and Shibuya (1994) or South and Crowder (1998b) in several ways, at some point our analyses and findings overlap. The most distinctive feature of this paper relative to these two articles is in the use that is made of the results. The implication of their results for the three major theories of the causes of segregation, discussed above, is not considered by either article. Yet, as I shall argue, assessing the relative importance of these three theories is very important for policies to counter neighborhood racial segregation.

DATA

The individual data in my study comes from the Panel Study of Income Dynamics, a large national

[13] For a discussion of why it does not make sense to control for an independent variable that is at least partly a consequence of a key independent variable, see King, Keohane, and Verba (1994, pp. 173-175).

survey which has followed approximately 5000 families and their descendants with yearly interviews since 1968. Linked neighborhood data comes from the PSID census geocode abstract from census data on tracts.[14] Because the PSID address tapes for 1969, 1975, 1977 and 1978 have not been matched to 1970 or 1980 census data I use PSID data from 1979-1990 only. The PSID sample originally included an over sample of poor families; I employ the PSID case weights for all analyses in this paper to make the results representative of the U.S. population. Since the PSID sample before 1990 has very few Latinos or Asians, I examine African American and white PSID sample members only.

I classify neighborhoods into four racial tract types: white (less than 10% of population black), predominately white (10-30% of the population black), racially mixed (30%-70% black), and black (70% -100% black).[15] This categorization loosely follows the work on preferences for neighborhoods based on their racial composition in Clark (1991). Neighborhoods that are less than 10% black are unlikely to have begun a process of racial transition by which white populations tend to decline and black populations to increase. Neighborhoods which are 10-30% black are those in which neighborhood racial transition may be underway but where, according to surveys of preferred neighborhood racial composition, many whites would still find black presence tolerable. The 30-70% black neighborhoods include neighborhoods in which the large majority of African Americans say that they would prefer to live. Few whites would want to live in neighborhoods with this racial mix. Finally,

[14] Census tracts are basic small area units which average 4000 persons. For a discussion of how tract boundaries are drawn and their advantages and disadvantages as neighborhoods, see Appendix B of White (1987).

[15] For the breakdown of the PSID sample among these neighborhood types, see Appendix Table 1.

I include a category for neighborhoods that are predominately black (70% +), which almost all whites would prefer to avoid.

These neighborhood types are defined based on percent black only. Because of the low representation of PSID respondents in highly multiethnic tracts, it would be difficult to conduct an analysis of migration through multiethnic tracts with the PSID data. Because whites and blacks are more segregated from each other than from other racial groups (Frey and Farley 1996), defining neighborhood types based on percentage nonwhite would result in more whites and blacks in the intermediate ("integrated") neighborhood, and would reduce the apparent extent of racial differences in mobility patterns.

Two other neighborhood types serve as residual categories. Non-metropolitan residents are in a non-metropolitan (rural) category. Respondents who live in urban areas but for which no census tract ID is available are in a non-tract metropolitan category.[16] Appendix table 1 shows the distribution of person years across the neighborhood types by race.

Because census data on neighborhood characteristics is only available at 10 year intervals, intercensal neighborhood characteristics are filled in using linear interpolation between census years. For instance, tract percentage black for 1982 would be based on linear interpolation of the percentage

[16] Two other options that could be employed to deal with cases which do not have tract addresses are complete exclusion and assignment of tract characteristics based on other small area units. Complete exclusion makes it difficult to assess the extent to which bias might arise from eliminating these cases. A separate category for non-tract units does not resolve this problem, but it does allow assessment of the likely severity of the problem by examining how many cases lack tract identifiers and if they appear to have systematically different patterns of migration. A second possibility is to assign many of these respondents their neighborhood percentage black based on another census geography unit, such as minor civil division or enumeration district. Such non-tract units tend to be less racially segregated than tract units, both because the boundaries are not drawn with respect to population characteristics and because these units are usually larger than typical tracts. Their larger size will tend to lead them to be less segregated than tracts.

black between 1980 and 1990. This method excludes interpolation for tracts whose boundaries changed.

Inferential statistics

The PSID sample was initially drawn using a stratified and clustered design, and so is not a simple random sample (Hill 1992). Further, the person years used as cases often include multiple transitions for a single individual and multiple observations on persons within the same family. This does not bias conditional probability estimates, but it does imply that the observations are not independent and makes standard error formulas based on simple random sampling inappropriate.

To deal with this problem I use variables identifying stratum and sampling error computation units in the PSID to compute corrected standard errors using the Taylor series linearization method (Kalton 1979). The estimates do not make any assumptions about the structure of the errors within the clusters.[17] Since all the person-years of a particular individual and of their family members are within the same cluster, this method accounts for the clustering caused by multiple observations on individuals and family members.

RESULTS

[17] This was done using the svy commands in the statistical package Stata (StataCorp 1997a). Because these estimates make no assumption about correlations among observations within the first stage probability sampling units (and thus do not use information about randomness introduced into the design by sampling at later stages) they probably are slightly upwardly biased. In a sense these estimators take the approach that the only randomness in the sample is introduced by stratum/PSU selection (see StataCorp 1997b section 36.2.1).

My basic procedure is to examine probabilities of moving among neighborhoods classified by their racial makeup. I use a multivariate model to assess the extent to which racial differences in income and other variables may explain racial differences in transition probabilities. The stable population corresponding to the transition matrices are used to assess the implications of the matrices for levels of segregation.

Moving out

Table 1 shows probabilities of moving out of the four neighborhood types within a one year span. The probabilities are broken down into four components, with the overall probability of exiting in the fifth column. The first column gives the estimated probability a respondent who lives in that tract type will move from their current census tract, regardless of destination of the move. For instance, there is an estimated .108 probability that a white respondent living in a white (less than 10% black) census tract will move to another type of tract.[18] Many of these moves will be to another white census tract. Column 2 gives the probability that a respondent who changed tracts will move to a tract type other than their current tract type. The probability that a white person in a white census tract will move to another tract type is small, only .331. Of moves to different census tracts by white respondents in white tracts, 66.9% were to other white tracts.

Column 3 displays the probability that a respondent will exit a tract each year by moving (which is distinct from Column 2 because here we are *not* conditioning on having moved). Likewise, column 4

[18] Here, as elsewhere in this paper, I only consider respondents to have moved if they switched census tracts. My data does not allow me to distinguish when respondents might have moved to dwellings within the same census tract.

gives the overall probability that a respondent will exit a census tract because the census tract changes type around that respondent.[19] The total probability of exiting a census tract type is the sum of columns 3 and 4, shown in column 5.

What do the probabilities in table 1 suggest about the patterns of movement that lead to racial segregation in American cities? Two patterns from the table are especially relevant.

First, examining the top panel for white PSID respondents, we can see that as the percentage of blacks in the neighborhood type increases the probability of moving to a new census tract increases (column 1). The probability of switching types, if moving, increases by an even greater amount if resident in a black neighborhood (column 2). This is indicative of substantial white flight from neighborhoods with more than a few African American residents. Overall whites are 3 to 4 times more likely to move out of neighborhoods with 10% or more black residents than they are neighborhoods that have 10% or fewer black residents (column 3). Whites move out of tracts with more than 10% of their population black at a very rapid pace.

The probabilities for African Americans are in the lower half of the table. In contrast to whites, African Americans are most likely to switch census tracts when they live in predominately white census tracts (column 1). When African Americans switch census tracts (column 2), they are most likely to exit their current tract type when they live in a white tract, and the probability of exiting is especially low when they live in a predominately black census tract. South and Crowder (1998b) also found this to be true. The probability an African American will exit their tract decreases monotonically as the

---

[19] This is the product of the probability of staying (one minus column 1) and the probability a stayer will move out of the census tract type (not shown).

proportion of the tract that is black increases (column 3). This pattern is strong: African Americans in white neighborhoods are about five times more likely to exit the tract type than African Americans in black neighborhoods. African Americans living in white neighborhoods often move to blacker neighborhoods, even though these neighborhoods tend to be less affluent. Instead, moves from predominately white to predominately black neighborhoods are fairly common.

Column 4 gives probabilities of exiting a neighborhood type because that neighobrhood changed type around the respondent. Contrasting the white (upper) and African American (lower) panels, African Americans in non-black neighborhoods are roughly 3 to 4 times more likely to have their neighborhoods change in type around them than whites are. Whites are much more likely to live in racially stable tracts than African Americans.

When the effects of movement and neighborhood change are combined (column 5), the white and black exit probabilities are near mirror images of one another. Whites are about five times more likely to exit tract types other than white than they are to exit white (less than 10% black) tracts. African Americans, on the other hand, are about three times more likely to exit tract types other than black (70% or more black) than to exit black tracts.

Movement in

The results in table 1 characterize probabilities of exiting tracts, but do not characterize destinations. Destinations are considered in tables 2 and 3. Each of these tables shows transition matrices. The transition matrix has the origin neighborhood type on one axis and the destination neighborhood type on the other. Suppose there are k neighborhood types (for most tables in this study, k=6), then we can

write the transition matrix, **P**, as

$$\boldsymbol{P} = \begin{matrix} p_{11} & p_{12} & \cdots & p_{1k} \\ p_{21} & p_{22} & \cdots & p_{2k} \\ \vdots & \vdots & & \vdots \\ p_{k1} & p_{k2} & \cdots & p_{kk} \end{matrix}$$

$$\sum_{j=1}^{k} p_{ij} = 1$$

The cell entries, p_{ij}, are the probabilities that a family who lives in a neighborhood corresponding to row i at time t will end up in neighborhood type corresponding to column j at time t+1. Each row of the transition matrix sums to one, since everyone ends up in one of the neighborhood types.

Table 2 shows the transition matrix for movers only (respondents who switch census tracts) and table 3 shows the transition matrix for stayers only (respondents who did not switch census tracts). The overall transition matrix, combining movers and stayers, is shown in appendix table 2.

Beginning with the upper panel of table 2 (whites), what clearly stands out is the dominance of white (less than 10% black) census tracts as a destination for moves regardless of the origin census tract racial makeup. Massey, Gross, and Shibuya (1994) also note this pattern. Moves by whites are more likely to end up in a white census tract than to any other census tract type, even if the mover begins in a heavily African American census tract. The other pattern that stands out is that whites almost never move to census tracts that are more African American than their current tract type. The numbers in the table above and to the right of the diagonal are usually quite close to zero; while the numbers to the lower left of the diagonal are usually greater than zero. The table is asymmetric: whites

move to destinations that are whiter than their origin, and are by far most likely to move to the whitest possible destinations. This is consistent with concerted efforts by whites to avoid black neighbors.[20]

The lower panel for African Americans is much different. The probabilities above the diagonal are generally larger than those below, which implies that African Americans are more likely to move to African American neighborhoods than to white ones. But African Americans do move into white neighborhoods sometimes; the tendency to move into predominately white neighborhoods is not extremely weak. Depending on the origin tract type, the probability that a move will end up in a neighborhood with less than 10% of its population black is between .053 and .222; the probability a move will end up in a neighborhood with 10-30% of its population black is between .095 and .231. While African Americans do not move into white neighborhoods nearly as often as whites do, it is clear that African-American respondents in the PSID have non-negligible probabilities of moving into white neighborhoods. About 10% of all moves by African Americans end up in a white (less than 10% black) census tract. Whatever the effect of housing discrimination on the part of Realtors and landlords, it has not prevented occasional moves of African Americans into white neighborhoods.

---

[20] The numbers in table 2 do not adjust for the marginal distribution of neighborhood types (the marginal distributions by race can be found in appendix table 1). In fact the marginal distribution of neighborhood types is itself a product of the past pattern of movement, which is closely related to the current transition matrix. The fact that most neighborhoods are almost all white reflects both the fact that there are more whites than any other single racial groups in the United States and the reality of racial segregation. Fully standardizing for the marginals would standardize out the existence of racial segregation, which is what I am trying to explain.

One possible marginal distribution to consider a baseline model is the distribution assuming persons are assigned randomly to neighborhoods of a fixed size. This is the model of complete integration other than segregation resulting from purely random factors. A technique explained by Jargowsky and Ellwood (1990) in a different context can be used here to estimate this unsegregated marginal distribution, arising from the random assignment of persons to neighborhoods. In this case, the overwhelmingly large share of neighborhoods, more than 95%, would be in the "predominately white" (10-30% black) type.

Another possible marginal distribution to consider would be based on the metropolitan area percentage black, since metropolitan areas are often the area within which moves are chosen. This adjustment is considered in the next section.

Table 3 gives transition matrices for respondents who did not move. Since neighborhood change can only cause a census tract to change to an adjacent category in a single year, cells not adjacent to the diagonal necessarily have a zero probability and are shown as blank in the matrix.[21] Although in a few instances neighborhoods have their white share increase, for the most part change in neighborhoods around PSID respondents is in a single direction: toward blacker neighborhoods.

The neighborhood change results for African Americans further support the conclusion that white flight is a significant factor perpetuating segregation. Blacks are substantially more likely than whites to have their neighborhoods become blacker around them. If tracts were gaining in population, this could be accomplished by an increase in the black population of tracts while the white population held steady. But demographic research indicates that most urban census tracts have been falling in population density (White 1987). This suggests that these tracts are becoming blacker as their white population declines. Again, this is consistent with the importance of white migration to avoid neighborhoods with more than a few black residents.

Models of mobility patterns

To this point I have not considered the role of income, or other independent variables, in these mobility patterns. Past work and the initial findings suggest two questions. First, to what extent are racial differences in mobility patterns the result of racial differences in income or socioeconomic status? Second, to what extent do differences in mobility patterns reflect differences in the local area

[21] Even a neighborhood that changed from 0 percent black in 1980 to 100 percent black in 1990 would only change by 10% per year, thus changing at most by one category per year. This is an artifact of smoothing resulting from the linear interpolation procedure used to assign tract characteristics.

percentage black? A completely random intra-metropolitan move is more likely to end up in a black neighborhood in a city with many black residents than in a city with few black residents. Because the typical black respondent lives in a neighborhood with a higher proportion black than the typical white, this may explain some of the racial differences in movement probabilities.

I consider these questions by modeling the transition probabilities corresponding to the "full" matrix (the p_{ij}'s in appendix table 2) with multinomial logistic regression models (Agresti 1990). The model estimates the probability of being in each destination tract ($p_{.j}$) type based on tract type of origin (i) and the characteristics of the respondent:

$$\ln(p_{.j}/p_{.1}) = f_j + Dg_j + Xh_j + (DX)m_j$$

Where $p_{.j}/p_{.1}$ is the odds of living in the jth neighborhood (j = 2 ... 6) category at time t+1 relative to neighborhood type 1 (the reference category). The independent variables are D, an n by (k-1) vector of dummy variables indicating neighborhood type of residence at time t; X, an n by r vector of the r respondent characteristics; and DX, an n by ((k-1) * r) vector of the interaction of the dummy variables for neighborhood type of origin and the independent variables. The interaction terms allow the effect of each independent variable to differ depending on the origin neighborhood type.[22] The vectors of coefficients corresponding to these variables are g_j, h_j, and m_j, respectively; there is a separate vector of coefficients for each of the 5 contrasts (indexed by j). Because there are separate coefficients for each contrast and full interaction between the independent variables and neighborhood types, the

[22] Variables like age usually have a much different effect on residence in a particular tract if the respondent lives in tract than if they do not. The effect of other variables like income often differed depending on origin type even when limited only to respondents that switched tracts. South and Crowder (1998b) constrain the effect of the independent variables to be identical regardless of origin tract type.

coefficients of the model are voluminous and are not shown.[23]

The model includes several controls to reduce possible confounding influences of omitted variables. Included are variables that prior theory suggests are strongly related either to the probability of moving or to choice of destination: family income, head's education, age, age squared, two dummies for presence of children, three dummies for region, and percentage black in the metropolitan area. All variables are measured as of the origin time, except for percentage black in the metropolitan area which is measured at the destination. Other variables that are likely to mediate between income and mobility patterns, such as renter/owner status, are omitted to allow estimation of the total effect of income on mobility.[24]

The models are used to create predicted transition matrices, assigning white means to African Americans and African-American means to whites. To assess the implications of these matrices for levels of racial segregation, I compute the stable population matrix that corresponds to each of these predicted transition matrices. This last step is discussed at greater length below.

The effect of income and local area percentage black

Changes in the transition matrix predicted to result from a change from the white to the black mean are shown in tables 4 and 5. Table 4 is based on the white coefficients; table 5 is based on the African

---

[23] They are available from the author upon request.

[24] Omitted are variables that prior research does not show have *strong* effects on mobility probabilities, even if these variables have in some cases had statistically significant effects in prior research. Including such variables is as likely to worsen the quality of the estimates as improve them (Lieberson 1988) and conceptually makes the results more difficult to interpret.

American coefficients. The numbers shown in the table are the marginal effects, based on partial derivatives of the logistic regression coefficients. Corresponding logistic regression coefficients are in appendix tables 3 and 4. Only the effects of family income, head's education, and MSA percentage black are shown in the table, although all independent variables are included in the models.[25] The standard errors of forecast (estimated standard error of the predicted probability for all persons at the means of the covariates) are also shown.

The results for whites (table 4) show that changing from the black to the white mean on family income, head's education, and/or metropolitan area percent black has relatively little effect on the probabilities in the white transition matrix. Adjusting from the black to white mean does increase the chance of staying in racially mixed or black neighborhoods, as expected, but the effects are small. White probabilities of staying or entering a black neighborhood are relatively insensitive to the characteristics of white movers.[26]

Table 5 shows the marginal effects resulting from a change from the black to the white mean based on the black coefficients. Unlike the white coefficients, with the black coefficients these changes in the independent variables do have a significant effect on the transition probabilities. An increase in family income from the black to the white mean (an increase of about $15,000), increases the probability of a staying in a white tract by .062. An increase in income also increases the probability of

---

[25] Including the percentage black in the MSA variables necessitates excluding moves to and from non-metropolitan areas. I have also estimated marginal effects of models excluding the percentage black in the MSA variable, and the results change little. As a result there are only 5 neighborhood types (j = 2 ... 5) for models used to construct table 6.

[26] The effects for whites of the independent variables often appear much larger in terms of logits (appendix table 3). Because the base probability of a white person moving to any neighborhood type other than white is so small, a large change in the logit has little effect on the probability.

staying in a predominately African-American census tract, although only slightly. The other notable feature of the table is how little increased income translates into an increased probability of moving into a white destination tract. High income black families are much more likely to stay in a white tract than low income black families, but income has only a small effect on the chance an African American family will move into a white tract in the first place.

One reason income may increase the probability of staying in a white neighborhood is that more affluent black families are more able to afford a home in a white neighborhood. To consider this possibility, I also estimated models including renter/owner status as an independent variable (not shown). The effect of income is reduced by the inclusion of renter/owner status, but only by a small amount–most of the effect of income to increase the probability of staying in a white neighborhood is *not* because high-income blacks are more likely to be homeowners.

The metropolitan percentage black also has a substantial impact. Increases in the metropolitan percentage black increases the probability of staying and moving into a white neighborhood from racially mixed and predominately white neighborhoods. But the differences in the percentage black do not explain most of the racial difference in the entry probabilities. In fact, adjusting from the black to white mean on metropolitan percent black, income, and education still leaves substantial racial gaps. The sum of all of the marginal effects completely closes the racial gap in the transition probabilities (last row of the cell) for only 1 of the 16 cells shown in table 5.

Implication of matrices for levels of segregation

The transition matrix is informative about the patterns of migration that influence the current distribution

of neighborhood types. Yet it is difficult to understand the overall implication of the patterns for levels of segregation based on visual inspection of the numbers in the raw matrix. A better method is to evaluate the implication of the transition matrix for the population based on a model of how the transition probabilities relate to the population distribution.

To relate the transition matrix and the population, I use the transition probabilities to project the population distribution that would eventually result from a population moving according to the transition probabilities. This is an approach that has been used several times before for modeling mobility in different contexts (Rogers 1968; Gramlich, Laren, and Sealand 1992). We can then write the distribution of the population across neighborhood types at time t as a row vector, $d^t = (d_1, d_2, \ldots, d_k)$, where d_n is the proportion of the population in the nth neighborhood. Assuming the transition matrices do not change over time, the distribution at time t+1, d^{t+1}, is

$$d^{t+1} = d^t \boldsymbol{P}$$

Similarly the distribution at time t+5 is

$$d^{t+5} = d^t \boldsymbol{P}^5$$

Under quite general circumstances that all transition matrices in this study meet, when the transition probabilities remain fixed over a large number of generations, the population will approach a stable equilibrium population distribution d*.[27] The distribution of the population after a large number of generations, then, depends only on the transition matrix and is independent of the starting distribution.

---

[27] See Keyfitz (1977, p. 32-33) for a discussion of the conditions under which a transition matrix will result in a stable equilibrium distribution with positive fractions of the population in each cell. A sufficient, but not necessary, condition for such a stable equilibrium is that all of the transition probabilities in the matrix be positive. The demographic literature refers to this as the stable population, while the literature on Markov chains refers to d* as the "equilibrium" distribution.

The stable population has the property that

$$d^* = d^*\boldsymbol{P}$$

In other words, multiplying the stable distribution by the transition matrix does not alter the stable distribution. The stable distribution can be computed by algebraically finding the first eigenvector of the transition matrix or by raising the P matrix to a sufficiently high power to achieve the desired precision of the estimate and then multiplying by the starting distribution (see Keyfitz 1977).

The stable population distribution can be thought of as the point to which the current population is heading when subject to the transition probabilities in the transition matrix. For several reasons this matrix should not be considered an exact projection of population change.[28] It does, however, give an idea of what the population will move toward if subject to these probabilities.

An unrealistic aspect of this exercise is that the stable distribution does not allow for population responses or change in tract racial types that would probably follow from altered transition probabilities. If the black entry probabilities to white neighborhoods were to increase, this would be likely to cause an increase in the probability a white family will exit that neighborhood. Further, unless moves by blacks are evenly distributed over white neighborhoods, movement in will also probably cause some of the destination neighborhoods to switch to racially mixed. These distributions, then, are hypothetical changes that would result assuming no counteracting mobility tendencies, or changes in tract types.

Table 6 gives the stable population distributions corresponding to the actual and predicted

[28] Because the transition probabilities change over time, we will not reach the stable distribution before they change at least a little. In addition, the model does not allow for change in neighborhood types as blacks or whites enter under a hypothetical transition matrix (discussed in text below).

transition matrices. The two rows under panel A show the stable populations for the unadjusted black and white transition matrices, respectively. Mobility following the patterns of the raw transition matrices leads to extremely segregated distributions. In the stable distribution, nearly half of all blacks live in neighborhoods that are more than 70% black, and more than 70% of whites live in neighborhoods that are less than 10% black.

Panel B shows the stable populations for several predicted transition matrices for African Americans. Because of cases lost due to missing values on independent variables in the multinomial regression model, the raw matrix results (Panel A) and the results from the predicted matrices (Panels B and C) are not comparable. The first line of panels B and C provide a baseline against which the further hypothetical transition matrices can be compared.[29]

The results for blacks (panel B) suggest that changing from the white to the black mean of income and percent black leads to significantly more blacks in predominately white neighborhoods. The predicted distribution for a black population at the white mean for education, income, and percent black in the metropolitan area leads to a yet more integrated distribution. Further adjusting to the white mean on all model variables, however, does not lead to a much more integrated distribution. The variables with the strongest impact on the level of segregation are metropolitan percentage black, family income, and head's education, in that order; shifting from the black to white mean on the other variables has negligible effects. Although these changes are substantively significant, even adjusting to white

[29] The cases lost because of missing data are especially concentrated among persons who stayed in white neighborhoods (for both blacks and whites). Excluding these cases decreases the probability of staying in a white neighborhood. As a result, the share of the population that appears in the stable distribution corresponding to the predicted matrix at the own-group mean (first line of panels B and C) is much smaller than the corresponding stable distribution of the observed transition matrix (panel A).

means of all variables blacks are disproportionately located in black neighborhoods. This is true even though this procedure probably overestimates the integrating effect of these changes.

The results for whites (panel C) reaffirm that individual characteristics have little influence on white movement probabilities. Whites with the income level of the average black person and living in a metropolitan area with a substantial percentage black move away from black neighborhoods at almost the same rate as affluent whites in largely white metropolitan areas. Most lower income whites do not appear to be willing to trade lower rents for more black environments; instead, they appear almost as likely as more affluent whites to move in patterns that avoid contact with black neighbors.

CONCLUSIONS

What patterns of migration, then, maintain the high levels of racial segregation that characterize American cities?

The transition matrices clearly suggest white avoidance of neighborhoods with more than a few black residents, both by exiting and by not moving into neighborhoods with more than a few blacks. The choice of white destination tracts by movers is especially striking: census tracts with less than 10% of their population black are overwhelmingly the destination of white movers, even of white movers who are residents of black and racially mixed tracts. Correspondingly, we observe white and racially mixed neighborhoods becoming blacker around their African American residents as whites exit. These avoidance tendencies appear relatively insensitive to the characteristics of whites or the proportion of blacks in the metropolitan area. On average lower rents in black neighborhoods are not sufficient

incentives for even low-income whites to live there. Whites appear to strongly desire to avoid more than a few black neighbors, and move in patterns so as to realize this preference.

A second pattern is that blacks are much less likely to move into white neighborhoods than whites are. The fact that African Americans move into white neighborhoods much less often than whites is consistent with the theory that there are barriers to the mobility of African Americans into white neighborhoods, although this result could also be consistent with the possibility that blacks do not want to be racially isolated in all white neighborhoods. African Americans are much less likely to move into white neighborhoods than whites are, but African-American moves into white neighborhoods do occur regularly–about 10% of all black moves end up in a neighborhood with less than 10% of its population black, and 23% of all black moves end up in a neighborhood with less than 30% of its population black. African-American entry probabilities increase only marginally with an increase in income.

A third pattern is the migration of African Americans from predominately white areas to predominately black ones. Whites are much less likely to exit white neighborhood than are African Americans. Despite the amenities that tend to accompany white neighborhoods (low crime and poverty rates) an African-American person resident in a white census tract is about five times more likely to move out of a white census tract than a white person is (table 1, column 4). This return migration is a significant contributor to the overall segregation that we observe in urban areas. Such return migration is more likely among low income blacks, suggesting that financial pressure may be one factor causing this return migration. Yet almost no attention in the theoretical or empirical literature focuses on this population movement.

While it is certain that racial discrimination in housing markets contributes to segregation, the results in this article provide little evidence on which to conclude that housing discrimination is far more important than other factors, or that segregation would end in its absence. Instead, the results of this paper suggest that white avoidance is at least as important as housing market discrimination in upholding racial segregation. White avoidance is likely sufficient to keep American cities highly segregated even were barriers to the entry of white neighborhoods by blacks eliminated. This conclusion is consistent with a recent analysis of housing prices, which finds that whites are effectively paying a premium to live in predominately white areas (Cutler, Glaeser, and Vigdor 1999).

DISCUSSION

This reassessment of the forces that maintain segregation implies that we need to rethink the likely effect of policies on the extent of segregation. Policy suggestions for dealing with racial segregation have focused primarily on discriminatory practices in housing markets. All of Massey and Denton's (1993) policy recommendations to reduce racial segregation, for instance, are measures to reduce barriers to the entry of white neighborhoods by blacks, especially focusing on discriminatory practices in housing markets.

Discrimination by market agents has been shown to be widespread, and no doubt does increase the extent of racial segregation. Yet the case for housing discrimination as the main cause or a prerequisite for continued racial segregation is underwhelming. Given the strong evidence for white population decline in neighborhoods with more than a few blacks, if blacks did move into white neighborhoods this would likely speed up the process of racial neighborhood turnover. This would not

happen if the African-American population dispersed among white neighborhoods in low concentrations. But given the stated preference on surveys of most African-American families to live in neighborhoods with some other African-American families (although not in entirely black neighborhoods) such a widespread dispersal of the black population is unlikely. As long as whites are tolerant of only a few black neighbors, and blacks want more than a trivial number of black neighbors, migration will tend to lead to high levels of racial segregation in many urban spaces.[30]

One reason why policy recommendations to deal with segregation have so exclusively focused on barriers to entry of white neighborhoods may be because such discrimination has clear remedies: fair housing audits, aggressive prosecution of fair housing and hate crime laws, and outlawing practices that make it difficult for African Americans to learn about housing in white neighborhoods. Given the evidence of discrimination in housing markets, there is clearly a need for such policies–discrimination on the basis of ascribed attributes like race is inherently unjust, and widespread discrimination by Realtors and other market agents substantially worsens the housing choices of African Americans. The fairness rationale alone is a compelling reason for these measures. But the results here suggest these measures alone are unlikely to sharply reduce the extent of racial segregation in urban areas.

---

[30] Some authors argue that racial segregation is important in part because it creates negative white perceptions of black neighbors (Massey and Denton 1993; Yinger 1995). If whites had more black neighbors, the argument goes, their stereotypes and prejudices would be shattered by their encounters with African Americans. Racial segregation is then seen as a cause of prejudicial attitudes. Yet like the case for the importance of housing discrimination, the assertion that moving blacks and whites into the same neighborhood will substantially improve race relations is largely speculative. Allport's (1954) "contact hypothesis" suggests that interracial contact will improve inter-group attitudes *if* it is friendly contact between persons of equal status. An influx of black residents may lead to feelings of increased interracial competition and threat to white access to communal resources. Correspondingly, in countries with more immigrants, there is greater hostility toward them by native populations--quite the opposite of ending stereotypes, the presence of minorities has strengthened majority prejudices with the sentiment of fear (Quillian 1995).

Curtailing segregation in housing requires going beyond combating discriminatory practices to somehow check the collapse of white housing demand in neighborhoods with more than a few blacks. This is an especially difficult problem from a policy perspective. In contrast to anti-discrimination measures, policies to deal with the white aversion for black neighbors are beset with problems. Laws cannot reasonably force whites to stay in neighborhoods when they do not want to. Managed integration programs are designed to directly attack the problem of white flight and have experienced some success (Saltman 1990), but they are potentially in violation of fair housing laws and raise difficult ethical questions about the fairness of race-based incentives in the name of integration. Anti-discrimination policies are uncontroversial relative to these alternatives.

A different set of policy options for dealing with racial segregation are suggested recently by the work of David Harris (1999). His research suggests that whites are averse to black neighbors in large part because race is correlated with other characteristics that whites find undesirable. Neighborhoods with substantial numbers of black families also tend to have higher rates of poverty and corresponding problems such as high rates of crime (Jargowsky 1997). This suggests that policies that improve the economic well-being of the African-American population in general may have the beneficial consequence of reducing white resistance to black neighbors, a key force perpetuating segregation. At the same time, there remains evidence that is inconsistent with this thesis, such as the fact that even upper income blacks remain fairly segregated from whites. Only further research by a number of scholars can resolve these inconsistencies. This is one area where further social research could really be useful to better understand our policy options.

References

Agresti, Alan. 1990. *Categorical Data Analysis*. New York: John Wiley and Sons.

Alba, Richard and John R. Logan. 1993. "Minority Proximity to Whites in Suburbs: An Individual-Level Analysis of Segregation." *American Journal of Sociology* 98: 1388-1427.

Allport, Gordon W. 1954. *The Nature of Prejudice*. Garden City: Doubleday Anchor Books.

Banfield, Edward. 1970. *The Unheavenly City*. Boston: Little, Brown.

Clark, William A.V. 1986. "Residential Segregation in American Cities; A Review and Interpretation." *Population Research and Policy Review* 5: 95-117.

Clark, William A.V. 1991. "Residential Preferences and Neighborhood Racial Segregation: A Test of the Schelling Segregation Model." *Demography* 28(1).

Cutler, David, Edward Glaeser, and Jacob Vigdor. 1999. "The Rise and Decline of the American Ghetto." *Journal of Political Economy* 107(3): 455-506.

Denton, Nancy A. and Douglas S. Massey. 1988. "Residential Segregation of Blacks, Hispanics, and Asians by Socioeconomic Status and Generation." *Social Science Quarterly* 69(4): 797-817.

Duncan, Otis Dudley and Beverly Duncan. 1953. "Contributions to the Theory of Segregation Indexes." Urban Analysis Report 14, Chicago Community Inventory, University of Chicago.

Farley, Reynolds. 1977. "Residential Segregation in Urbanized Areas of the United States in 1970: An Analysis of Social Class and Racial Differences." *Demography* 14:497-518.

Farley, Reynolds and William Frey. 1994. "Changes in the Segregation of Whites from Blacks During the 1980s: Small Steps Toward a More Integrated Society." *American Sociological Review* 59: 23-45.

Farley, Reynolds, Howard Schuman, Suzanne Bianchi, Diane Colasanto, and Shirley Hatchett. 1978. "Chocolate City, Vanilla Suburbs: Will the Trend toward Racially Separate Communities Continue?" *Social Science Research* 7 (December): 319-44.

Farley, Reynolds, Charlotte Steeh, Maria Krysan, Tara Jackson, and Keith Reeves. 1994. Stereotypes and Segregation: Neighborhoods in the Detroit Area. *American Journal of Sociology* 100(3): 750-80.

Frey, William H. and Reynolds Farley. 1996. "Latino, Asian, and black segregation in U.S. metropolitan areas: are multiethnic metros different?" *Demography* 33(1): 35-50.

Galster, George C. 1986. "More than Skin Deep: The Effect of Housing Discrimination on the Extent and Pattern of Racial Residential Segregation in the United States." pp. 119-138 in John M. Goering, Ed., *Housing Desegregation and Federal Policy*. Chapel Hill: The University of North Carolina Press.

Galster, George C. 1987. "Residential Segregation and Interracial Economic Disparities: A Simultaneous-Equations Approach." *Journal of Urban Economics* 21:22-44.

Galster, George. 1988. "Residential Segregation in American Cities: A Contrary Review." *Population Research and Policy Review* 7(2): 93-112.

Galster, George. 1991. "Housing Discrimination and Urban Poverty of African Americans." *Journal of Housing Research* 2(2): 87-122.

Galster, George and W. Mark Keeney. 1988. "Race, Residence, and Economic Opportunity." *Urban Affairs Quarterly* 24(1): 87-117.

Gramlich, Edward, Deborah Laren, and Naomi Sealand. 1992. "Moving into and out of Poor Urban Areas." *Journal of Policy Analysis and Management* 11(2): 273-287.

Harris, David R. 1999. "'Property Values Drop When Blacks Move In, Because...': Racial and Socioeconomic Determinants of Neighborhood Desirability." *American Sociological Review* 64: 461-79.

Hill, Martha. 1992. *The Panel Study of Income Dynamics: A User's Guide*. Newbury Park: Sage.

Jackson, Kenneth T. 1985. *Crabgrass Frontier: The Suburbanization of the United States*. New York: Oxford University Press.

Jargowsky, Paul A., and David T. Ellwood. 1990. "Ghetto Poverty: A Theoretical and Empirical Framework." Malcolm Weiner Center for Social Policy, John F. Kennedy School of Government, Working Paper #H-90-7.

Jargowsky, Paul A. 1997. *Poverty and Place: Ghettos, Barrios, and the American City.* New York: Russell Sage Foundation.

Kalton, Graham. 1979. "Practical Methods for Estimating Survey Sampling Errors." *Bulletin of the International Statistical Institute* 47(3):495-514.

King, Gary, Robert Keohane, and Sidney Verba. 1994. *Designing Social Inquiry: Scientific Inference in Qualitative Research*. Princeton, NJ: Princeton University Press.

Keyfitz, Nathan. 1977. *Applied Mathematical Demography*. New York: John Wiley and Sons.

Lieberson, Stanley. 1963. *Ethnic Patterns in American Cities*. New York: Free Press.

Lieberson, Stanley. 1988. *Making It Count: the Improvement of Social Research and Theory*. Berkeley, CA: The University of California Press.

Logan, John R., Richard D. Alba, Tom McNulty, and Brian Fisher. 1996. "Making a Place in the Metropolis: Locational Attainment in Cities and Suburbs." *Demography* 33:443-53.

Massey, Douglas S. 1979. "Effects of Socioeconomic Factors on the Residential Segregation of Blacks and Spanish Americans in U.S. Urbanized Areas." *American Sociological Review* 44: 1015-22.

Massey, Douglas S. and Nancy A. Denton. 1988. "The Dimensions of Residential Segregation." Social Forces 67: 281-315.

Massey, Douglas S. and Nancy A. Denton. 1993. *American Apartheid: Segregation and the Making of the Underclass*. Cambridge, Mass: Harvard University Press.

Massey, Douglas S. and Shawn Kanaiaupuni. 1993. "Public Housing and the Concentration of Poverty." *Social Science Quarterly* 74(1): 109-122.

Massey, Douglas S., Andrew Gross, and Kumiko Shibuya. 1994. "Migration, Segregation, and the Geographic Concentration of Poverty." *American Sociological Review* 59:425-445.

Myrdal, Gunnar. 1944. *An American Dilemma: The Negro Problem and Modern Democracy*. New York: Harper and Brothers.

Oliver, Melvin and Thomas Shapiro. 1997. *Black Wealth, White Wealth: A New Perspective on Racial Inequality.* New York: Routledge.

Quillian, Lincoln. 1995. "Prejudice as a Response to Perceived Group Threat: Population Composition and Anti-Immigrant and Racial Prejudice in Europe." *American Sociological Review* 60: 586-611.

Rogers, Andrei. 1968. *Matrix Analysis of Interregional Population Growth and Distribution*. University of California Press: Berkeley.

Saltman, Juliet. 1990. *A Fragile Movement: The Struggle for Neighborhood Stabilization*. New York: Greenwood.

Schelling, Thomas. 1971. "Dynamic Models of Segregation." *Journal of Mathematical Sociology* 1: 143-86.

Schelling, Thomas. 1972. "A Process of Residential Segregation: Neighborhood Tipping." Pp. 157-184 in A. Pascal (ed.) *Racial Discrimination in Economic Life.* Lexington, MA: D.C. Heath.

Schuman, Howard and Lawrence Bobo. 1988. "Survey-based Experiments on White Racial Attitudes toward Residential Integration." *American Journal of Sociology* 94:273-299.

Schuman, Howard, Charlotte Steeh, Lawrence Bobo, and Maria Krysan. 1997. *Racial Attitudes in America: Trends and Interpretations*. Revised Edition. Cambridge, MA: Harvard University Press.

South, Scott J. and Kyle D. Crowder. 1998a. "Housing Discrimination and Residential Mobility: Impacts for Blacks and Whites." *Population Research and Policy Review* 17: 369-387.

South, Scott J., and Kyle D. Crowder. 1998b. "Leaving the 'Hood: Residential Mobility Between Black, White, and Integrated Neighborhoods." *The American Sociological Review* 63:17-26.

StataCorp. 1997a. *Stata Statistical Software: Release 5.0.* College Station, TX: Stata Corporation.

StataCorp. 1997b. *Stata Statistical Software Release 5.0 User's Guide*. College Station, TX: Stata Press.

Taeuber, Karl E. 1975. "Demographic Perspective on Housing and School Segregation." *Wayne Law Review* 21(3): 833-850.

Taeuber, Karl E. and Alma F. Taeuber. 1965. *Negroes in Cities: Residential Segregation and Neighborhood Change*. New York: Atheneum.

U.S. Bureau of the Census. 1998. "Geographical Mobility: March 1996 to March 1997." Current Population Report P20-510. Washington, D.C.

Villemez, Wayne. 1980. "Race, Class, and Neighborhood: Differences in the Residential Return on Individual Resources." *Social Forces* 59:414-30.

White, Michael J. 1986. "Segregation and Diversity: Measures in Population Distribution." *Population Index* 52 (Summer 1986): 198-221.

White, Michael J. 1987. *American Neighborhoods and Residential Differentiation*. New York: Russell Sage.

Wilson, Franklin D. and Roger B. Hammer. 1998. "Ethnic Residential Segregation and Its Consequences." Center for Demography and Ecology, University of Wisconsin–Madison, Working Paper #97-18.

Yinger, John. 1986. "Measuring Racial Discrimination with Fair Housing Audits: Caught in the Act." *The American Economic Review* 76(5): 881-893.

Yinger, John. 1995. *Closed Doors, Opportunities Lost: The Continuing Costs of Housing Discrimination*. Russell Sage: New York.

Zubrinsky, Camille L., and Lawrence Bobo. 1996. "Prismatic Metropolis: Race and Residential Segregation in the City of Angels." *Social Science Research* 25: 335-374.

Table 1: Exit probabilities from neighborhood types by racial composition and source of exit

Whites

Origin Neighborhood Type	(1) Probability of moving (to another tract)	(2) Probability of exiting tract type, if moved	(3) Probability of exiting tract type by moving	(4) Probability of exiting tract type due to neighborhood change	(5) Overall probability of exiting tract
White (less than 10% black)	0.108	0.331	0.036	0.005	0.041
	(0.0070)	(0.0124)	(0.0034)	(0.0008)	(0.0037)
Predominately White (10-30% black)	0.152	0.844	0.128	0.029	0.157
	(0.0139)	(0.0237)	(0.0128)	(0.0054)	(0.0122)
Racially Mixed (30-70% Black)	0.174	0.937	0.163	0.021	0.184
	(0.0453)	(0.0238)	(0.0460)	(0.0038)	(0.0479)
Black (70% + Black)	0.221	0.787	0.174	0.000	0.174
	(0.0562)	(0.1412)	(0.0347)	(!)	(0.0347)
Non-Metropolitan (#)			0.021		0.021
			(0.0017)		(0.0017)
Non-Tract Metropolitan (#)			0.094		0.094
			(0.0061)		(0.0061)

African-Americans

Origin Neighborhood Type	(1) Probability of moving (to another tract)	(2) Probability of exiting tract type, if moved	(3) Probability of exiting tract type by moving	(4) Probability of exiting tract type due to neighborhood change	(5) Overall probability of exiting tract
White (less than 10% black)	0.246	0.778	0.191	0.017	0.208
	(0.0268)	(0.0136)	(0.0203)	(0.0087)	(0.0284)
Predominately White (10-30% black)	0.176	0.769	0.136	0.057	0.193
	(0.0213)	(0.0305)	(0.0186)	(0.0094)	(0.0173)
Racially Mixed (30-70% Black)	0.159	0.673	0.107	0.030	0.137
	(0.0191)	(0.0981)	(0.0272)	(0.0033)	(0.0261)
Black (70% + Black)	0.165	0.390	0.064	0.007	0.071
	(0.0086)	(0.0209)	(0.0041)	(0.0017)	(0.0048)
Non-Metropolitan (#)			0.019		0.019
			(0.0014)		(0.0014)
Non-Tract Metropolitan (#)			0.119		0.119
			(0.0267)		(0.0267)

Numbers in parentheses are standard errors.
"Moves" are defined as moving out of a census tract, which are not defined for persons in non-metropolitan and non-tract metropolitan areas because they do not live in tracts; I have defined "move" from these types as any relocation outside of these types.

! Because there is no variation in this cell, no standard error can be computed.

Table 2: Neighborhood type transition matrix, mover person-years only, by race

Whites

Origin neighborhood type	Destination Neighborhood Type: White	Predominately white	Racially mixed	Black	Non-metropolitan	Non-tract metropolitan
White (less than 10% black)	0.669	0.074	0.021	0.005	0.105	0.127
	(0.0124)	(0.0043)	(0.0022)	(0.0010)	(0.0065)	(0.0070)
Predominately White (10-30% black)	0.575	0.156	0.077	0.010	0.090	0.093
	(0.0239)	(0.0237)	(0.0201)	(0.0051)	(0.0189)	(0.0122)
Racially Mixed (30-70% Black)	0.502	0.198	0.063	0.020	0.062	0.155
	(0.0460)	(0.0397)	(0.0238)	(0.0065)	(0.0161)	(0.0314)
Black (70% + Black)	0.353	0.198	0.115	0.213	0.058	0.062
	(0.1292)	(0.1212)	(0.0730)	(0.1412)	(0.0381)	(0.0781)
Non-Metropolitan (#)	0.554	0.093	0.048	0.005	0.000	0.300
	(0.0204)	(0.0064)	(0.0146)	(0.0018)	(!)	(0.0294)
Non-Tract Metropolitan (#)	0.622	0.105	0.029	0.002	0.242	0.000
	(0.0234)	(0.0088)	(0.0054)	(0.0008)	(0.0231)	(!)

African-Americans

Origin neighborhood type	Destination Neighborhood Type: White	Predominately white	Racially mixed	Black	Non-metropolitan	Non-tract metropolitan
White (less than 10% black)	0.222	0.146	0.328	0.204	0.037	0.063
	(0.0136)	(0.0130)	(0.0416)	(0.0421)	(0.0161)	(0.0166)
Predominately White (10-30% black)	0.148	0.231	0.253	0.229	0.058	0.081
	(0.0231)	(0.0305)	(0.0450)	(0.0257)	(0.0199)	(0.0342)
Racially Mixed (30-70% Black)	0.128	0.157	0.327	0.307	0.018	0.063
	(0.0370)	(0.0178)	(0.0981)	(0.0792)	(0.0032)	(0.0113)
Black (70% + Black)	0.053	0.095	0.176	0.610	0.022	0.044
	(0.0154)	(0.0109)	(0.0103)	(0.0209)	(0.0047)	(0.0082)
Non-Metropolitan (#)	0.133	0.178	0.171	0.415	0.000	0.104
	(0.0403)	(0.0430)	(0.0088)	(0.0761)	(!)	(0.0168)
Non-Tract Metropolitan (#)	0.121	0.169	0.221	0.399	0.090	0.000
	(0.0339)	(0.0308)	(0.0232)	(0.0301)	(0.0340)	(!)

The number in the cell is the probability of moving to the destination (column) tract type at time t+1 given the origin (row) tract type at time t.

Numbers in Parentheses are standard errors.

"Moves" for these tract types are unobserved except when the respondent moves out of the type. For this reason the probabilities are not strictly comparable to the other row types.

! Because there is no variation in this cell, no standard error can be computed.

Table 3: Neighborhood type transition matrix, stayer person-years only, by race

Whites

	Destination Neighborhood Type			
Origin neighborhood type	White	Predominately white	Racially mixed	Black
White (less than 10% black)	0.994	0.006		
	(0.0010)	(0.0010)		
Predominately White (10-30% black)	0.005	0.966	0.029	
	(0.0021)	(0.0062)	(0.0055)	
Racially Mixed (30-70% Black)		0.015	0.975	0.009
		(0.0068)	(0.0054)	(0.0049)
Black (70% + Black)			0.000	1.000
			(!)	(!)

African-Americans

	Destination Neighborhood Type			
Origin neighborhood type	White	Predominately white	Racially mixed	Black
White (less than 10% black)	0.978	0.022		
	(0.0122)	(0.0122)		
Predominately White (10-30% black)	0.002	0.930	0.068	
	(0.0008)	(0.0107)	(0.0109)	
Racially Mixed (30-70% Black)		0.006	0.964	0.030
		(0.0022)	(0.0037)	(0.0039)
Black (70% + Black)			0.008	0.992
			(0.0020)	(0.0020)

The number in the cell is the probability of being in the destination (column) tract type at time t+1 given the origin (row) tract type at time t, conditional on not moving.
Numbers in Parentheses are standard errors.
! Because there is no variation in this cell, no standard error can be computed.
Estimated probabilities in the table are based on tract-to-tract interpolation; see text. Non-metropolitan and non-tract metropolitan residents cannot change type by neighborhood change.
Blank cells can be interpreted as a zero probability

Table 4: Marginal effect on probability in transition matrix based on a change in the variable from the black to the white mean, whites in the PSID

Origin Neighborhood Type		Indep. Variable	Destination Neighborhood Type: White	Predom. white	Racially mixed	Black
White	Marginal Effects	family income	0.005 *	-0.003 *	-0.001 *	-0.000 *
			(0.0017)	(0.0010)	(0.0004)	(0.0001)
		head's education	0.001	-0.001	-0.000	-0.000
			(0.0006)	(0.0004)	(0.0000)	(0.0000)
		MSA % Black	-0.000	0.001 *	0.000 *	0.000
			(0.0003)	(0.0002)	(0.0000)	(0.0000)
	White/Black Transition Prob. Diff.		0.170	-0.040	-0.080	-0.049
Predominately White	Marginal Effects	family income	-0.002	-0.000	0.004	0.000
			(0.0066)	(0.0081)	(0.0061)	(0.0000)
		head's education	0.000	-0.000	0.001	-0.000
			(0.0017)	(0.0031)	(0.0024)	(0.0000)
		MSA % Black	-0.003 *	0.003	-0.000	-0.000
			(0.0011)	(0.0016)	(0.0016)	(0.0000)
	White/Black Transition Prob. Diff.		0.065	0.040	-0.066	-0.038
Racially Mixed	Marginal Effects	family income	-0.014	-0.010 *	0.024	-0.000
			(0.0186)	(0.0044)	(0.0175)	(0.0000)
		head's education	0.002	0.002	-0.004	-0.000
			(0.0052)	(0.0016)	(0.0048)	(0.0000)
		MSA % Black	-0.007	-0.002 *	0.008	0.000
			(0.0039)	(0.0007)	(0.0041)	(0.0000)
	White/Black Transition Prob. Diff.		0.069	0.017	-0.041	-0.063
Black	Marginal Effects	family income	0.005	-0.000	-0.000	-0.005
			(0.1333)	(0.0000)	(0.0000)	(0.1333)
		head's education	0.075	0.000	0.000	-0.075
			(0.0493)	(0.0000)	(0.0000)	(0.0493)
		MSA % Black	-0.009	0.000	-0.000	0.009
			(0.0172)	(0.0000)	(0.0000)	(0.0172)
	White/Black Transition Prob. Diff.		0.070	0.029	-0.011	-0.096

Standard Errors in parentheses. * = coef/se > 2.
The numbers to the right of the variable names is the estimated change in the probability from changing the mean of the independent variable by an amount equal to the difference between the black and white mean, evaluated at the black mean. The difference in the transition probabilities is the difference between the white and black transition probabilities (computed from appendix table 2). The multinomial logistic regression includes other variables not shown; see text.

Table 5: Marginal effect on probability in transition matrix based on a change in the variable from the black to the white mean, African-Americans in the PSID

Origin Neighborhood Type		Indep. Variable	Destination Neighborhood Type: White	Predom. white	Racially mixed	Black
White	Marginal Effects	family income	0.062 *	-0.016 *	-0.008	-0.032 *
			(0.0189)	(0.0074)	(0.0143)	(0.0110)
		head's education	0.012	0.001	-0.002	-0.004
			(0.0153)	(0.0059)	(0.0078)	(0.0063)
		MSA % Black	0.034 *	0.005	0.011	-0.029 *
			(0.0149)	(0.0101)	(0.0094)	(0.0113)
	White/Black Transition Prob. Diff.		0.170	-0.040	-0.080	-0.049
Predominately White	Marginal Effects	family income	0.002	0.031 *	-0.008	-0.024 *
			(0.0034)	(0.0099)	(0.0066)	(0.0077)
		head's education	-0.001	0.003	0.006	-0.006
			(0.0031)	(0.0085)	(0.0049)	(0.0056)
		MSA % Black	0.010 *	-0.025	0.004	0.005
			(0.0043)	(0.0160)	(0.0060)	(0.0086)
	White/Black Transition Prob. Diff.		0.065	0.040	-0.066	-0.038
Racially Mixed	Marginal Effects	family income	0.005	0.008 *	0.011	-0.023 *
			(0.0031)	(0.0036)	(0.0111)	(0.0080)
		head's education	0.000	0.000	0.003	-0.003
			(0.0030)	(0.0031)	(0.0045)	(0.0036)
		MSA % Black	0.013 *	0.001	0.025 *	-0.040 *
			(0.0033)	(0.0084)	(0.0112)	(0.0066)
	White/Black Transition Prob. Diff.		0.069	0.017	-0.041	-0.063
Black	Marginal Effects	family income	-0.000	-0.001	-0.004	0.006
			(0.0011)	(0.0015)	(0.0030)	(0.0037)
		head's education	0.002 *	0.002 *	0.003 *	-0.007 *
			(0.0005)	(0.0010)	(0.0011)	(0.0017)
		MSA % Black	0.003 *	0.003 *	0.008 *	-0.014 *
			(0.0010)	(0.0012)	(0.0029)	(0.0032)
	White/Black Transition Prob. Diff.		0.070	0.029	-0.011	-0.096

Standard Errors in parentheses. Logistic Regression coefficients in brackets. The white census tract type is the reference group. * = coef/se > 2.

The numbers to the right of the variable names is the estimated change in the probability from changing the mean of the independent variable by an amount equal to the difference between the black and white mean, evaluated at the black mean. The difference in the transition probabilities is the difference between the white and black transition probabilities (computed from appendix table 2). The multinomial logistic regression includes other variables not shown; see text.

Table 6: Stable populations corresponding to actual and adjusted transition matrices

Transition Matrix Description	Stable Population Distributions, Transition Matrices: White (less than 10% black)	Predominately White (10-30% black)	Racially Mixed (30-70% Black)	Black (70% + Black)	Non-Tract Metropolitan (#)
A: Observed Transition Matrices					
Unadjusted Black Transition Matrix	6.9%	11.3%	26.8%	46.9%	8.1%
Unadjusted white transition matrix	70.8%	9.1%	3.2%	1.7%	15.2%
B. Predicted Transition Matrices, African-Americans					
At black means	3.0%	7.4%	18.0%	64.1%	7.4%
At white income mean	4.7%	9.6%	18.6%	60.1%	7.0%
At white mean of metropolitan area percent black	6.7%	9.2%	25.7%	49.4%	9.0%
At white mean on education, income, and MSA % Black	12.0%	13.0%	27.5%	39.1%	8.4%
At white mean, all independent variables	10.3%	13.2%	29.5%	40.1%	6.9%
C. Predicted Transition Matrices, whites					
At white means, all independent variables	47.5%	22.4%	14.0%	1.4%	14.7%
At black means, all independent variables	45.6%	21.7%	14.5%	3.7%	14.5%

Number in the cell is the proportion in the neighborhood type at the stable population corresponding to the given transition matrix. See text.

Appendix Table 1: Distribution of person-years among neighborhood types, by race, 1979-90 PSID

	Whites		African-Americans	
Neighborhood Type	Person Years (Unweighted)	Percentage of Person Years (Weighted)	Person Years (Unweighted)	Percentage of Person Years (Weighted)
White (less than 10% black)	28914	44.6%	1874	4.4%
Predominately White (10-30% black)	3460	4.7%	3355	7.4%
Racially Mixed (30-70% Black)	1386	1.6%	6748	18.5%
Black (70% + Black)	380	0.3%	22654	36.7%
Non-Metropolitan	26574	38.3%	10198	26.3%
Non-Tract	7705	10.5%	4354	6.7%

Tract data is based on tract-to-tract interpolation; see text.

Appendix Table 2: Neighborhood type transition matrix (overall), by race

Whites

Origin neighborhood type	Destination Neighborhood Type					
	White	Predominately white	Racially mixed	Black	Non-metropolitan	Non-tract metropolitan
White (less than 10% black)	0.959	0.013	0.002	0.001	0.011	0.014
	(0.0037)	(0.0013)	(0.0003)	(0.0001)	(0.0013)	(0.0015)
Predominately White (10-30% black)	0.091	0.843	0.036	0.002	0.014	0.014
	(0.0082)	(0.0122)	(0.0059)	(0.0008)	(0.0036)	(0.0022)
Racially Mixed (30-70% black)	0.088	0.047	0.816	0.011	0.011	0.027
	(0.0218)	(0.0191)	(0.0479)	(0.0039)	(0.0049)	(0.0075)
Black (70% + black)	0.078	0.044	0.025	0.826	0.013	0.014
	(0.0241)	(0.0207)	(0.0210)	(0.0347)	(0.0086)	(0.0187)
Non-Metropolitan	0.012	0.002	0.001	0.000	0.979	0.006
	(0.0013)	(0.0002)	(0.0004)	(*)	(0.0017)	(0.0004)
Non-Tract Metropolitan	0.058	0.010	0.003	0.000	0.023	0.906
	(0.0050)	(0.0013)	(0.0005)	(0.0001)	(0.0018)	(0.0061)

Blacks

Origin neighborhood type	Destination Neighborhood Type					
	White	Predominately white	Racially mixed	Black	Non-metropolitan	Non-tract metropolitan
White (less than 10% black)	0.792	0.053	0.081	0.050	0.009	0.016
	(0.0284)	(0.0116)	(0.0074)	(0.0149)	(0.0048)	(0.0027)
Predominately White (10-30% black)	0.027	0.807	0.101	0.040	0.010	0.014
	(0.0048)	(0.0174)	(0.0133)	(0.0040)	(0.0044)	(0.0074)
Racially Mixed (30-70% black)	0.020	0.030	0.863	0.074	0.003	0.010
	(0.0079)	(0.0033)	(0.0261)	(0.0184)	(0.0007)	(0.0015)
Black (70% + black)	0.009	0.016	0.036	0.929	0.004	0.007
	(0.0023)	(0.0021)	(0.0026)	(0.0048)	(0.0007)	(0.0013)
Non-Metropolitan	0.003	0.003	0.003	0.008	0.981	0.002
	(0.0009)	(0.0010)	(0.0004)	(0.0010)	(0.0014)	(0.0002)
Non-Tract Metropolitan	0.014	0.020	0.026	0.047	0.011	0.881
	(0.0068)	(0.0016)	(0.0055)	(0.0098)	(0.0060)	(0.0267)

The number in the cell is the probability of being in the destination (column) tract type at time t+1 given the origin (row)
Numbers in Parentheses are standard errors.

Appendix table A3: Effect on the logit (log odds) based on a change in the variable from the black to the white mean, whites in the PSID

Origin Neighborhood Type		Indep. Variable	Destination Neighborhood Type: White	Predom. white	Racially mixed	Black
White	Marginal Effects	family income	[ref.]	-0.333 *	-1.160 *	-1.296 *
				(0.0875)	(0.3126)	(0.1425)
		head's education	[ref.]	-0.093	-0.021	-0.178
				(0.0542)	(0.0911)	(0.2006)
		MSA % Black	[ref.]	-0.473 *	-0.522 *	-0.514 *
				(0.1429)	(0.1802)	(0.2557)
Predominately White	Marginal Effects	family income	[ref.]	0.036	0.133	0.449
				(0.1184)	(0.1922)	(0.2613)
		head's education	[ref.]	-0.004	0.026	-0.472
				(0.0480)	(0.1164)	(0.2914)
		MSA % Black	[ref.]	-0.419 *	-0.334	0.979 *
				(0.1249)	(0.3738)	(0.1533)
Racially Mixed	Marginal Effects	family income	[ref.]	-0.242	0.206	-0.223
				(0.3568)	(0.2820)	(0.7017)
		head's education	[ref.]	0.119	-0.045	-0.689 *
				(0.2035)	(0.1226)	(0.1364)
		MSA % Black	[ref.]	-0.113	-0.769 *	-0.974
				(0.2256)	(0.2740)	(0.6433)
Black	Marginal Effects	family income	[ref.]	-0.238	-3.029 *	-0.035
				(1.1863)	(0.9946)	(1.0158)
		head's education	[ref.]	-0.307	-0.627	-0.914 *
				(0.4317)	(0.4231)	(0.2661)
		MSA % Black	[ref.]	-1.507 *	0.141	-0.564
				(0.6584)	(1.8002)	(0.6970)

Standard Errors in parentheses. * = coef/se > 2.

The numbers to the right of the variable names is the estimated change in the logit of enterint the neighborhood type relative to white (less than 10% black) neighborhoods from changing the mean of the independent variable by an amount equal to the difference between the black and white mean, evaluated at the black mean. The multinomial logistic regression includes other variables not shown; see text.

Appendix table A4: Effect on the logit (log odds) based on a change in the variable from the black to the white mean, blacks in the PSID

Origin Neighborhood Type		Indep. Variable	Destination Neighborhood Type: White	Predom. white	Racially mixed	Black
White	Marginal Effects	family income	[ref.]	-0.346 *	-0.210	-0.641 *
				(0.1338)	(0.2380)	(0.2527)
		head's education	[ref.]	-0.006	-0.057	-0.077
				(0.1020)	(0.1441)	(0.1192)
		MSA % Black	[ref.]	0.033	0.139	-0.562 *
				(0.1819)	(0.1905)	(0.2145)
Predominately White	Marginal Effects	family income	[ref.]	-0.063	-0.224	-0.579 *
				(0.1912)	(0.2230)	(0.2836)
		head's education	[ref.]	0.074	0.162	-0.058
				(0.1655)	(0.1792)	(0.1785)
		MSA % Black	[ref.]	-0.549	-0.461	-0.416
				(0.3151)	(0.2676)	(0.2238)
Racially Mixed	Marginal Effects	family income	[ref.]	-0.007	-0.294 *	-0.568 *
				(0.1675)	(0.1263)	(0.1466)
		head's education	[ref.]	0.011	0.002	-0.041
				(0.2154)	(0.1912)	(0.1956)
		MSA % Black	[ref.]	-0.744	-0.767 *	-1.249 *
				(0.3820)	(0.1914)	(0.2013)
Black	Marginal Effects	family income	[ref.]	-0.061	-0.065	0.078
				(0.2745)	(0.2268)	(0.1837)
		head's education	[ref.]	-0.047	-0.144 *	-0.279 *
				(0.1195)	(0.0660)	(0.0808)
		MSA % Black	[ref.]	-0.140	-0.171	-0.509 *
				(0.2890)	(0.2651)	(0.2333)

Standard Errors in parentheses. * = coef/se > 2.

The numbers to the right of the variable names is the estimated change in the logit of enterint the neighborhood type relative to white (less than 10% black) neighborhoods from changing the mean of the independent variable by an amount equal to the difference between the black and white mean, evaluated at the black mean. The multinomial logistic regression includes other variables not shown; see text.

Center for Demography and Ecology
University of Wisconsin
1180 Observatory Drive Rm. 4412
Madison, WI 53706-1393
U.S.A.
608/262-2182
FAX 608/262-8400
comments to: quillian@ssc.wisc.edu
requests to: cdepubs@ssc.wisc.edu