THE RISE AND DECLINE OF THE
AMERICAN GHETTO

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ABSTRACT

This paper examines segregation in American cities from 1890 to 1990. We divide the century into three time periods. From 1890 to 1940, ghettos were born as blacks migrated to urban areas and cities developed vast expanses filled with nearly exclusively black housing. From 1940 to 1970, black migration continued and ghettos expanded. Since 1970, there has been a decline in segregation as blacks have moved to suburban areas and central cities have become less segregated. Across all of these time periods there is a strong positive relation between urban population or density and segregation. We then examine why segregation has varied so much over time. We find evidence that the mechanism sustaining segregation has changed. In the mid-20th century, segregation was a product of collective actions taken by whites to exclude blacks from their neighborhoods. By 1990, these legal barriers enforcing segregation had been replaced by decentralized racism, where whites pay more than blacks to live in predominantly white areas.

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I. Introduction

Recent research has provided substantial evidence that who one lives near affects one's economic and social outcomes. Case and Katz (1991) show that youths in a central city are affected by the characteristics of their neighbors. Borjas (1995) argues that ethnic and neighborhood effects are important in explaining outcomes. Cutler and Glaeser (1996) show that outcomes for blacks are worse in cities where blacks are more segregated from whites compared to cities where blacks are less segregated from whites.[1] Since neighbors are so important in determining economic outcomes, it is important to understand how neighborhoods are formed. For a vast majority of blacks, the neighborhood has come to mean an area that is nearly exclusively black -- which we term a ghetto.[2] In this paper, we examine the birth and development of ghettos in 20th century America.

Despite much research on segregation and racial tension (e.g., DuBois, 1899; Myrdal, 1944; Massey and Denton, 1993) and despite the many excellent histories of individual ghettos that have been compiled (Glazer and Moynihan, 1963, Osofsky, 1967, Spear, 1968, Kusmer, 1976, Zunz, 1982), there are no consistent long-term measures of the extent of ghettoization in the United States.[3] Our first goal in this paper is to document changes in racial segregation in the United States over time. We present uniform, consistent measures of segregation from 1890 to 1990, with sample sizes ranging from 54 cities in 1900 to 313 metropolitan areas (MSAs) today.

The data suggest a clear division of the history of segregation into three periods. The first period, from 1890 to 1940, is the birth of the ghetto, accompanied by and perhaps due to the

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[1] Other work investigate the relation between poverty and segregation, including O'Regan and Quigley (1994), Korenman, Sjaastad, and Jargowsky (1995) and Yinger (1995).

[2] The term "ghetto" is often used synonymously with the term "slum". We define ghettos based on racial or ethnic composition, not quality of living area

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first large scale black migration from the rural South to the urban North. The changes in urban residential location were indeed dramatic. Where only one city had a ghetto by our definition in 1890 (Norfolk, Virginia), 55 cities had a ghetto by 1940. In 1890, the average urban black lived in a neighborhood that was 27 percent black; by 1940, that neighborhood was 43 percent black.[4] The second period, from 1940 to 1970, encompasses the consolidation and expansion of ghettos. With continuing black migration to urban areas and increased racial tensions, ghettos came to dominate the central city. The peak period for segregation in the United States was in 1970. In that year, the average black in urban America lived in a neighborhood that was 68 percent black. In the third period, from 1970 to 1990, segregation fell throughout the country, particularly in the rapidly growing cities of the South and West (Farley and Frey, 1992). By 1990, the average black lived in a neighborhood that was 56 percent black.

While segregation has changed dramatically over the past century, the relative segregation of different cities has been much more persistent. The correlation across cities between segregation in 1890 and segregation in 1990 is as high as 50 percent. Of the five most segregated cities in the United States in 1890, three are in the top five today (Chicago, Cleveland and Detroit).

In the second part of the paper, we consider why this pattern developed and perpetuated itself. We group theories about segregation into three classes: the "port of entry" theory, where blacks prefer to live among members of their own race, particularly when they are new migrants to an urban area; the "collective action racism" theory, where whites use legal, quasi-legal, or violent, illegal barriers to keep blacks out of white neighborhoods; and the "decentralized racism" theory, where whites segregate themselves by paying more to live with members of their own race.

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[4] Our definition of "neighborhood" here is city ward. In years after 1940, we use census tracts as neighborhoods. A complete discussion of sub-city divisions follows.

All three theories predict that segregation should change rapidly with the influx of new migrants, unfamiliar with urban life, to a city. This is true empirically. The theories also suggest that segregation should rise as the number of neighborhoods rise and as people become more mobile. We find that larger cities do have greater levels of segregation than smaller cities, but we find no significant evidence that segregation is related to mobility costs.

To differentiate among the three theories, we use two types of evidence: information on housing rents, and attitudes towards integration. If whites and blacks are segregated because blacks prefer segregated neighborhoods, or because whites make it impossible for blacks to live in integrated neighborhoods, then blacks should pay more for equivalent housing than whites. To the extent that the demand for segregation comes from blacks, then housing rents should be particularly high among new black migrants to urban areas. In contrast, if blacks and whites are segregated because whites demand housing in white areas more than blacks demand housing in those areas, then whites should pay more for housing than blacks. We find that at the middle of the century, blacks paid relatively more for housing in more segregated compared to less segregated cities. This additional housing cost was paid by all blacks, not just by recent migrants. These facts suggests that at mid-century, segregation was enforced by collective actions on the part of whites to limit the access of blacks to white neighborhoods. By 1990, however, whites pay more for equivalent housing than blacks in more segregated areas, suggesting that decentralized racism has replaced centralized racism as the factor influencing residential location. This evidence is generally consistent with attitudes towards integration among blacks and whites over the past 20 years.

The next section introduces our measures of segregation. Section III discusses the data and presents the time series of segregation in the U.S. Section IV examines cross-section differences in segregation. Section V considers alternative theories for the formation and persistence of ghettos. Section VI presents three case studies of segregation in particular cities. Section VII reports results from cross-city regressions. The last Section concludes.

II. Measuring Segregation

There are many dimensions to the spatial segregation of different racial groups. Since no one measure can capture them all, we use a multi-faceted approach to measuring segregation.[5]

A first dimension of segregation is the *dissimilarity* of black and white residences. If blacks disproportionately reside in some areas of a city relative to whites, we say that dissimilarity between the two races is high. The Index of Dissimilarity, proposed by Duncan and Duncan (1955) and used by Taeuber and Taeuber (1965), is a natural measure of dissimilarity. Indexing areas by i, we define dissimilarity as:

$$Index \ of \ Dissimilarity \ = \ \frac{1}{2} \sum_{i=1}^{N} \left| \frac{Black_i}{Black} - \frac{Non-Black_i}{Non-Black} \right| \tag{1}$$

where $Black_i$ is the number of blacks in area i, $Black$ is the number of blacks in the city as a whole, $Non\text{-}black_i$ is the number of non-blacks in area i, and $Non\text{-}black$ is the number of non-blacks in the city. If blacks are distributed evenly throughout the city, the term in absolute value brackets will equal zero in every neighborhood and thus zero for the city as a whole. If blacks and non-blacks reside in completely different areas, the index will equal one. This index can be shown to answer the question: what share of the black (or white) population would need to change areas for the races to be evenly distributed within a city? Typically, a dissimilarity index of less than .3 is considered low, an index between .3 and .6 is considered moderate, and an index above .6 is considered high (Massey and Denton, 1993). This particular functional form is justified by a model in the Theory Appendix.

But even if blacks are disproportionately located in particular neighborhoods relative to whites, that does not mean that blacks and whites have no contact (Blau, 1977). In measuring the *isolation* of blacks from whites, we want to know how much interaction there

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[5] See Massey and Denton (1988b) and Taeuber and Taeuber (1965) for discussion.

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is between the races. To measure isolation, we follow Bell (1954), and start with the percent black of the area occupied by the average black or $\Sigma^N_{i=1}$ *(Black$_i$/Black)* · *(Black$_i$/Total$_i$)*. If blacks and whites are equally distributed throughout the city, this measure would be exactly the share of the city that is black. To separate out the size effect of the black population from its distribution, we subtract the percent black in the city as a whole. When there are low numbers of blacks in the city, it will be impossible for blacks to be completely isolated from whites; the maximum value of this measure is *Min(Black/Total$_i$,1)* - *Black/Total*, where *Total$_i$* is the size of the minimum population area.[6] We divide our index by this quantity so that the adjusted index ranges from 0 to 1. Our measure of isolation is therefore:

$$Index \ of \ Isolation \ = \ \frac{\sum\limits_{i=1}^{N} \left(\dfrac{Black_i}{Black} \right) \cdot \left(\dfrac{Black_i}{Total_i} \right) - \left(\dfrac{Black}{Total} \right)}{Min\left(\dfrac{Black}{Total_i}, 1 \right) - \left(\dfrac{Black}{Total} \right)} \qquad (2)$$

As a summary measure, we characterize a city as having a *ghetto* if the index of dissimilarity is greater than .6 and the index of isolation is greater than .3.

Dissimilarity and isolation are not the only potential measures of spatial concentration. Massey and Denton (1988b) characterize segregation along five dimensions: evenness (dissimilarity), exposure (isolation), concentration (the amount of physical space occupied by the minority group), clustering (the extent to which minority neighborhoods abut one another), and centralization (proximity to the center of the city). The last three dimensions require detailed data on physical location of areas and land size that we do not have for all years. We have constructed all five measures of segregation in 1990, which we report in

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[6]White (1986) suggests always dividing by one minus the black share in the city's population. Our two measures are identical for most modern cities but in a city with very few blacks our measure should be more accurate.

Appendix Table A4. Dissimilarity, isolation, and clustering are all highly correlated (correlation coefficients over .72). Concentration, and particularly centralization, are less highly correlated with the other measures. These results suggest that by 1990 at least, ghettos were relatively contiguous areas mainly occupied by blacks. Ghettos, at least in 1990, are not of any particular size or location in the city, however. It would be quite valuable to construct such indices for historical periods.

III. Segregation in the Past Century

We begin our analysis of the history of segregation with 1890 because that year predates the first wave of large black migration from the South to the urban North. Segregation in 1890 gives us a snapshot of what racial integration was like when whites in vast parts of the country had relatively little contact with blacks.

Data on segregation are based on information in the decadal censuses. The censuses are the only source of long-term sub-city data on neighborhood characteristics. Not surprisingly, the Census Bureau has changed its methods and definitions over the past century. Thus, ensuring comparability throughout the entire time period is difficult. We describe our data collection and adjustments in the Data Appendix, and give just a brief summary of our methods here.[7]

In the post-World War II censuses, we proxy for neighborhoods with census tracts, the most common measure of intra-city spatial distribution. A census tract is an area of roughly 4,000 people separated by observable boundaries such as rivers, highways, and major streets. In most cities, census tracts were not delineated until 1940 or 1950. Prior to then, the census reported population at the ward level. Wards are political jurisdictions made up by the city for uses such as city governance. A ward typically had many more people than a census tract

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[7] The complete data set is available from the authors on request.

does now. As the size of the neighborhood increases, the dissimilarity index will fall (unless blacks and whites are evenly distributed). Thus, ward-based segregation measures are generally below tract-based measures. We adjust the ward data to match the mean of the census tract data, so that changes in the size of neighborhood units will not affect segregation over time (see the Data Appendix).

The ward data are of some concern if wards are drawn to minimize or maximize segregation. Fortunately, the census reported both ward and tract data for many cities in 1940, so we can measure the correlation between the two. For the Northeast and Midwest, that correlation is high (.82 for dissimilarity in the Northeast [N=19] and .81 for the Midwest [N=16]), giving us confidence in ward-based segregation for those regions. We also constructed tract level measures of segregation in Cleveland going back to 1910; tract-based segregation moved closely with ward-based segregation. For Southern cities, however, the correlation between tract- and ward-based dissimilarity is lower (.59 [N=11], or .35 with one outlier removed). Indeed, case studies of particular cities such as Atlanta suggest that ward-based segregation may significantly understate the true degree of segregation at the sub-ward level.[8] Thus, we have less confidence in pre-World War II segregation in the South than in the Northeast or Midwest.

Before 1940, we measure segregation for cities, the standard political units. After World War II, widescale suburbanization led the census to delineate multi-county metropolitan areas, SMSAs (Standard Metropolitan Statistical Areas), which include both cities and their surrounding suburbs. Since we would like to measure segregation for an economic unit, we use SMSAs when available. The relatively low levels of suburbanization during the pre-1940 period make us comfortable with our city level data in the years where SMSA-level

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[8] Atlanta in 1890 had many nearly-exclusively black areas. These areas were distributed throughout the city, however. Thus, at the ward level Atlanta appears to be very integrated but at a finer geographic unit the city is quite segregated. See Kellogg (1977) for discussion.

indices are impossible to construct.

Because segregation measures are most meaningful when the black population is sizable, we sample only cities or SMSAs with at least 1,000 blacks. Our sample size ranges from a low of 54 cities in 1900 to a high of 313 SMSAs in 1990.

Figures 1 and 2 show the indices of dissimilarity and isolation from 1890 to 1990, and Table 1 reports summary statistics for the two measures. We show three measures of segregation. The first measure, labeled "All Cities," is mean segregation using all cities with data that year. The second measure, labeled "Weighted" weights segregation in each city by the number of blacks that year, to reflect segregation for the typical urban black at the time. The third measure, labeled "Matched Sample," adjusts for the changing composition of cities over time. We form this index from decade-to-decade changes in segregation for cities that have data at both the beginning and end of a decade. We cumulate these changes, normalizing the index to the All City mean in 1990.

All of our indices tell a similar story. In each case, there is a tripartite division of segregation: from 1890 to 1940, segregation rose dramatically, to levels we think of as the modern ghetto; from 1940 to 1970, segregation expanded or leveled off; and after 1970, segregation declined.

The Birth of the Ghetto. In 1890, American cities were segregated but not exceptionally so. While blacks were disproportionately concentrated in particular parts of cities (dissimilarity was 49 percent), these areas were not entirely or even mainly black. The average black lived in a ward that was only 27 percent black, and isolation was only 21 percent. Accounts of cities at this time frequently highlight the interactions between blacks and whites in everyday life (Spear, 1968, Kusmer, 1976). The spatial proximity of the races distinguishes the city of 1890 from the city of today. While eleven cities had a dissimilarity index in the very high range (above .6) in 1890, only 1 city (Norfolk, VA) had blacks sufficiently isolated from

whites (above .3) to say that there was a ghetto.

Even in 1890, however, there was a clear regional and city size pattern to segregation, as shown in Figures 3 and 4. Large cities in the Northeast and Midwest were the most segregated (even though only 2.5 percent of their population on average was black). Smaller cities, and cities in the South and West, were less segregated. These regional and size patterns persist largely intact over the next century.

Particularly during and after World War I, blacks came to the North from the rural South in record numbers. In part, the migration of blacks was driven by agricultural changes such as the automatic cotton picker (Lemann, 1991). In part, migration was a result of heavy demand for labor in burgeoning industrial cities of the North, coupled with restrictions on immigration. And in part, the black communities of the North offered a more comfortable social milieu than the South of the Jim Crow era.[9] Between 1890 and 1940 the urban black population grew by about 4 percent annually in the Northeast and Midwest and about 2 percent annually in the South and West (see Table 2). For many Northern cities, this was the first experience with large black populations.

Segregation rose dramatically with the influx of Southern blacks, particularly in the industrial North. To look at the relation between the great migration north and the rise of segregation, we estimate regressions for the change in segregation across cities from 1910 to 1940[10] as a function of the increase in the black population between those years, the increase in the non-black population, a dummy variable for cities that had a high level of segregation to begin with, and that dummy variable interacted with the change in black population. We include the last two terms because one would expect segregation in cities that were initially

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[9] Drake and Cayton (1945) describe the social life in the mid-century "Bronzeville".

[10] We use data from 1910 because we have more cities in that year than in 1890. The results are similar using 1890 as the starting year.

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highly segregated to rise less rapidly and be less sensitive to changes in black population than cities that began less segregated. For the 59 cities for which we have data in both years, these regressions yield (standard errors in parentheses):

$$\Delta(Dissimilarity) = \underset{(.031)}{.087} + \underset{(.032)}{.081} \cdot \Delta \ln(Black) + \underset{(.050)}{.013} \cdot \Delta \ln(Non-Black) +$$

$$\underset{(.047)}{.034} \cdot HighSeg - \underset{(.041)}{.090} \cdot HighSeg \cdot \Delta \ln(Black); \quad R^2 = .149$$

$$\Delta(Isolation) = \underset{(.034)}{.020} + \underset{(.030)}{.116} \cdot \Delta \ln(Black) + \underset{(.060)}{.036} \cdot \Delta \ln(Non-Black) +$$

$$\underset{(.068)}{.136} \cdot HighSeg - \underset{(.049)}{.133} \cdot HighSeg \cdot \Delta \ln(Black); \quad R^2 = .245$$

Across cities, the growth of the ghetto is strongly and significantly related to the migration of blacks. A 4 percent annual increase in black population for a half century (roughly the observed level in the North) leads to a change in dissimilarity of 16 percent and a change in isolation of 20 percent. This is not just a growing city effect; growth of the non-black population is not significantly associated with increases in segregation.

Indeed, segregation rose dramatically between 1890 and 1940. In that period, dissimilarity rose by 20 percent (to 68 percent) and isolation increased by 15 percent (to 37 percent). For the first time, many cities saw the creation of entirely black areas. Where 1 city had a ghetto (dissimilarity above .6; isolation above .3) in 1890, 55 cities had a ghetto in 1940. This includes essentially all of the major industrial centers of the North. Segregation also increased in the South, although as we noted above, we have less confidence in this conclusion than we do for the rise of segregation in the North. To a great extent, the modern spatial distribution of races in American cities was established by 1940.

One might wonder whether there is an inherent tendency towards increasing segregation any time cities are expanding or political units are used to delineate areas. To examine this, Figure 5 shows the index of dissimilarity for the foreign born population from 1890 to 1940.[11] Segregation of the foreign born rose with rapid immigration, from 1890 to 1910, but then declined in the following decades. There does not appear to be an inherent tendency for segregation to rise over time. We thus conclude that the rise in segregation for blacks is a reflection of true changes in residential structure.

The Expanding Ghetto. The early post-World War II period witnessed the second wave of migration of blacks from the rural South to the North. The number of migrants in the 1950s and 1960s was even greater than the number after World War I; between 1940 and 1970, the growth of the black population was 4.7 percent annually in Northeastern and Midwestern cities and 4 percent annually in the South and West (Table 2).

The result was another large increase in segregation. Between 1940 and 1970, dissimilarity increased by 5 percent and isolation increased by 4 percent in the All City sample and 15 percent in the Matched Sample. As Figures 3 and 4 show, the increase in segregation is particularly great of the large industrial cities in the Northeast and Midwest. Large Southern cities also saw a dramatic increase in segregation in this period.[12]

A regression of changes in segregation between 1940 and 1970 (N=102), similar to the regression shown above for the earlier period, confirms the importance of continued migration in the expansion of the ghetto:

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[11] Cutler, Glaeser, and Vigdor (1997) examine segregation of the foreign born and assimilation of immigrants in more detail.

[12] The switch from ward to tract data in 1940 may be responsible for some of the observed increase in segregation in the South between 1930 and 1940. As discussed above, ward-based measures of segregation appear less reliable in the South.

$$\Delta(\textit{Dissimilarity}) \;=\; \frac{.085}{(.041)} + \frac{.052}{(.025)} \cdot \Delta\ln(\textit{Black}) + \frac{.038}{(.022)} \cdot \Delta\ln(\textit{Non-Black}) \;-$$

$$\frac{.068}{(.040)} \cdot \textit{HighSeg} - \frac{.048}{(.028)} \cdot \textit{HighSeg} \cdot \Delta\ln(\textit{Black}); \quad R^2 = .304$$

$$\Delta(\textit{Isolation}) \;=\; \frac{.025}{(.048)} + \frac{.121}{(.022)} \cdot \Delta\ln(\textit{Black}) - \frac{.010}{(.033)} \cdot \Delta\ln(\textit{Non-Black}) \;-$$

$$\frac{.029}{(.053)} \cdot \textit{HighSeg} - \frac{.017}{(.034)} \cdot \textit{HighSeg} \cdot \Delta\ln(\textit{Black}); \quad R^2 = .402$$

For both dissimilarity and isolation, increases in black population are associated with increases in segregation. Indeed, the coefficients are about the same magnitude as in the earlier period. There is again no effect of increases in the non-black population on segregation.

The dramatic clustering of blacks into tracts that were exclusively or nearly exclusively black is particularly striking in this period. Table 3 shows the distribution of census tracts in 1940 and 1960[13] by the percent of the tract that is black. For example, 21 percent of census tracts in 1940 had no blacks and 39 percent were between zero and one percent black. Between 1940 and 1960, the most remarkable change in racial distribution is the shift from tracts that were moderately black to tracts that were heavily black. The share of central city tracts that were less than 15 percent black fell, while the share of tracts that were 15 to 90 percent black increased by 4.4 percentage points and the share of tracts that were 90 percent or more black nearly doubled. Some of this increased concentration of blacks was a result of crowded cities, coupled with increased racial tension, that propelled whites to leave cities for suburbs (Massey and Denton, 1988a). As Table 3 shows, suburbs were much more likely to be exclusively or nearly exclusively white than were central cities.

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[13] We are not able to distinguish central city and suburban tracts in 1970 data, thus Table 3 presents data from 1960 instead.

By 1970, segregation in America had reached staggering levels. To achieve racial integration in the average city, almost 80 percent of the black population would have had to move to a different census tract, and the average black lived in a census tract that was 68 percent black. Isolation of blacks from whites was 41 percent. Using our measure of whether the city had a ghetto, 127 of 211 cities qualified.

The Declining Ghetto. Since 1970, there has been a decline in segregation. The decline is particularly pronounced in the major cities of the South and West, but segregation has fallen throughout the country. Between 1970 and 1990, dissimilarity fell by 13 percent and isolation fell by 15 percent. Only 98 of 313 cities in 1990 meet our definition of a ghetto.

Indeed, the process driving changes in segregation is different in the post-1970 period from the pre-1970 period. Using the same regression approach as before, we find (N=203):

$$\Delta(Dissimilarity) = -\frac{.055}{(.024)} - \frac{.007}{(.037)} \cdot \Delta\ln(Black) - \frac{.103}{(.023)} \cdot \Delta\ln(Non\text{-}Black) -$$

$$\frac{.042}{(.027)} \cdot HighSeg - \frac{.057}{(.040)} \cdot HighSeg \cdot \Delta\ln(Black); \quad R^2 = .285$$

$$\Delta(Isolation) = -\frac{.050}{(.017)} + \frac{.061}{(.025)} \cdot \Delta\ln(Black) - \frac{.146}{(.026)} \cdot \Delta\ln(Non\text{-}Black) -$$

$$\frac{.050}{(.021)} \cdot HighSeg - \frac{.073}{(.036)} \cdot HighSeg \cdot \Delta\ln(Black); \quad R^2 = .369$$

Increases in the black population are associated with increases in isolation but not in dissimilarity. And even for the isolation index, the coefficient on the increase in black population is half of its magnitude for the earlier periods. Thus, there is a substantially smaller effect of increases in the black population on segregation than in previous periods.

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Further, during the 1970 to 1990 period, more rapid increases in the non-black population are associated with a reduction in segregation; this is not true for the earlier periods.

One possible explanation for the changing relation between black migration and segregation is that the typical black migrant is much more likely to be moving from city to city than from rural area to city. The desire to live in predominantly black areas may thus be falling. Still, something fundamentally different is occurring where increases in the non-black population are leading to reductions in segregation. It may be that stagnant cities were caught in their historically high levels of segregation, but growing cities could adapt better to declining tastes for segregation.

Integration in the post-1970 period is to a large extent the elimination of areas of cities that were exclusively or nearly exclusively white. As Table 3 shows, between 1960 and 1990, the share of central city tracts that were less than 1 percent black fell from 55 percent to 18 percent and the share of suburban tracts that were less than 1 percent black fell from 70 percent to 40 percent. The share of tracts that were between 1 and 15 percent black, in contrast, rose. Interestingly, reduced segregation is *not* a product of the integration of all-black neighborhoods. The share of tracts that were at least 90 percent black doubled in both cities and suburbs.

One potential explanation for the post-1970 decline in segregation is the changing relation between blacks and immigrants. In the early decades of the 20th Century, blacks and recent European immigrants frequently clashed as the two groups often competed for space in crowded cities (Spear, 1968).[14] More recently, blacks and Hispanics have occupied similar neighborhoods in central cities. This change in black/immigrant relations might affect overall black segregation. The lower panel of Table 2 shows that these interactions cannot

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[14] In the typical American city at the turn of the century, both blacks and immigrants were highly segregated. Across cities in 1910, the correlation between black segregation and segregation of South and Central European immigrants was .413 (N=72).

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explain much of the patterns in segregation. Between 1890 and 1940, segregation between blacks and native whites rose by even more than segregation between blacks and the foreign born. And in the post-1970 period, segregation between blacks and native whites has fallen, just as it has between blacks and Hispanics. Other factors are clearly at work.

The decline in segregation after 1970 might also be a consequence of rising black education levels. More educated blacks are more integrated than less educated blacks, so that rising black education over time (Smith and Welch, 1989) could result in reductions in segregation. But this is not important quantitatively. Table 2 shows segregation by education group in 1970 and 1990. If segregation for each education group had stayed at its 1970 level, and all blacks had moved from having been a high school dropout in 1970 to having more than a high school education in 1990 (greater than the actual change), dissimilarity would have only fallen by .014. In actuality, segregation fell by more than 10 percent. Indeed, Table 2 shows that while segregation fell most for the most educated blacks, segregation fell for all blacks.

IV. Segregation Across Cities

The dramatic changes in segregation over time mask a basic fact about segregation suggested by Figures 3 and 4 -- the relative segregation of different cities is very stable over time. The lower panel of Table 1 shows the correlation of dissimilarity and isolation across cities at different time periods. Even a century apart, dissimilarity is correlated by 50 percent, and isolation is correlated by 14 percent. Over periods of 40 to 50 years, the correlations range between 30 and 90 percent.

Indeed, a comparison of the most segregated cities at different points in time is striking. Using the index of dissimilarity, Chicago was the most segregated city in 1890, the fourth most segregated city in 1940, the second most segregated SMSA in 1970 and the fourth most segregated MSA in 1990. Cleveland was the second most segregated city in 1890, the third most segregated city in 1940, the third most segregated SMSA in 1970 and the third most

segregated MSA in 1990. This constancy of segregation across cities is a key fact we return to below.

To understand the factors associated with differing levels of segregation in more detail, we estimate models relating segregation to several population characteristics: the logarithm of the city population; the logarithm of population density;[15] the share of the population that is black; and the share of the population that is foreign born or Hispanic.[16] We also include region dummy variables. City population and density seem natural to control for given the evidence in Figures 3 and 4. The ethnic composition of the population might be related to segregation because of changes in the desired living status of different groups over time.

Table 4 shows the results of these regressions. The first four columns relate the index of dissimilarity to each of these factors in 1910, 1940, 1970, and 1990. The latter four columns repeat the regressions, using the index of isolation as the dependent variable. There is clear evidence that larger or more dense cities have higher levels of segregation. In 1910, dissimilarity is related to city density although isolation is not. In 1940, 1970, and 1990, both measures of segregation are strongly related to population size. The coefficients are roughly the same for all three years although they are somewhat greater in the more recent years than in 1940. These coefficients are large. A one standard deviation increase in population increases dissimilarity by about 7 percent and isolation by about 12 percent.

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[15] We measure density as population per acre (before 1940) or square mile. It is not obvious that this is the right measure of density, since vacant areas of the city will reduce measured density but not affect the density of the areas in which people actually live. To examine the importance of this, in 1990 we formed an alternative measure of density, weighting the density in each tract in the city by the number of people living in that tract. Estimates with this measure were little different from estimates with a conventional measure of density, however, so we do not report these results.

[16] We use the population that is foreign born in 1910 and 1940 and the population that is hispanic in 1970 and 1990.

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The other independent variables are much less strongly related to segregation. In the later years of the sample, the share of the city that is black is positively related to isolation, although not to dissimilarity. The share of the population that is foreign born is generally unrelated to segregation, with the exception that in 1990 increases in the Hispanic population are associated with lower segregation. Over time, there are clear regional effects in segregation, but these are not true prior to 1970.

The dominant conclusion from Table 4 is that segregation is most persistently related to city size. Larger cities are more segregated than smaller cities, and this has been true for most of the last century. We take this as a basic fact about segregation that any model needs to explain.

Economic models of segregation predict greater integration when the "costs" of segregation are high. To test this, we relate segregation to three proxies for the cost of segregation, based on the ability of people to move within cities. The first measure is the extent of streetcar use in the city in 1902, taken from a Census of Transportation at the time (see the Data Appendix for a detailed description); in cities with more streetcar use, the ability to segregate should be greater. The second measure of the cost of segregation is the share of blacks working as domestic servants in the city in 1910; when more blacks work as domestic servants, the demand among whites to have blacks living near them should be greater (Leiberson, 1980). We relate each of these variables to segregation in 1910. The third measure is the extent of highway development in the state between 1950 and 1960; in the post-World War II period, highways replaced streetcars as the way to escape the central city. We relate segregation in 1970 to highway construction in the 1950s.

Table 5 shows the relation between segregation and the mobility cost measures, using the same framework as in Table 4. We present these estimates separately from those in Table 4 because the cost data are not available for every city, and we wanted the widest set of cities possible for our earlier regressions. None of our measures of the cost of segregation confirm

our expectations. Trolley car passengers and highway miles, for example, are insignificantly related to segregation. And in cities where there are more domestic servants, segregation is higher -- opposite from the predicted sign. This result may reflect unobserved differences across cities, such as variation in racism or racial income disparities, that correlate with the employment of blacks as domestic servants.

Overall, we thus find a strong positive relation between city size or density and segregation, but little evidence that transportation costs affect segregation. We take the relation between segregation and city size as a basic fact that models of segregation need to explain.

V. Theories of Segregation

Having established a set of basic facts about segregation over the past century, we turn now to possible explanations for these phenomena. We divide the potential explanations for segregation into three groups.

Ports of Entry

One explanation for segregation is that ghettos are a mechanism to help a group assimilate into a new environment. Immigrant ghettos are frequently depicted as areas that helped guide the transition from foreign countries to life in the United States (Glazer and Moynihan, 1963, Gans, 1958). While there are many differences between the black and the immigrant experience, contemporaneous accounts of black migration from the South to the North are often reminiscent of this role: Spear (1968) discusses how the Chicago ghetto network helped new migrants find jobs; and Drake and Cayton (1945) highlight the comfortable social atmosphere (food, religion, friends and jobs) for black migrants.

Tastes for living among members of one's ethnic group are likely to be particularly strong for recent migrants. The port of entry theory is thus consistent with the rise in segregation

associated with black and immigrant migration. Further, in larger or more dense cities, it will be easier to form all black areas than in smaller cities, where the displacement of whites would be greater. Thus, this theory could also explain the relation between city size and segregation.

Indeed, evidence for the post-1970 period from the General Social Survey (GSS) suggests some desire for segregation among recent black migrants: black migrants from the South are 10 percent more likely to belong to an all-black church than native Northern blacks and 24 percent more likely to prefer a segregated neighborhood than their northern counterparts.[17]

The port of entry theory offers several other testable predictions. First, it predicts that the desire for segregation should be particularly high among blacks living in more segregated cities, and especially among new migrants in those cities. Second, blacks (again disproportionately new migrants) should pay a rental premium to live in more segregated areas, reflecting their stronger tastes for living with other blacks. We examine these predictions below.

Collective Action Racism

A second theory is that ghettos are a result of collective actions taken by whites to live apart from blacks. Collective action can take different forms: specific policy instruments such as racial zoning or restrictive covenants that exclude blacks from particular areas; or organized activities such as threatened lynching or fire bombing that discourage blacks from moving into white neighborhoods.

These types of collective actions were an important part of urban history. Clark and Perlman (1948) estimate that 80 percent of the deeds in some areas had restrictive covenants. Weaver

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[17] The t-statistics of these differences are 7.1 and 5.0, respectively. These results are robust to controlling for age and education.

(1948) and Massey and Denton (1993) argue that these covenants, and other explicit legal barriers, created segregation. Indeed, barriers to integrated housing in the North arose with the large black in-migration, perhaps because migration sparked racial tension.[18] Racism might also be greater in denser or more populated cities, where the frequency of cross-racial contact will be greater and where crowding may breed more discontent.

Using data from Monchow (1928), we are able to partially look at the relation between segregation and the share of deeds in a city with restrictive covenants. Monchow examines a sample of 51 deeds written between 1908 and 1928 from cities for which we have 1940 segregation data. Table 6 shows how the share of deeds with restrictive covenants varies with segregation in the city. We split cities into two groups: highly segregated cities (the upper part of the Table) and less segregated cities (the lower part of the Table). Restrictive covenants were more common in more segregated cities than in less segregated cities. Two-thirds of the covenants from the highly segregated cities contained resale restrictions, compared with only 50 percent of covenants from less segregated cities (t-statistic = 2.57). This suggests that this type of restriction may have been important in enforcing segregation.

Beyond attempting to quantify these restrictions (we know of no widescale research on thipc topic), this theory has several testable implications. First, white attitudes towards integration should be less favorable in cities that are more segregated. Second, blacks should pay more for housing than whites in more segregated cities, since blacks are artificially constrained from moving into white areas (as in Kain and Quigley, 1975).

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[18] This may be because blacks now competed with whites in the labor market (blacks were often used as striker replacements) or because there are fixed costs to erecting barriers to integration and these instruments only make sense when the black population reaches a certain scale.

The third theory is that ghettos are maintained by racism on the part of whites, but that segregation is enforced by individual decisions on the part of whites to live with other whites as opposed to collective action excluding blacks. This type of model is a variant of the "tipping" model introduced by Schelling (1972) and described in detail in the Theory Appendix: because whites are willing to pay more than blacks to live in predominantly white neighborhoods, eventually all neighborhoods become completely segregated even if most people would prefer modest degrees of integration.

Legally most of the formal barriers to integration have been eradicated. Restrictive covenants were made unenforceable by the Supreme Court in 1948. Government agencies that directly or indirectly aided segregation[19] stopped doing so. This might explain why segregation has declined since 1970. But underlying racist views may not have changed as much. Thus, segregation may still persist at high levels, even with no collective enforcement mechanism.

This model has several testable implications. First, as in the collective action theory, segregation should be related to white views about integration. Second, segregation should require differences in house prices by race. But importantly, the decentralized racism theory suggests that whites should pay more than blacks for equivalent housing, as the cost of restricting their housing to segregated neighborhoods. This prediction is the opposite of the collective action theory.

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[19] For many years, the Federal Housing Administration used neighborhood racial composition explicitly as a criterion for underwriting mortgage loans. Areas with large black populations were systematically "redlined."

Summary

Our theories about ghettos offer several different predictions, summarized in the Table below. A first prediction concerns housing costs in more segregated cities compared to less segregated cities. In the port of entry theory and collective action racism theory, blacks should pay relatively more for housing than whites in more segregated cities, to reflect black desires to live in segregated areas. In the port of entry theory, this should be particularly true among recent migrants. In the decentralized racism theory, in contrast, whites should pay more for housing than blacks. A second prediction concerns attitudes towards integration. In the port of entry theory, blacks should favor less integration in more segregated cities; in either of the two racism theories, whites should favor less integration in more segregated cities.

Predictions of Alternative Theories

Relation between Segregation and:	Theory		
	Port of Entry	Collective Action	Decentralized Racism
House Prices	Blacks pay more (esp. new migrants)	Blacks pay more	Whites pay more
Attitudes towards integration	Blacks prefer segregation (esp. new migrants)	Whites prefer segregation	Whites prefer segregation

By examining these predictions empirically, we can differentiate among these three theories. In the next sections, we conduct this empirical analysis. We begin with a set of case studies on segregation in different cities.

VI. Case Studies: Cleveland, Atlanta, Sacramento

Before turning to formal empirical tests of these theories, we consider three case studies of segregation in particular cities. By focusing on individual cities, we can know much more about the details of political and economic life within a specific area. In addition, we can match census tracts over time to investigate the dynamics of fixed neighborhoods.

For our case studies, we chose cities that are representative of the urban experience over the past century. Our first city, Cleveland, is a typical Midwestern city, with a ghetto born of black migration in the post-World War I period. Cleveland is one of the most segregated cities in the nation today. Our second city, Atlanta, is a Southern capital that has historically been segregated but has seen segregation fall substantially in the past two decades. Our third city, Sacramento, is a rapidly-growing Western city that has never experienced the segregation of Cleveland or Atlanta, despite having equally rapid increases in the black population.

For each city, we gathered census tract information for as many years as it was available -- beginning in 1910 for Cleveland,[20] 1940 for Atlanta, and 1950 for Sacramento. We then matched tracts over time, adjusting for merging, shifting, and separating tracts, so that our historical series of segregation is a constant set of physical units (see the Data Appendix for details). Thus, changes in segregation for these cities are not a result of artificial changes in the subunit divisions within the city.

Cleveland

Our first city is Cleveland. A good deal is known about segregation in Cleveland, thanks to historical research of Kusmer (1976), Moore (1953), Wye (1973), and Galster (1990) among

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[20] For a few cities, census tract data have been constructed prior to 1940. Cleveland is one of the few cities with available data.

others. Cleveland had a very small black population in 1910. As the upper part of Table 7 shows, only 2 percent of Cleveland was black in 1910. While blacks in Cleveland were disproportionately concentrated in certain parts of the city (the index of dissimilarity was 66 percent), these areas were not primarily black (the index of isolation was only 8 percent). Indeed, the largest area of black concentration in 1910 was in an area of the city populated primarily by Russian and Italian immigrants.

Kusmer argues that Cleveland experienced a relatively golden age of black-white relations prior to 1920: public schools and hospitals were integrated, as were colleges such as Oberlin and Western Reserve. This also fits the description of cities such as Philadelphia (see DuBois, 1899) or Chicago (Spear, 1968) at the same time.

Cleveland boomed during and after World War I, attracting (and actively recruiting) a large number of blacks from the rural South. In the thirty years after 1910, Cleveland's black population grew by nearly 8 percent annually, to reach 10 percent of the total population in 1940. Southern blacks were relatively illiterate and unskilled; when they moved to Cleveland, they took up residence in predominantly black areas. Further, racial tensions increased with the growth of the black population. After 1910, segregated facilities became common. The institutional framework that would support collective active racism was firmly established by 1920 (Kusmer, 1976).

There was a massive increase in segregation at this time. By 1940, dissimilarity in Cleveland was 84 percent and isolation was 63 percent. In 1910, Cleveland did not have a ghetto in the modern sense, by 1940 it did. Some combination of black desire for living in segregated areas and collective action on the part of whites seems responsible for the birth of the ghetto.

Figure 6 shows graphically how the ghetto in Cleveland developed, and the lower panel of Table 7 provides descriptive evidence. The solid black areas in the Figure -- East of the Cuyahoga river between Euclid and Woodland Avenues -- are census tracts which were at

least 75 percent black in 1940. None of these tracts were more than 25 percent black in 1910.[21] The lower panel of Table 7 shows characteristics of tracts that became 25 percent black in this period. There is a stunning degree of segregation associated with racial change. Fifteen tracts reached the 25 percent black mark between 1910 and 1940. By two decades later, 10 of these tracts were over 75 percent black. These areas are still at the heart of black Cleveland today, and average 92 percent black in 1990.

Between 1940 and 1970, blacks continued to move to Cleveland, and Cleveland's black population increased by 4.5 percent annually. Segregation increased modestly in this period. But the most striking fact about Cleveland between 1940 and 1970 was the expansion of the black ghetto. Between 1940 and 1970, 28 census tracts in the city of Cleveland reached 25 percent black. By two decades later, 27 of these tracts were over 75 percent black. As Figure 6 shows, by 1970 the black ghetto encompassed a region extending from Lake Erie to the suburban communities of Shaker Heights and Garfield Heights, extending westward to the Cuyahoga river, the historical dividing line between black and white Cleveland.[22]

Since 1970, segregation in Cleveland has fallen. Of the 12 city tracts that reached 25 percent black between 1960 and 1970, one-third were less than 75 percent black as of 1990. And while some immediate suburbs of Cleveland, including East Cleveland and Cleveland Heights, have become predominantly black, other suburban communities are more racially mixed. The powerful legal apparatus that kept much of the city 100 percent white prior to 1950 seems to have eroded by 1990.

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[21] Kusmer (1976) presents occupational evidence showing that as the ghetto developed more skilled blacks moved to the tracts away from the central ghetto, perhaps because these people sought more contact with long-term residents than with recent migrants.

[22] Much of the area of Southeastern Cleveland depicted as reaching 75 percent black by 1990 had actually reached this level by 1970. Because of extensive change in tract boundaries, data for 16 tracts in this area have been combined in the matching process.

Suburbanization has also moderated segregation. Only half of the suburban census tracts that reached 25 percent black in the post-World War II period were over 75 percent black within two decades, so the move of blacks to the suburbs has decreased segregation somewhat (as in Kain, 1985, or Clark, 1979). Table 8 shows that segregation in the suburbs is lower than segregation in the central city as of 1990, although both areas are still extremely segregated. The difference between central city segregation and suburban segregation declines if we use block groups (which are smaller units of approximately 1,500 individuals). This decline suggests that the lower segregation in the suburbs may be somewhat a reflection of greater heterogeneity within tracts in suburban areas.

Atlanta

Our second city is Atlanta. The first significant black settlement in Atlanta took place during Reconstruction. Attracted to the city by work opportunities and the presence of federal troops, the black population of Atlanta increased eight-fold between 1860 and 1880. The black migrants settled in a series of "clusters" around the city's periphery (Kellogg, 1977). These patterns of settlement can still be seen today, in the arrangement of predominantly black areas around Atlanta's central business district (see Figure 7).

Atlanta's civic leaders made many attempts to legally enforce residential segregation, particularly after the bloody riot of September 22, 1906 (Crowe, 1969). The city explicitly zoned by race in 1913 and 1916; these laws were deemed unconstitutional in 1917. Another attempt at racial zoning was passed in 1922 and again declared unconstitutional. In 1929, the city took a different track: it passed a law forbidding anyone (of either race) from moving into a house on a street where "the majority of the residences ... are occupied by those with whom said person is forbidden to intermarry" (from Bayor, 1996). This legislation was also deemed unconstitutional. Failing at attempts to zone by race, the city undertook programs of highway development, public housing construction, and slum clearance that displaced many blacks and steered many others to already crowded black areas. During the urban

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renewal period of the 1950s and 1960s, critics accused local officials of pursuing a policy of "Negro removal" in their attempts to revitalize the central business district (Bayor, 1989). Even more than Cleveland, Atlanta's history is one of collective enforcement by whites of racial barriers.

To a large extent, Atlanta's attempts to promote racial separation appear successful. In 1940, the first year that census tract data is available, segregation in Atlanta approached the level of Cleveland, and Atlanta was the most segregated of 16 Southern cities according to both the dissimilarity and isolation indices. This pattern continued in the 1940s, 1950s, and 1960s, when many tracts became nearly all black, and the black ghetto spread from downtown to the South and West towards the suburban areas of East Point and Forest Park. As Table 7 shows, of the 44 tracts that became 25 percent black between 1940 and 1970, 35 tracts were at least 75 percent black within two decades.

Atlanta experienced a striking fall in segregation after 1970. Between 1970 and 1990, dissimilarity fell by 13 percent and isolation fell by 15 percent. Black suburbanization is responsible for much of the decrease. Between 1970 and 1990, the share of blacks living in the suburbs of Atlanta increased from 36 to 56 percent. While some suburbs near the city (such as the Candler-McAfee and Panthersville areas of DeKalb county) have become nearly entirely black, others areas such as North Atlanta and Marietta appear to be maintaining stable communities at or around the metropolitan average of 25 percent black. Figure 7 shows areas that have maintained a moderate black share for at least 20 years.

Additionally, blacks have been making inroads into previously white areas, particularly the suburban areas to the city's North (the area from Stone Mountain in the East to Powder Springs in the West). Of the 26 matched census tracts in the metropolitan area that were less than one percent black in 1970, only 6 remained under 5 percent black in 1990. Seventeen of these tracts were between 5 and 30 percent black. Atlanta had its first black mayor in 1973 and the political system of the city stopped supporting collective action racism. The

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decline of formal methods of segregation may have allowed the increase in integrated areas.

Table 8 shows segregation in the central city and suburbs of Atlanta. The difference in segregation is striking; segregation in the city is over 20 percentage points greater than segregation in the suburbs. Using block group indices, the difference in segregation levels declines somewhat but is still large. Thus, Atlanta offers some evidence that racial integration may be possible, especially in suburban areas, with the decline of all-white areas.

Sacramento

Our third city, Sacramento, is much less studied for its racial features than for its ethnic composition (it has a large share of Asian immigrants). Still, the black population of Sacramento has grown substantially in the post-World War II period, averaging 7.5 percent per year between 1950 and 1990. This is comparable to peak growth rates in Cleveland or Atlanta.

In 1950, the distribution of Sacramento's black population closely resembled that of Cleveland in 1910. Over half of the city's blacks lived in an area of town known as the "West End," referred to by one author as "one of the worst slums in the nation." (Leland, 1989). The tracts comprising the West End are shown in black in Figure 8. This spatial distribution implies a high level of dissimilarity (56 percent). But blacks were not isolated in this neighborhood; the maximum census tract was less than 25 percent black. Indeed, the index of isolation was very low (11 percent). The area the blacks inhabited was largely Japanese.

Between 1950 and 1970, the West End was altered substantially by urban renewal projects and the construction of Interstate 5. By 1970, fewer than 2 percent of Sacramento County's blacks lived in the area. The black population dispersed to areas on the city's North and South sides that were each more black than was the West End (see Figure 8). As a result,

dissimilarity and isolation rose somewhat from 1950 to 1970, although isolation in particular was still relatively low. As with the other cities, formal or informal public policy decisions were instrumental in increasing segregation.

Surprisingly, Sacramento escaped the tendency seen in other cities to form completely black enclaves. As Table 7 shows, none of the tracts that became 25 percent black between 1950 and 1970 went on to become 75 percent black. In fact, each of these tracts declined in black share in the subsequent 20 years.

Between 1970 and 1990, segregation fell substantially. Dissimilarity declined by 14 percent and isolation fell by 6 percent. Two factors were at work. First, the tracts in which blacks were concentrated in 1970 became less black over time. At the same time, many of the tracts that were essentially entirely white in 1970 had a moderate (5 to 15 percent) share of blacks in 1990. By 1990, as Figure 8 shows, Sacramento's black population had spread relatively evenly through the metropolitan area. This process of black diffusion into formerly all-white areas resembles Atlanta's recent experience, except for the fact that Sacramento's suburbs are slightly more segregated than the central city itself (see Table 8). But the breakdown of all white areas is important in reducing segregation.

Lessons from the Case Studies

While not definitive, our comparison of three representative cities provides support for all of our theories. In Cleveland, segregation was driven by the growth of the black population — although the relative contribution of desires for segregation on the part of blacks and fear of integration on the part of whites in increasing segregation is unclear. It is clear that collective action has a substantial role in the formation of the ghetto. Legal or quasi-legal mechanisms were central to the growth of the ghetto in Atlanta and Sacramento, and likely in Cleveland as well. Finally, all three cities show the consequences of the reduction in barriers to integration. In each of the cities, blacks have moved into previously all-white

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areas in the past two decades, often resulting in a large reduction in segregation.

VII. Understanding Segregation

In this section, we look more formally at the explanations for changes in segregation using our cross-city data. We consider first the predictions for housing prices and then attitudes towards integration.

Evidence on Housing Costs

If blacks live separately from whites because they want to live among other blacks — for either cultural reasons or because of collective actions taken by whites — then blacks should pay more for housing than whites. If blacks live separately from whites because whites choose to live with each other, however, whites will pay more for housing in more segregated cities. Housing price evidence thus allows us to distinguish among some of the theories. This type of test was used by Kain and Quigley (1975), for example, to examine the extent of discrimination in the St. Louis metropolitan housing market.

We examine house price differences using data from the Integrated Public Use Microdata Samples of the Census (IPUMS). While the Census asks about house prices for owners, these data are not always believed to be reliable (Goodman and Ittner, 1992); we instead use data on rental costs for renter households. For 1940, 1970, and 1990 (no data exist prior to 1940), we estimate regressions of the form:

$$\ln(Gross\ Rent) = \alpha + \beta_1(Household\ Chars) + \beta_2(Structural\ Chars) +$$
$$\beta_3 \cdot Black + \beta_4 \cdot Dissimilarity + \beta_5 \cdot Dissimilarity \cdot Black$$

The coefficient β_4 gives the effect of segregation on rents for whites; β_5 is the differential

effect for blacks relative to whites. Our theories concern the sign of β_5; the port of entry and centralized racism theory predict $\beta_5>0$; the decentralized racism theory predicts $\beta_5<0$. Our household characteristics include age, gender, martial status, size of the household, and income. The structural characteristics, which are only available for 1970 on, include categorical variables for the age of the structure and type of building.

We include all renter households reporting a monthly payment greater than zero for the particular year.[23] The samples range from 53,368 in 1940 to 162,809 in 1990.

Table 9 shows the results of these regressions. The upper panel reports results without city fixed effects; the lower panel includes city fixed effects.[24] The first column shows results for 1940. While on average blacks pay less for housing than whites (140 percent less, based on the coefficient on black head of household), as the city becomes more segregated the relative rental payment for blacks increases compared to whites. The coefficient on the interaction term between black head of household and segregation is positive (1.4) and statistically significant. This coefficient is large; it suggests that in cities where blacks and whites are perfectly segregated, black and white rental payments will be essentially equal. This result is also true when we include city fixed effects, as the lower panel shows.

This result is consistent with many of the histories of ghettos at this time. Osofsky (1967) describes the large profits earned by the real estate entrepreneurs in Harlem (e.g. Philip Payton) who allocated certain buildings specifically to blacks and found that blacks were

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[23] The number of households reporting zero rent ranges from 64 in 1940 to 8,199 in 1970 and 9,520 in 1990. Rent is topcoded at $1,500 in 1990. We include a dummy variable indicating topcoded rent in regressions for that year. Excluding the topcoded observations does not influence the results; approximately 500 out of 160,000 households are affected. In 1970 and 1990, we use gross rent, which includes payments for utilities in units where the resident is responsible for these costs. Gross rent is not available in 1940.

[24] The standard errors in the upper panel have been adjusted to account for correlation within metropolitan area.

willing to pay more than their white counterparts for these apartments. Access to particularly high quality rental housing seems to have been quite restricted for most blacks before the 1960s.

The fact that black rents increased with segregation in the city strongly supports both the port of entry theory and the collective action racism theory. One way to differentiate between these two theories is to examine how the segregation effect differs for new migrants relative to older city residents. If ghettos are useful as a port of entry, then recent migrants should pay disproportionately more to live in more segregated cities. If ghettos reflect racism on the part of whites, then all blacks should pay more in more segregated cities. We test this in the second column by further interacting the segregation variables with a dummy variable for whether the individual is a migrant — which we define as a person born in a different state from their current residence:

$$\ln(Gross\ Rent) = \alpha + \beta_1(Household\ Chars) + \beta_2(Structural\ Chars) +$$

$$\beta_3 \cdot Black + \beta_4 \cdot Dissimilarity + \beta_5 \cdot Dissimilarity \cdot Black +$$

$$\beta_6 \cdot Migrant + \beta_7 \cdot Migrant \cdot Dissimilarity + \beta_8 \cdot Black \cdot Migrant +$$

$$\beta_9 \cdot Black \cdot Migrant \cdot Dissimilarity$$

In this equation, β_5 is the effect of segregation on rents for non-migrants, and β_9 is the effect of segregation on rents for migrants. The port of entry hypothesis predicts $\beta_9 > 0$; the collective action racism theory predicts $\beta_9 = 0$.

The results of this regression are reported in the second column of the Table. We find no difference in the effect of segregation on migrant and non-migrant blacks. The coefficient β_9 is small (-.09) and statistically insignificant. Overall, the data thus suggest that segregation in 1940 is due to collective action racism on the part of whites rather than the

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desire for living in black areas on the part of blacks. While this result is quite strong, we do note the uncertainty associated with the use of 1940 data. It may be that the earliest ghettos were formed as a result of black demands for housing in black areas, and that over time these ghettos were maintained by whites who came to dislike blacks. By 1940, segregation may be a result of collective action on the part of whites even if other theories were important earlier in the century. We have no way of testing this hypothesis, however.

The third column of Table 9 repeats the specification in the first column, using data for 1970. The coefficient β_5 is only one-third as large in 1970 as it was in 1940 and is not statistically significant. In the fixed effects regressions, the coefficient is only one-fifth as large. Since we have data on the structural characteristics of the house in 1970, we can include this information to see how it affects our conclusions about segregation. In the fourth column, we include these structural controls. Adding these controls to our regressions does not substantially change the results. The coefficients suggest a somewhat larger effect of segregation on relative rents for blacks compared to whites, but we cannot reject the hypothesis that the coefficient on the interaction term is the same with and without the structural characteristics. In both cases, the estimate is substantially below that for 1940. Our data thus suggest that collective action on the part of whites was less important in 1970 than it was in 1940. This is true even though segregation rose substantially over that 30 year period.

The final columns report results for housing rents in 1990, analogous to the regressions for 1970. By 1990, there is a striking reversal in the coefficients. In the regressions without fixed effects, we find no effect of segregation on the rents of blacks compared to whites; in the fixed effect estimates, we find that blacks pay *less* than whites for housing in more segregated cities. This is the prediction from the decentralized racism model.

Our evidence on housing rents thus yields a striking conclusion. In mid-century, blacks and whites were segregated because of collective action on the part of whites: restrictive housing

covenants and explicit or implicit threats of violence by whites towards blacks. Over the next 30, and particularly 50 years, collective action became less important. But racism was not eliminated. By 1990, differences in residential location between blacks and whites appear to be due to white desires to live in white neighborhoods more than black desires to live in those neighborhoods. Those differences explain the still rather high level of segregation in the United States.

Evidence on Attitudes Towards Integration

A second way to differentiate among our theories is to use information on attitudes towards integration. The port of entry theory suggests that blacks should want less integration in more segregated cities. The racism theories suggest that whites should prefer less integration in more segregated cities.

Ideally, we would use public opinion data over the past century to examine these predictions. Surveys on attitudes about integration have only been conducted since the early 1970s, however, in the General Social Survey. We therefore use data from 1972 through the present to examine these issues.[25] While not definitive, the survey evidence can provide us with helpful clues about the relation between attitudes towards integration and segregation in the modern era.

To examine the attitude of blacks towards living in integrated areas, we use a question the GSS asked blacks in 1982: "If you could find the housing that you would want and like, would you rather live in a neighborhood that is all black; mostly black; half black, half white; or mostly white?" On average, 67 percent of blacks chose either the third or fourth option. We estimate a linear probability model for blacks preferring to live in a half-white or mostly

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[25] Clearly, views about stated preferences towards integration must be viewed warily. Cross-city comparisons of attitudes towards integration may be more informative than average views in the survey, however.

white ("integrated") neighborhood as a function of segregation in the city. We also control for region, education, sex and age.

The first column of Table 10 shows estimates of this equation. There is no relation between segregation and the attitude of blacks towards integration. Indeed, the coefficient is positive (counter to the Port of Entry theory), although not statistically significant.[26]

The analogue to black views about integration is white views about integration. If the racism hypothesis is correct, whites in more segregated cities should prefer less integration than whites in less segregated cities. The remaining columns of Table 10 show results for three questions about white attitudes towards integration. The first question, asked over the entire time period inquired whether respondents believed "White people have a right to keep blacks out of their neighborhoods if they want to, and blacks should respect that right." On average, 24 percent of whites believe in the right to segregated housing. As the second column shows, whites in more segregated cities are more likely to believe in segregated housing. The coefficient suggests that a one standard deviation increase in segregation (.129) is associated with 2.6 percent increase in the share of the white population believing in the right to racially segregated housing.

A stronger test of the theory is whether changes in segregation are associated with changes in discriminatory tastes. Specifically, we estimate a model of the form:

$$Approves\ Segregated\ Housing = \alpha + \beta_1(Individual\ Chars) + \beta_2 \cdot Time +$$

$$\beta_3 \cdot Dissimilarity + \beta_4 \cdot \Delta Dissimilarity + \beta_5 \cdot \Delta Dissimilarity \cdot Time$$

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[26] If we look at south-north migrants, we do find that these migrants are more likely not to prefer integration. But even within this sample of migrants, we also fail to find a significant negative correlation between segregation and preferring integrated neighborhoods.

The coefficient β_5 indicates whether approval of segregated housing has declined more rapidly in cities where segregation has fallen more rapidly. The third column reports estimates of this equation. The results show that while there is a significant decline in the answer to this question over time (the coefficient on the time trend is -1 percent per year), there is no correlation between the decline in segregation and the change in attitudes across cities. We interpret this negative result as suggesting that declines in segregation have more to do with changes in legal barriers and discriminatory institutions than with any deep change of heart among the white population.

The fourth column looks at a related question — "Do you think there should be laws against marriages between blacks and whites?" On average, 22 percent of white respondents indicated support of such laws. The relation between this variable and segregation is quite different, however. In more segregated cities, whites are less likely to support a ban on interracial marriage than are whites in less segregated cities. This is opposite to the predictions of the racism theory.

The final column examines a question asked in 1990 only — respondents were asked their support to "living in a neighborhood where half of your neighbors were blacks". Forty-six percent of white respondents registered opposition. In more segregated cities, whites are more likely to oppose living in a majority black neighborhood, and the coefficient is larger quantitatively than in the previous regressions, although it is not statistically significant.

The survey data thus presents mixed evidence. There is no relation between stated black preferences for segregation and observed levels of segregation, which suggests that at least in the modern era, segregation is not driven by black tastes for integration. There is a positive relation between segregation and some white attitudes towards segregation, but this is not true for all characteristics of integration. Thus, the evidence suggests some relation between segregation and white attitudes towards integration, confirming the racism theories, but this explanation clearly cannot account for all of the cross-section or time-series profile

to segregation. It may be that segregation across cities is still adjusting to the levels consistent with the absence of formal barriers to integration.

VIII. Conclusion

Our examination of segregation in the past century leaves us with two conclusions. First, the history of segregation in urban America is nearly a century of continuous increase, followed by a modest decline. Segregation in the United States rose continuously from 1890 to 1970 -- a period where ghettos were first born, and then cemented themselves in urban life. From 1970 to 1990, segregation has been falling. Second, despite these large changes in segregation over time, segregation across cities is very persistent, and is strongly related to city size. Larger cities have much higher levels of segregation than smaller cities, and this has been true for most of the last century.

We find clear evidence that in mid-20th century, segregation reflected collective actions on the part of whites opposing integration, as opposed to desire for segregation on the part of blacks new to urban America. Restrictive covenants, explicit or implicit threats of violence, and generally adverse social conditions kept blacks out of white areas. Black areas of cities were crowded, and blacks paid more for housing than whites paid in equivalent areas. Over time, formal barriers to integration were eliminated, but discriminatory white tastes remained. Whites still prefer to live with other whites more than blacks prefer to live in white areas. Decentralized racism operating through the price mechanism has replaced centralized, legally enforced racism, and racial differences in housing still persist.

The implications of these results for the future are mixed. Segregation has declined over the past 20 years, and this may be related to the elimination of formal barriers to integration. Indeed, the decline in segregation occurred mainly because formerly all white areas now have small numbers of black residents, which is strongly suggestive of a lowering of walls against black mobility. But there are more completely black areas in our cities than there ever have

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been in the past and large amounts of segregation linger. Possibly, large reductions in segregation will have to await greater change in attitudes towards racial integration than we have experienced in the recent past.

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Figure 1: Index of Dissimilarity, 1890-1990
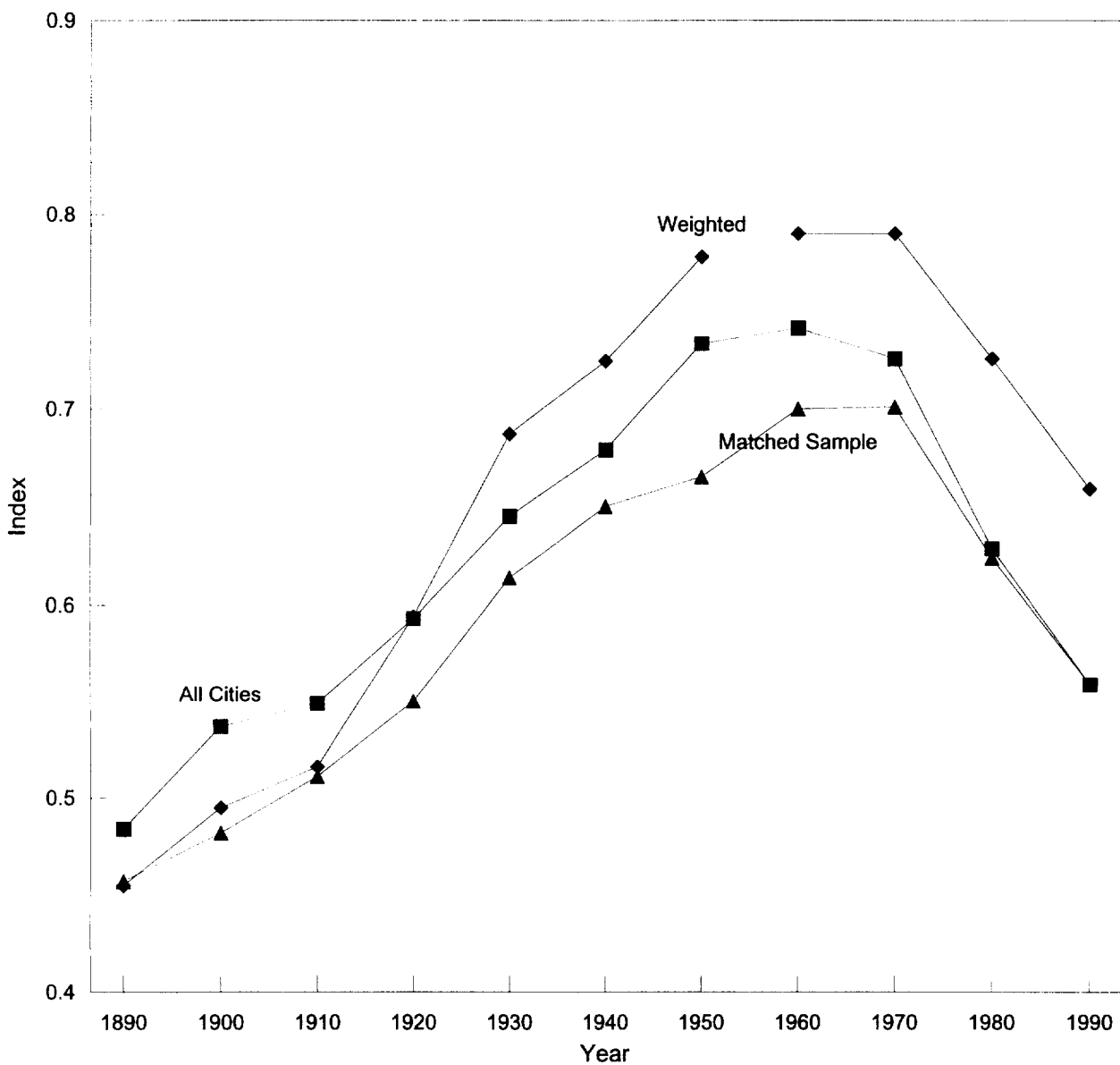
Note: Matched sample segregation is normalized to unmatched mean in 1990.

Figure 2: Index of Isolation, 1890-1990
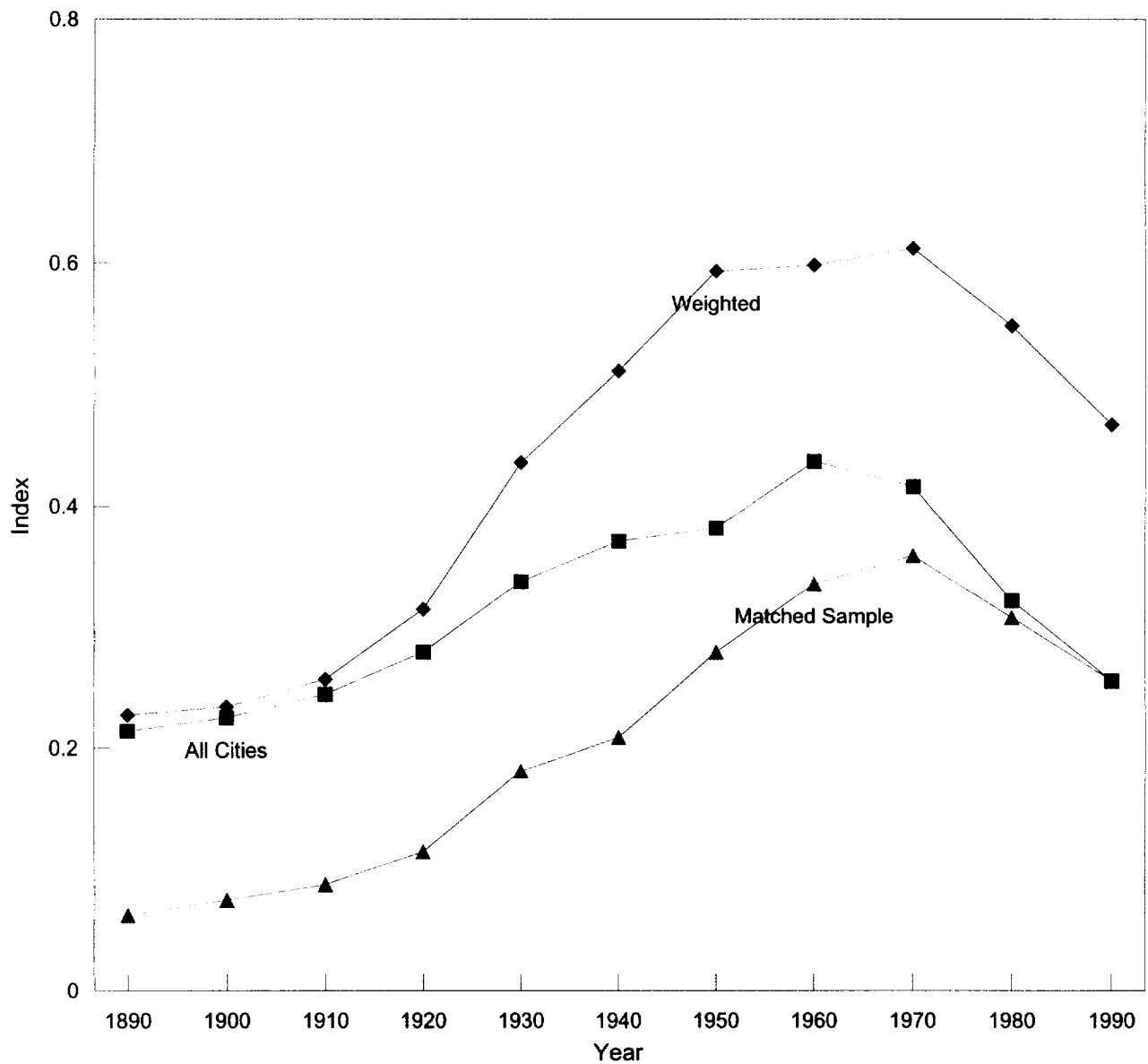
Note: Matched sample mean is normalized to unmatched mean in 1990.

Figure 3: Dissimilarity by Region and City Size
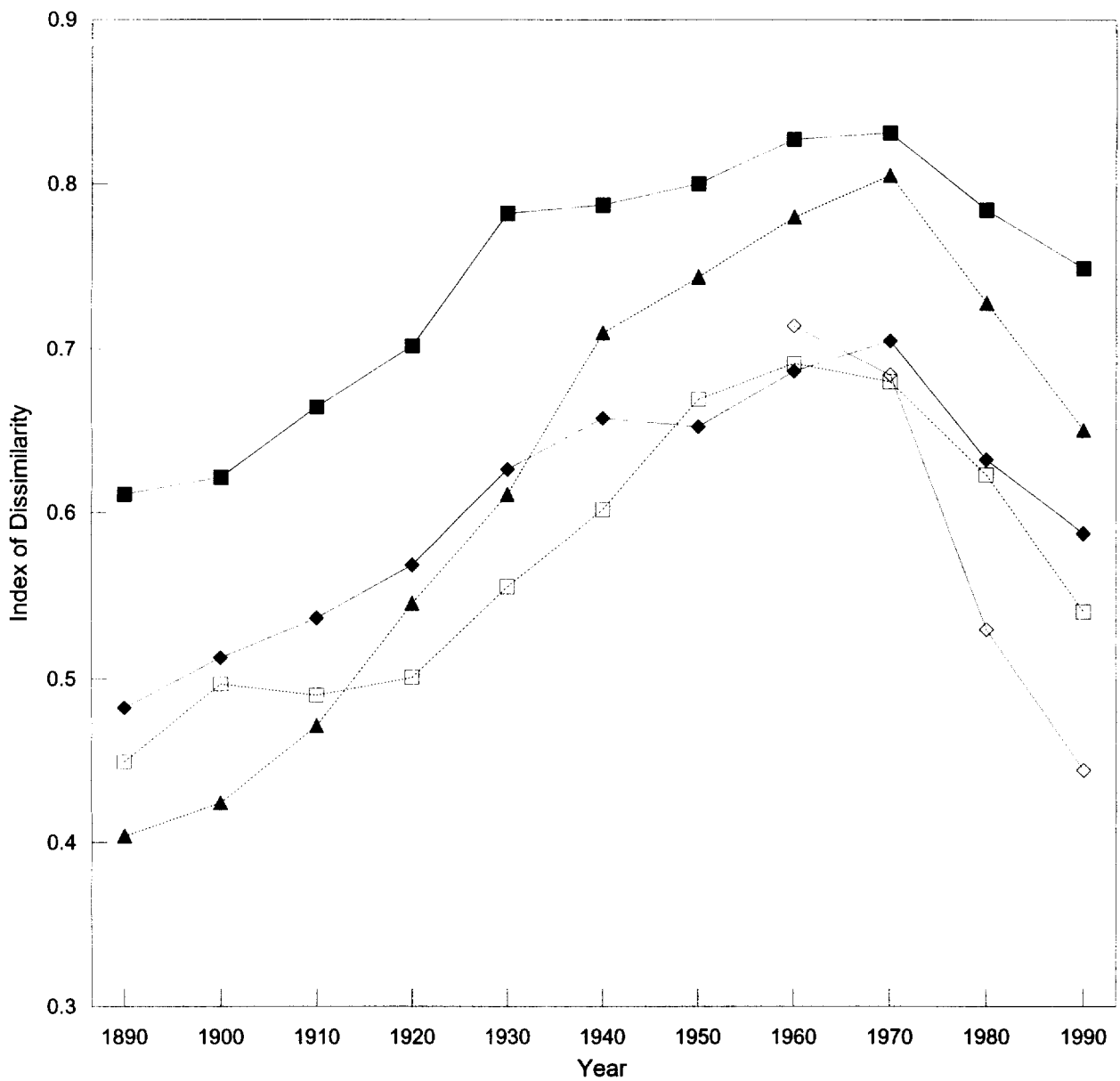
Figure 4: Isolation by Region and City Size
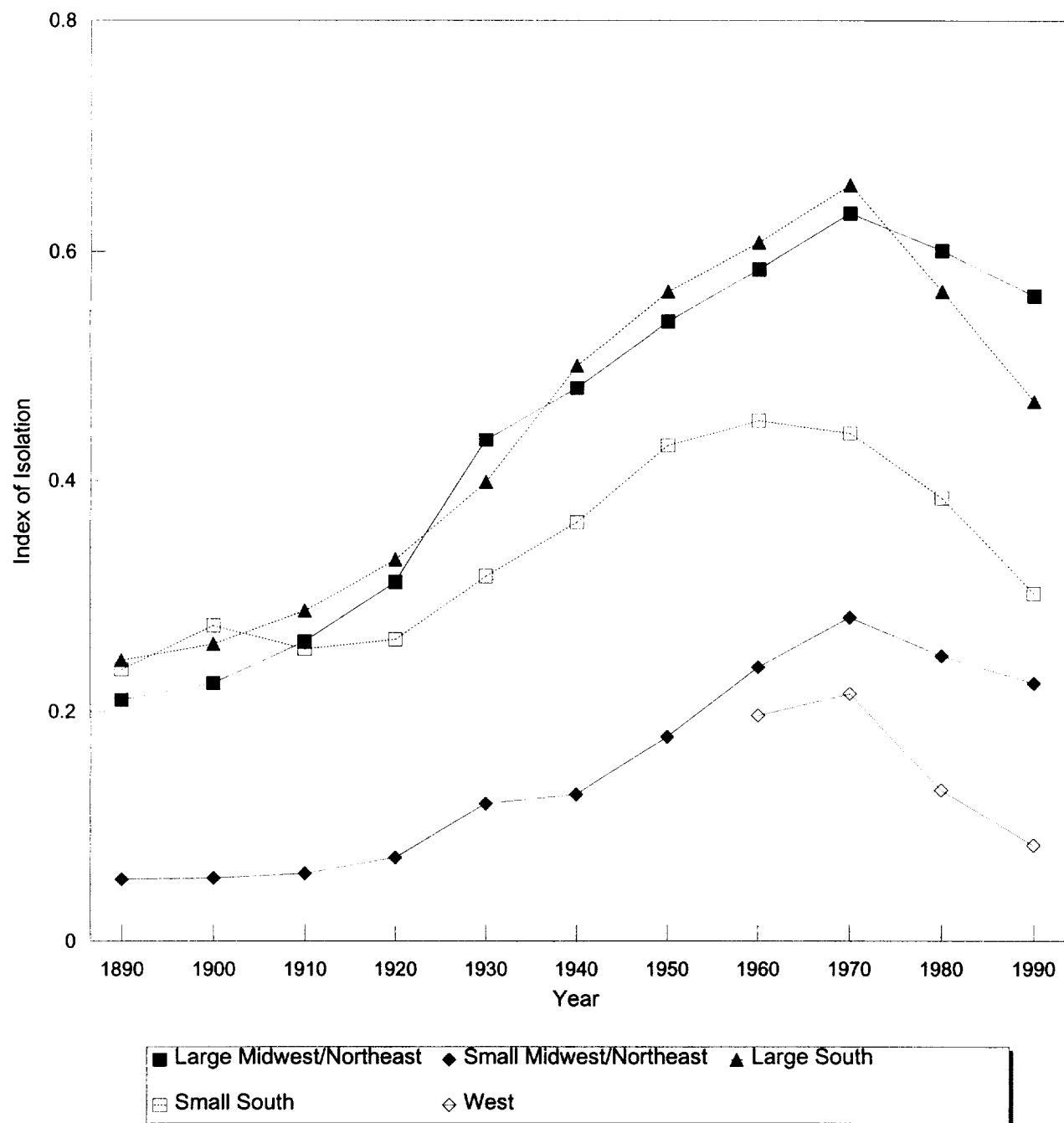
Figure 5: Segregation of the Foreign Born
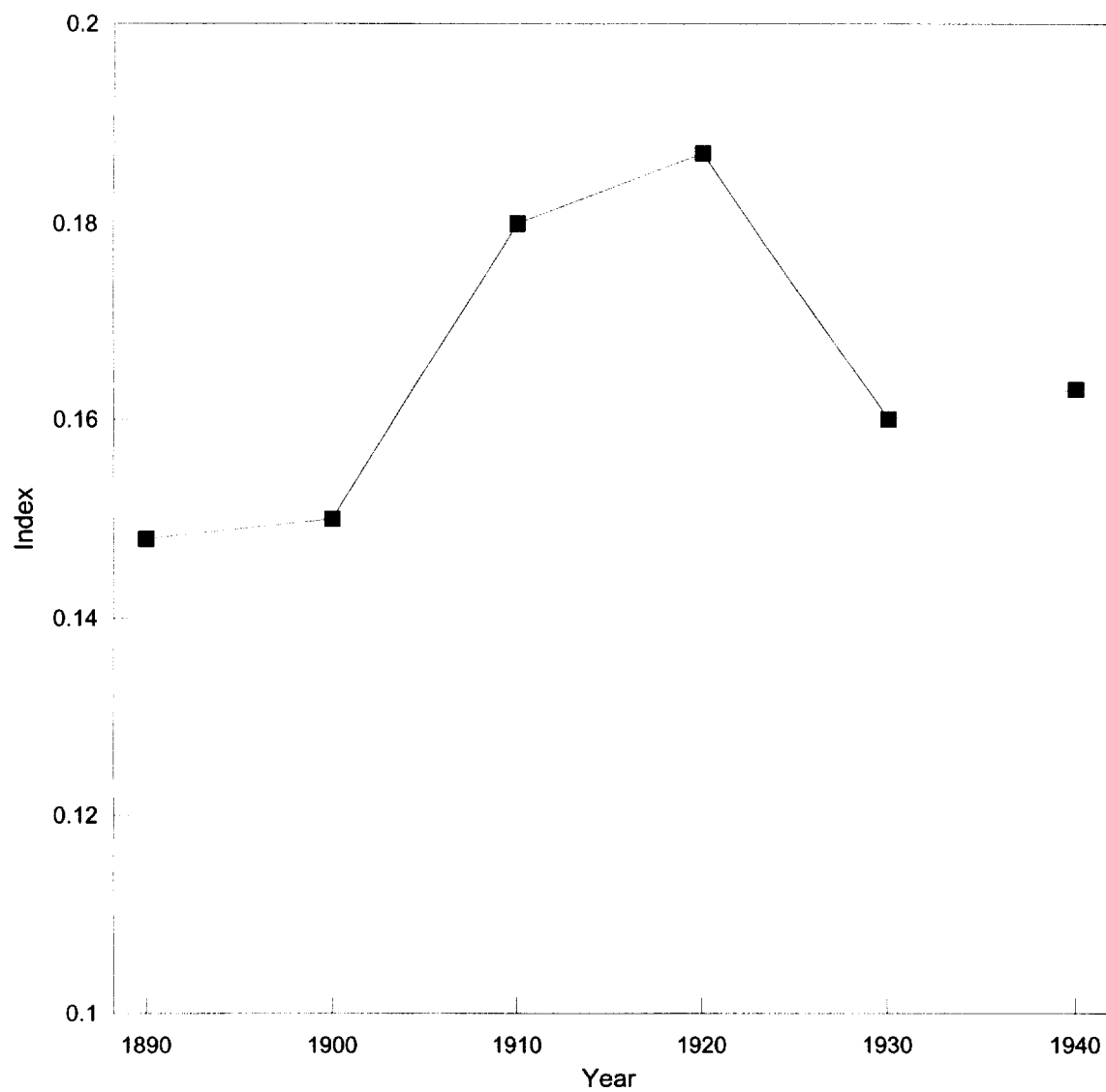
Figure 6: Cuyahoga County (Cleveland)

Euclid

East Cleveland

South Euclid

Cleveland Heights

University Heights

Shaker Heights

Beachwood

Newburgh Heights

Highland Hills

North Randall

Warrensville Height

Cuyahoga Heights

Garfield Heights

Bedford Heights

Brooklyn Heights

Maple Heights

4   0   4   8 Miles

City of Cleveland
Suburbs
Reached 75% Black by 1990
Reached 75% Black by 1970
Reached 75% Black by 1940
Cleveland Tracts

Figure 7: Atlanta SMSA

Legend:
- City of Atlanta
- Suburbs

- Under 5% Black, 1990
- 5 - 75% Black, 1990: Under 5% Black, 1970
- 5 - 75% Black, 1970 and 1990
- Over 75% Black, 1990

5   0   5   10 Miles

Figure 8: Sacramento County

City of Sacramento
Suburbs

Black Share Peaked in 1950
Black Share Peaked in 1970
Black Share Peaked in 1990
Black Share Always Under 5%

5   0   5   10 Miles
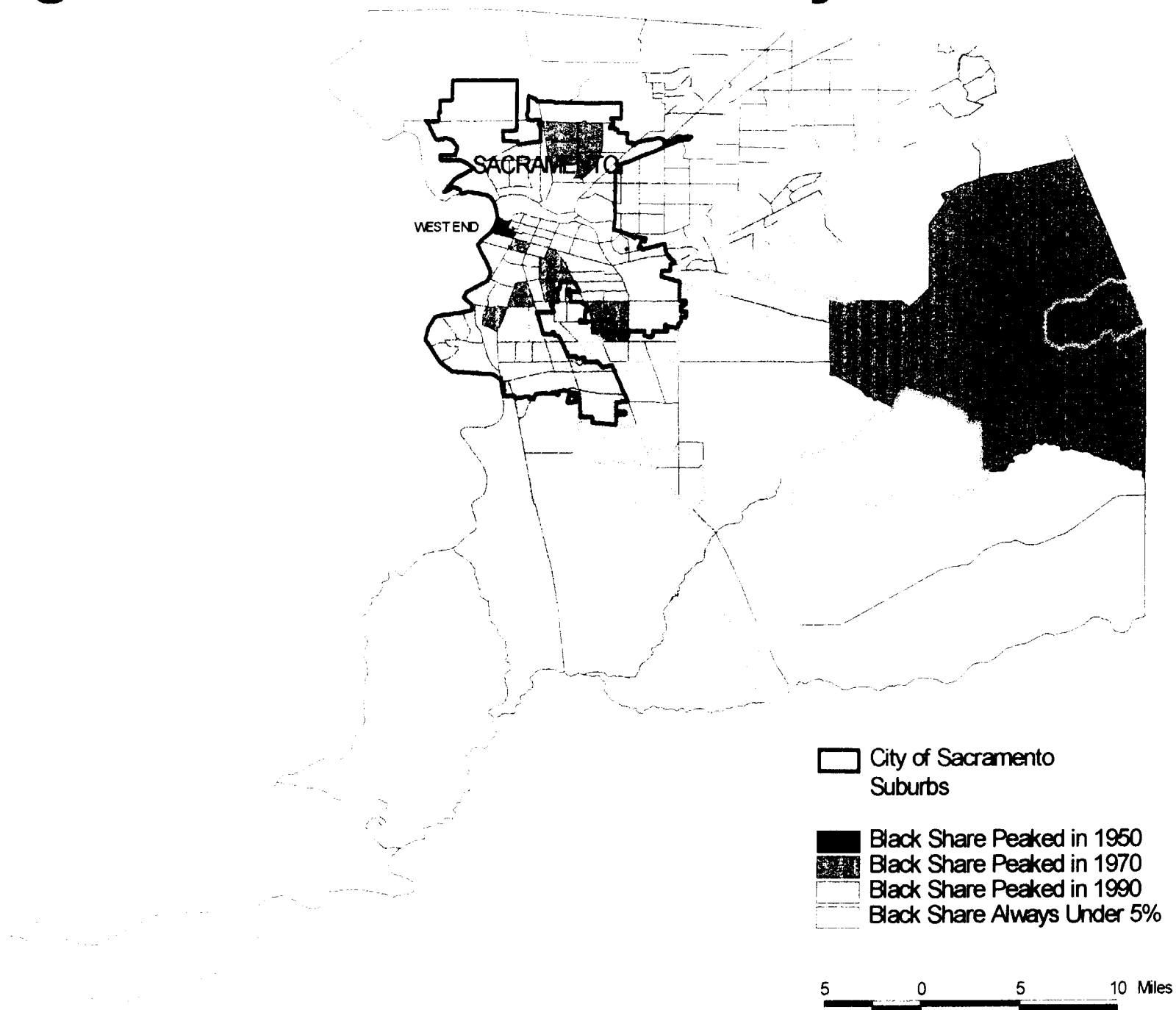
Table 1: Summary Statistics for Measures of Segregation

	Index of Dissimilarity				Index of Isolation			
	1890	1940	1970	1990	1890	1940	1970	1990
Number of Cities	60	109	211	313	60	109	211	313
Average Segregation								
Unweighted	.485	.679	.726	.599	.214	.371	.412	.255
Weighted by Black Population	.455	.717	.790	.659	.227	.463	.612	.467
Matched Cities	.390	.610	.697	.559	.042	.219	.363	.255
By Region (Matched Index):								
Northeast	.394	.601	.678	.592	.000*	.098	.253	.215
Midwest	.431	.645	.745	.621	.012	.219	.390	.309
South	.387	.611	.689	.552	.213	.385	.466	.320
West	---	---	.683	.444	---	---	.230	.084

Correlations Over Time:	Dissimilarity				Isolation			
1890	1.000				1.000			
1940	.607	1.000			.309	1.000		
1970	.362	.460	1.000		.229	.519	1.000	
1990	.470	.447	.676	1.000	.142	.501	.875	1.000
Correlation between Dissimilarity and Isolation	.385	.657	.633	.791	---	---	---	---

Note: Statistics include all cities, except as noted. Indices for 1890 and 1940 are ward-based indices adjusted for comparability to tract-based indices. See appendix for details. Matched cities are those included in the sample as of the year in the previous column. Matched indices are normalized to overall means in 1990 and linked to previous decades by mean differences.
* Estimate slightly below 0 because of changes in sample of cities over time.

Table 2: Demographic Change and Segregation

	Year				
	1890	1910	1940	1970	1990
Number of Ghettos, All Cities	1	5	55	127	98
Black Population, Matched Cities[*]					
Number (thousands)	874	1,499	3,772	13,945	18,732
Annual Growth Rate	---	2.7 %	3.1 %	4.4 %	1.5 %
Northeast/Midwest	---	3.7 %	4.4 %	4.7 %	0.9 %
South/West	---	2.3 %	2.2 %	4.0 %	2.0 %
Percent Black	7.5 %	7.1 %	10.8 %	13.9 %	16.2 %
Percent Black in Ward/Tract of Average Black[**]	20.0 %	22.6 %	37.6 %	69.7 %	60.9 %
Percent Foreign-Born (Hispanic)[†]	27.7 %	26.2 %	15.3 %	5.3 %	10.3 %
Alternative Measures of Dissimilarity, All Cities					
Black/Foreign-Born (Hispanic)[†]	.515	.559	.663	.693	.494
Black/Native White	.467	.546	.683	.735	.588
Foreign-Born (Hispanic)/Non-Foreign-Born [†]	.202	.234	.217	.530	.384
<High-School Educated Black/Non-Black	---	---	---	.757	.688
=High-School Educated Black/Non-Black	---	---	---	.746	.634
>High-School Educated Black/Non-Black	---	---	---	.743	.544

Note: Ward-based indices up to 1940 have been adjusted for comparability to tract-based indices.
[*] Constant set of 102 cities/SMSAs with population data reported in every year.
[**] Based on 50 cities in 1890, 55 cities in 1910, 71 cities with ward data in 1940, and 102 cities in 1970 and 1990.
[†] Foreign born through 1940; Hispanic after 1940.

Table 3: Distribution of Percent Black in Census Tracts

	1940	1960		1990	
	City	City	Suburbs	City	Suburbs
Number of Tracts	6,113	13,310	9,378	16,664	27,183
Percent of Tracts With Black Share:					
Exactly Zero	21.2	19.6	22.3	7.3	14.7
0 - 1 %	39.1	36.2	48.0	10.2	25.0
1 - 5 %	15.6	12.4	13.3	23.7	30.0
5 - 15 %	8.3	8.8	8.2	18.8	15.3
15 - 25 %	3.6	4.2	2.9	7.4	5.3
25 - 50 %	4.2	5.4	2.9	9.4	4.9
50 - 75 %	3.2	4.6	1.3	7.0	2.4
75 - 90 %	1.9	3.4	0.6	5.0	1.1
90 - 98 %	1.8	3.1	0.3	6.5	0.9
98 - 100 %	1.0	2.3	0.2	4.8	0.4

Note: The sample is census tracts with at least some population

Table 4: Segregation and Population Characteristics

Independent Variable	Index of Dissmilarity				Index of Isolation			
	1910	1940	1970	1990	1910	1940	1970	1990
ln(Population)	0.014	0.043**	0.069**	0.063**	0.001	0.048**	0.122**	0.079**
	(0.016)	(0.019)	(0.009)	(0.008)	(0.010)	(0.020)	(0.013)	(0.008)
ln(Density)	0.046*	0.042	-0.009	-0.005	0.018	0.007	-0.024*	0.005
	(0.025)	(0.033)	(0.010)	(0.009)	(0.016)	(0.034)	(0.014)	(0.010)
Foreign Born/Hispanic[†]	0.310	-0.111	0.027	-0.155**	0.036	-0.033	-0.013	-0.126*
Share	(0.193)	(0.362)	(0.031)	(0.058)	(0.121)	(0.376)	(0.047)	(0.065)
Black Share	-0.029	-0.412	-0.192*	0.074	0.171	0.193	1.018**	0.924**
	(0.175)	(0.253)	(0.111)	(0.076)	(0.110)	(0.263)	(0.167)	(0.086)
South Region	-0.058	-0.049	0.029	-0.040**	0.008	0.025	0.093**	0.021
	(0.060)	(0.077)	(0.025)	(0.020)	(0.037)	(0.079)	(0.038)	(0.022)
Midwest Region	-0.008	-0.017	0.067**	0.033*	-0.001	0.067	0.119**	0.088**
	(0.039)	(0.046)	(0.020)	(0.017)	(0.024)	(0.048)	(0.031)	(0.020)
West Region	-0.073	-0.222	-0.040	-0.147**	-0.029	-0.131	-0.079*	-0.108**
	(0.054)	(0.144)	(0.027)	(0.022)	(0.034)	(0.150)	(0.040)	(0.025)
N	72	81	186	312	72	81	186	312
R²	0.384	0.276	0.351	0.436	0.175	0.154	0.631	0.656

Note: Ward-based indices used in 1910 and 1940; tract-based indices in 1970 and 1990. Standard errors in parentheses.
* Statistically significant at the 10 percent level
** Statistically significant at the 5 percent level.
† Foreign Born in 1910 and 1940, Hispanic in 1970 and 1990.

Table 5: Segregation and the Costs of Mobility

Independent Variable	1910		1910		1970	
	Dissimilarity	Isolation	Dissimilarity	Isolation	Dissimilarity	Isolation
ln(Population)	0.046	0.025	-0.003	-0.002	0.066**	0.117**
	(0.036)	(0.019)	(0.022)	(0.012)	(0.009)	(0.013)
ln(Density)	0.067*	0.024	0.039	0.014	-0.007	-0.020
	(0.038)	(0.020)	(0.032)	(0.017)	(0.010)	(0.015)
Foreign Born/	0.208	-0.138	0.355	-0.103	0.019	-0.026
Hispanic[†] Share	(0.331)	(0.175)	(0.265)	(0.144)	(0.032)	(0.047)
Black Share	-0.104	0.028	-0.254	-0.152	-0.151	1.084**
	(0.397)	(0.209)	(0.373)	(0.202)	(0.117)	(0.175)
South Region	-0.094	-0.022	0.012	0.053	0.042	0.115**
	(0.091)	(0.048)	(0.101)	(0.055)	(0.026)	(0.040)
Midwest Region	-0.014	-0.024	0.087	0.020	0.066**	0.117**
	(0.050)	(0.026)	(0.052)	(0.028)	(0.020)	(0.031)
West Region	-0.018	-0.021	-0.050	-0.038	-0.015	-0.034
	(0.085)	(0.045)	(0.058)	(0.032)	(0.031)	(0.046)
Trolley Passengers Per	-0.001	-0.0003	---	---	---	---
Capita, 1902	(0.001)	(0.0003)				
Black Servant Share,	---	---	0.777*	0.395*	---	---
1910			(0.395)	(0.214)		
Growth in Urban	---	---	---	---	-0.053	-0.089
Mileage, 1950-1960					(0.042)	(0.062)
N	35	35	40	40	185	185
R²	0.599	0.265	0.589	0.321	0.357	0.634

Notes: Ward-based indices used in 1910; tract-based indices in 1970 and 1990. Standard errors in parentheses.
* Statistically significant at the 10 percent level. ** Statistically significant at the 5 percent level.
[†] Foreign Born in 1910, Hispanic in 1970.

Table 6: Restrictive Deed Covenants

City	Dissimilarity Index, 1940	Number of Deeds		Comments
		In Sample	With Race Restrictions	
Most segregated cities: 25 deeds, 68% have restrictive covenants				
Chicago	.944	15	10 (67%)	Technically, restrictions are "conditions," not covenants.
Cleveland	.871	2	0 (0%)	
Los Angeles	.838	4	4 (100%)	"Caucasian only" restrictions directed primarily at Asians.
Detroit	.834	4	3 (75%)	
Less segregated cities: 26 deeds, 50% have restrictive covenants				
Boston	.814	3	0 (0%)	
Baltimore	.789	3	3 (100%)	"Seller approval" restrictions in two cases.
New York	.766	2	0 (0%)	
Minneapolis	.760	2	2 (100%)	
Lansing MI	.739*	1	1 (100%)	Alienation restricted, but not occupancy.
Kansas City MO	.734	2	2 (100%)	
Springfield MA	.719*	1	0 (0%)	
Seattle	.709	4	2 (50%)	"Caucasian only" restrictions directed primarily at Asians.
San Francisco	.693	1	1 (100%)	"Caucasian only" restrictions directed primarily at Asians.
Louisville	.689	2	0 (0%)	
Birmingham	.686	1	1 (100%)	Occupancy restricted, but not alienation.
Providence	.653	2	0 (0%)	
South Bend	.582*	1	1 (100%)	"Caucasians only, except business"
Little Rock	.536*	1	0 (0%)	

Note: Dissimilarity is based on tract data. Ward-based indices, corrected for mean differences between ward and tract indices, are used where noted by *. T-statistic of mean difference is 2.57. Source: Monchow (1928) pp. 47-50.

Table 7: Changes in Racial Composition of Census Tracts

	Cleveland				Atlanta			Sacramento		
	1910	1940	1970	1990	1940	1970	1990	1950	1970	1990
Characteristics of city										
Number of Blacks (thousands)	8	85	331	355	105	309	735	5	37	101
[Percent]	[2%]	[10%]	[16%]	[20%]	[35%]	[22%]	[26%]	[3%]	[5%]	[7%]
Dissimilarity Index	.659	.843	.873	.824	.719	.776	.648	.557	.623	.478
Isolation Index	.076	.630	.720	.708	.575	.635	.489	.106	.202	.136
Number of Matched Census Tracts	82	106	252	254	53	123	209	27	105	120

Characteristics of Census Tracts with Racial Change

	Central City			Suburbs	Central City		Suburbs	Central City		Suburbs
Years	1910-30	1940-60	1970	1960-70	1940-60	1970	1960-70	1950-60	1970	1960-70
Tracts Reaching 25% Black	15	28	12	10	31	13	8	3	2	1
Number Greater Than 75% Black 20 Years After Reaching 25% Black	10	27	8	5	24	11	4	0	0	0

Note: The sample is Census tracts that have been matched over time to be constant areal units.

Table 8: Comparisons of Tract and Block Group Dissimilarity, 1990

	Cleveland	Atlanta	Sacramento
Central City			
Tract	0.872	0.791	0.428
Block Group	0.880	0.805	0.467
Suburbs			
Tract	0.805	0.566	0.463
Block Group	0.826	0.623	0.563

Note: Indices use unmatched tract data.

Table 9: Segregation and Housing Rents

Independent Variable	Dependent Variable: ln(Annual Rental Payment) in year:					
	1940	1940	1970	1970	1990	1990
Black Head of HH	-1.437**	-1.415**	-0.556**	-0.626**	-0.235**	-0.233**
	(0.451)	(0.662)	(0.233)	(0.233)	(0.078)	(0.079)
Dissimilarity Index	0.152	0.359	0.318*	0.317*	-0.109	-0.020
	(0.257)	(0.261)	(0.175)	(0.169)	(0.158)	(0.164)
Dissimilarity*Black Head of HH	1.470**	1.199	0.463	0.584**	0.131	0.129
	(0.575)	(0.911)	(0.288)	(0.284)	(0.116)	(0.117)
Born in Different State	---	0.348*	---	---	---	---
		(0.190)				
Born in Diff. State* Dissimilarity	---	-0.391	---	---	---	---
		(0.234)				
Born in Diff. State* Black	---	0.323	---	---	---	---
		(0.652)				
Born in Diff. State* Black* Dissimilarity	---	-0.078	---	---	---	---
		(0.883)				
R^2	0.239	0.247	0.182	0.310	0.197	0.233
Black Head of HH	-1.121**	-1.104**	-0.373**	-0.448**	-0.048	-0.033
	(0.204)	(0.354)	(0.174)	(0.150)	(0.041)	(0.039)
Dissimilarity*Black Head of HH	1.155**	1.028**	0.226	0.369*	-0.162**	-0.165**
	(0.248)	(0.504)	(0.224)	(0.190)	(0.061)	(0.058)
Born in Different State	---	0.037	---	---	---	---
		(0.090)				
Born in Diff. State* Dissimilarity	---	-0.048	---	---	---	---
		(0.103)				
Born in Diff. State* Black	---	0.112	---	---	---	---
		(0.409)				
Born in Diff. State* Black* Dissimilarity	---	-0.002	---	---	---	---
		(0.558)				
R^2	0.330	0.330	0.249	0.385	0.358	0.413
Structural Characteristics	No	No	No	Yes	No	Yes
N	53,368	53,368	120,159	120,159	162,809	162,809
Number of Cities	43	43	116	116	281	281

Notes: Models below the dotted line include city/MSA fixed effects. Standard errors, corrected for grouped observations, in parentheses. Regressions include age, age squared, sex, whether the householder is married, number of persons in household, log household earned income, a dummy variable indicating that a household member has topcoded income, and a dummy indicating topcoded rent in 1990. Structural controls include categorical variables for age of the structure, and categorical variables for structure type (mobile home, detached single family home, attached single family home, 2-family building, 3-4 family building, 5-9 family building, 10-19 family building, 20-49 family building, 50+ family building or "other") Contract rent is used in 1940, gross rent thereafter.
* Statistically significant at the 10 percent level.
** Statistically significant at the 5 percent level.

Table 10: Segregation and Attitudes Towards Integration

Independent Variable	Black Attitudes Prefers Majority-White Neighborhood (1982)	White Attitudes Believes in right to segregated housing (1972-1993)		Supports ban of interracial marriage (1972-1993)	Would not live in 50% Black Neighborhood (1990)
Dissimilarity Index, 1980/1990[†]	0.250 (0.462)	0.196** (0.062)	0.168** (0.080)	-0.104** (0.052)	0.356 (0.221)
South Region	-0.251** (0.060)	0.077** (0.015)	0.090** (0.027)	0.152** (0.013)	0.047 (0.053)
Midwest Region	-0.024 (0.072)	0.022 (0.015)	0.028 (0.024)	0.061** (0.012)	-0.067 (0.051)
West Region	0.022 (0.091)	-0.023 (0.015)	-0.005 (0.027)	-0.016 (0.012)	-0.042 (0.057)
ΔDissimilarity, 1970-1990	---	---	0.263 (0.238)	---	---
Time Trend	---	---	-0.012** (0.002)	---	---
ΔDissimilarity* Time Trend	---	---	-0.009 (0.012)	---	---
Year Effects	---	Yes	No	Yes	---
Education, Sex, and Age Controls	Yes	Yes	Yes	Yes	Yes
N	362	8,795	8,478	11,111	677
R^2	0.112	0.113	0.110	0.204	0.042

Notes: Standard errors, corrected for grouped observations, in parentheses.
* Statistically significant at the 10 percent level.
** Statistically significant at the 5 percent level.
† Dissimilarity in 1980 used in the first four columns, 1990 values used in the last column.

Theory Appendix

In this appendix, we show how decentralized white racism can produce a segregated equilibrium, and we characterize that equilibrium.

Consider an area of town i, with black share P_i. We express the white and black willingness to pay to live in area i as:

$$\textit{White WTP} = [V_W + B_W \cdot (1 - P_i)] - \delta_W(P_i)$$

$$\textit{Black WTP} = [V_B + B_B \cdot P_i] - \delta_B(1 - P_i) - \psi(1 - P_i)$$

(A1)

The first term in each equation (the term in [.]s) is the race-specific values of the area; V and B are positive constants so that this value decline as more people of that race live in the area, reflecting heterogeneity in living preferences. The second term is the discrimination term; whites dislike living in an area with more blacks, while blacks like being in an area with more blacks. We think of $\delta_W(.)$ as reflecting decentralized white racism; it is racist sentiments that are manifest only in the willingness to pay to live in an area. $\delta_B(.)$ is the desire of blacks to live in a black neighborhood; this corresponds to the port of entry effect in the text. $\psi(.)$ is the additional cost blacks must pay to live in a white neighborhood; $\psi(.)$ is a proxy for the (legal or illegal) costs imposed on blacks by whites to live in a white neighborhood.

The equilibrium percent black is given by:

$$V_W + B_W \cdot (1 - P_i) - \delta_W(P_i) = V_B + B_B \cdot P_i - \delta_B(1 - P_i) - \psi(1 - P_i)$$

(A2)

We assume there are two stable equilibria.[29] The first stable equilibrium has a high level of blacks (which we denote P_H). In this equilibrium, we will assume that $\delta_B(.) \approx 0$ and $\psi(.) \approx 0$, and that $\delta_W(.) \approx \delta^*_W$, the maximum possible value. The equilibrium share of blacks under this condition is: $P_H = (V_B + B_W + \delta^*_W - V_W) / (B_W + B_B)$. In an area with a low level of blacks (denoted P_L), we assume that $\delta_W(.) \approx 0$, and that $\delta_B(.)$ and $\psi(.)$ are equal to δ^*_B and ψ^*. The share of blacks in the area will be: $P_L = (V_B + B_W - \delta^*_B - \psi^* - V_W) / (B_W + B_B)$.

To normalize our variables, we assume that $V_B = V_W$, and that if there were no discrimination the share of blacks in the area is the citywide share. This requires that $P = B_W / (B_B + B_W)$. Finally, we define $\gamma_B = (\delta^*_B + \psi^*) / (B_B + B_W)$, and $\gamma_W = \delta^*_W / (B_B + B_W)$, so that $P_H = P(1 + \gamma_W)$ and P_L

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[29] For this to be true, it must be the case that there exists exactly one point P' satisfying (A2) and for which $\delta'_W(P') + \delta'_B(1 - P') + \psi'(1 - P') > (B_B + B_W)$, where a ' on the function δ or ψ denotes a derivative.

$=P (1-\gamma_B)$.

Straightforward algebra shows that:

$$Index \ of \ Dissimilarity \ = \ \frac{1}{1-P} \cdot \frac{\gamma_W \gamma_B}{\gamma_W + \gamma_B} \tag{A3}$$

This index is rising in either one of the three discrimination parameters. Thus, increasing discrimination along any dimension will show up as an increase in segregation.

While the indices do not help us sort out what is driving discrimination, the model predicts that the difference in housing costs between the white and black communities is just the difference in willingness to pay in the white community less willingness to pay in the black community, or:

$$(WTP_W - WTP_B) \ = \ (1-P)\delta_W^* - P(\delta_B^* + \psi^*) \tag{A4}$$

If discrimination is fueled by white tastes, then whites will pay more for housing than blacks. If discrimination is the product of either black tastes or formal constraints on black mobility, however, blacks will pay more for housing.

Data Appendix

This appendix describes the data and empirical methods used in this paper. It begins by detailing the creation of our 100 year panel of segregation indices, explaining many of the quality and comparability issues that arise in such a task. The following section provides technical definitions of three alternative measures of segregation, as well as summary statistics for these indices using 1990 tract data. The final three sections discuss the sources and methodology involved in the mobility cost, housing rent, and attitudinal regressions, respectively.

Measuring Segregation, 1890-1990

The source of our segregation data is the decennial Census of Population. The census reports some form of sub-city data for cities above 25,000 in 1890 and above 50,000 in every subsequent year. To ensure at least a minimum number of blacks, our samples include only those cities with at least 1,000 blacks in a given year. The data were gathered by hand for 1890 to 1950, and from computer tape after 1950.

Table A1 shows characteristics of the sample. From 1890 to 1940, population characteristics are reported by wards. There are several reasons to be cautious about statistics derived from these data. Wards are political units which vary widely in population size and area across cities. In 1910, Philadelphia's 47 wards on average spanned 1773 acres and contained about 33,000 individuals, while Harrisburg's 13 wards averaged 262 acres and about 5,000 inhabitants. Moreover, wards do not always represent geographically compact areas. Detroit's wards comprise thin strips of land perpendicular to the Detroit river. Each ward is only a few blocks wide but extends from the river to the inland city limits.

The role of wards as political boundaries may be another cause for concern. City officials wishing to minimize the impact of black voters might draw wards so as to divide the black population evenly among them, creating apparent patterns of racial integration in the data. The black population of Beaumont, Texas is almost perfectly divided amongst the city's three wards in 1930 and 1940 (leading to dissimilarity indices on the order of 0.02), but subsequent tract data reveals a high degree of neighborhood segregation.

From 1940 onward we are able to use census tracts.[27] Tracts are designed to be geographically compact and socioeconomically homogeneous areas, usually delimited by major streets, city boundaries, or natural features, containing approximately 4,000 individuals. This average population size has remained constant through time; tracts are sometimes subdivided or combined to reflect population growth or decline in a given area. Tracts more closely approximate the concept of a "neighborhood" than wards, and are more readily comparable across cities and over time.

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[27] Some cities, primarily in the South and West, do not report ward statistics in 1930 or 1940, presumably because these areas were no longer used for city government.

The existence of both ward and tract data for 47 cities in 1940 allows us to compare measured segregation using both areal units. Since tracts are almost always finer divisions than wards, measured segregation is higher using the tract definition. Based on census tracts, the average dissimilarity index in these 47 cities was 0.724, compared with 0.577 based on ward data. The tract-based isolation index averages 0.385, compared to 0.284 at the ward level. The measures are highly correlated across cities: 0.680 for the dissimilarity index and 0.706 for the isolation index. These values suggest that in spite of cross-city heterogeneity and other data quality issues, ward-based measures provide a reasonably accurate view of segregation levels.

To enhance the comparability of tract and ward based indices, we employ a correction factor based on the mean difference between ward and tract segregation in the 47 cities with both measures in 1940. The mean differences are 0.152 for the Index of Dissimilarity, and 0.157 for the Index of Isolation. Table A2 lists the means for both indices across time with and without this correction factor.

In most cities and metropolitan areas, census tracts are relatively constant over time. Occasional shifts in boundaries may occur, and subdivisions of tracts into smaller units are quite common in growing areas. In our three case study cities, we have compiled comprehensive lists of these changes in tracts over time in order to match data at the tract level. As Table A3 illustrates, the number of matched tracts always falls short of the total number of tracts in a census year, since some tracts must be combined to assure that their boundaries are truly invariant. The only source of growth (or decay) in the number of matched tracts is annexation (or secession) of new territory to the city or metropolitan area. The values in Table A3 also reflect some fluctuation resulting from tracts falling to zero population in certain years.

Table A3 effectively demonstrates the extent of annexation in the case study cities. Annexation is quite common in other cities as well. Between 1900 and 1930, for example, Los Angeles grew from slightly under 43 square miles to 440 square miles. We use city and metropolitan area boundaries as they existed at the time when measuring segregation. There is some concern that changes in these boundaries might produce changes in measured segregation even if residential patterns have not been altered. In our case study city of Cleveland, we attempt to measure the magnitude of this effect by calculating tract-based indices for 1910 through 1960 using only the 82 tracts that were part of the city in 1910. The effects of annexation amount to slight decreases in both the dissimilarity and isolation indices, but these changes are not particularly large.[28]

The suburbanization of residence and economic activity through the 20th century is another concern. In the early part of the time period, our data is for cities. As early as 1930, the Census Bureau began reporting characteristics for areas surrounding major cities. By 1960, the concept of a Standardized Metropolitan Statistical Area (SMSA) had been formed, and

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[28] The greatest decrease in the dissimilarity index is 0.015, for the isolation index, 0.026. Cleveland grew in area from 45.6 square miles in 1910 to 73.1 square miles in 1940.

data for tracts outside of central cities became widely available in that decade and the next. We move from central city based measures to metropolitan area measures as the data changes. We can test for the importance of this for segregation by sampling in the later years for central city census tracts alone. In 1960, city and SMSA based dissimilarity measures correlate at 0.817, and the difference in means is almost imperceptible (0.741 versus 0.746). The city and SMSA isolation indices correlate even more strongly (0.976), with a slightly larger mean difference (0.436 vs. 0.415). Because we think that the SMSA is a more appropriate notion than the city, we use the SMSA measure in our empirical work.

From 1960 to 1990, the number of SMSAs in our sample grows from 145 to 313. Many of the new SMSAs represent areas previously not considered metropolitan. Others are areas previously contained in a larger SMSA that have been separated into their own metropolitan area. Examples of these include Newark, separated from the New York SMSA in 1970, and Oakland, separated from the San Francisco SMSA in 1990. We treat these areas as new SMSAs when their data appears.

In 1970, the census suppresses population counts for areas with under 25 persons. The count of blacks is likewise suppressed for tracts with fewer than 25 blacks. To estimate the effect of this on measured segregation, we imposed identical restrictions on the 1990 tract data. The average segregation level in the 313 SMSAs increases slightly (0.559 to 0.576 for the dissimilarity index, 0.255 to 0.257 for the isolation index) when the restrictions are imposed. The correlation between indices with and without the restrictions is 0.962 for the dissimilarity index and 0.9998 for the isolation index. The 1970 measures are therefore probably mild overestimates of true segregation.

For our three case study cities, we also formed segregation using block groups rather tan tracts. Block groups cover about one-fourth the area of census tracts. These data are reported in Table 8.

Alternative Measures of Segregation

Massey and Denton (1988b) propose several alternative measures of segregation. Of the five measures that they choose to represent "dimensions" of segregation, two correspond to our dissimilarity and isolation indices. The other three appear in table A4 and are defined as follows.

The clustering index, or White's (1983) index of Spatial Proximity, is the weighted average of relative black proximity to other blacks and relative non-black proximity to other non-blacks. Average absolute intragroup proximity, P_{xx}, is defined as

$$P_{xx} = \frac{1}{X^2} \sum_{i=1}^{n} \sum_{j=1}^{n} x_i x_j e^{-d_{ij}}$$

where an SMSA's n census tracts are indexed by i and j, x_i is the number of blacks in tract

i, X is the number of blacks in the SMSA, and d_{ij} is the distance from tract i to tract j. The distance from a tract to itself is defined to be six-tenths the square root of its area. Redefining X to be non-blacks or persons, we obtain average proximity for other groups.

Relative proximity is simply the ratio of intragroup proximity, P_{xx}, to overall proximity, P_{tt}. The clustering index weighs these values for blacks and non-blacks by their share in the population. This average takes on a value of one if intragroup proximity equals overall proximity for both groups. The clustering index is obtained by subtracting one from this value. Negative values are possible in the event that black proximity to non-blacks exceeds proximity to other blacks.

$$Index\ of\ Clustering\ =\ \frac{X{\cdot}P_{xx}\ +\ Y{\cdot}P_{yy}}{T{\cdot}P_{tt}}\ -\ 1$$

As Table A4 reports, the average Index of Clustering among our 313 SMSAs in 1990 was 0.196. Benton Harbor, MI claims the highest index value. Detroit, owner of the highest Dissimilarity and Isolation indices, comes in a close second. Bristol CT has the smallest, and only negative, value.

The concentration index takes on a value of one if blacks inhabit the geographically smallest tracts in an SMSA, and -1 if whites do. Equal distribution of the races across tracts of varying size results in an index value of zero. The following formula produces the concentration index:

$$Index\ of\ Concentration\ =\ \left(\frac{\sum_{i=1}^{n}\frac{x_i a_i}{X}}{\sum_{i=1}^{n}\frac{y_i a_i}{Y}}-1\right)\ \Bigg/\ \left(\frac{\sum_{i=1}^{n_1}\frac{t_i a_i}{T_1}}{\sum_{i=n_2}^{n}\frac{t_i a_i}{T_2}}-1\right)$$

Here, x represents the less concentrated group and y the more concentrated group. Tracts are indexed by i and ordered from largest to smallest; the set ($i = 1 \ldots n_1$) is the set of largest tracts containing population equivalent to X and the set ($i = n_2 \ldots n$) is the set of smallest tracts containing population equivalent to Y. Thus the numerator measures the ratio of tract area of the "average" x member to tract area of the "average" y member, and the denominator is the theoretical maximum for this measure. In most cases, non-blacks are identified as group x and blacks as group y. Where this is not the case, the index is assigned a negative value. Concentration averaged 0.595 in 1990. The maximum value belongs to Cheyene, WY, the minimum to Charleston, SC.

The final segregation index measures the centralization of the black population, or the degree to which their distribution around the central business district is tighter than the distribution of land around the city center. Arranging an SMSA's n tracts in order of proximity to the

central business district (defined to be a point in space), we use the following formula:

$$Index\ of\ Centralization\ =\ \sum_{i=1}^{n} X_{i-1}A_i\ -\ \sum_{i=1}^{n} X_iA_{i-1}$$

Here X_i is the cumulative proportion of blacks living in the first i tracts, and A_i is the cumulative proportion of area. Negative values represent a decentralized black population, a value of zero indicates an even distribution of blacks in terms of distance to the CBD. In 1990, the mean value of this index was 0.150. Sioux City, IA had the most centralized black population in 1990, Racine, WI the least.

Mobility Cost Regressions

The regressions reported in Table 5 use three different measures of mobility costs. The first measure is derived from the 1902 Census of Streetcar Railways, published by the Bureau of the Census in 1904. This source provides ridership, track mileage, and revenue statistics for trolley systems in a select group of major cities. The 1900 Census population of the area served by the streetcar system is also provided. To form our measure, we took the number of revenue passengers and divided by the population reported. The resulting measure has a mean of 186 and a standard deviation of 59.

The share of blacks employed as servants can be computed from the occupational reports of the 1910 Census. Occupational breakdowns by race are available only for cities with at least 100,000 residents, thus our sample size is only 40 cities. The share variable is the number of blacks (male and female) employed as servants divided by the number of employed blacks. The sample mean is 21 percent, with a standard deviation of 5 percent.

Finally, growth in total urban mileage is measured as the change in the logarithm of miles of state-maintained highways in urban areas. This variable is measured at the state level and covers the period from 1950 to 1960. The mean is 0.32 and the standard deviation is 0.24.

Housing Rent Regressions

Microdata on housing rents comes from the Integrated Public Use Microdata Samples (IPUMS) of 1940, 1970 (15 percent County Group Sample), and 1990 (1 percent Sample). In all three years, we matched individuals to segregation indices based on their metropolitan area of residence. In 1940, tract-based segregation indices exist only at the city level; individuals were assigned the index of the largest city in their metropolitan area.

The sample in each year consists of renter households paying at least some rent, but less than a topcoded amount in each year. The 1940 sample includes individuals paying $200 per month or less, the 1970 sample $998 or less, and in 1990, $1,500 or less. In each case, removing topcoded households from the sample reduces the sample size by one percent or less. Rent values in 1940 represent "contract rent," or the actual amount due to the landlord

each month. In 1970 and 1990, we use gross rent, which includes payments for utilities if the tenant is responsible for them.

The regressions reported include controls for age, sex, marital, and racial characteristics of the householder, as well as controls for household size and income. In 1970 and 1990, additional information about the housing unit is available. We include categorical variables for the age and type of the structure. Included types are mobile home, detached single family home, attached single family home, 2-family building, 3-4 family building, 5-9 family building, 10-19 family building, 20-49 family building, 50+ family building, or "other."

Measuring Attitudes: the General Social Survey

To measure attitudinal influences and segregation as well as the effect of segregation on social outcomes, we turned to the General Social Survey. We coded responses into dummy variables as follows. Whites were classified as "unwilling to live in a 50% black neighborhood" if they responded "oppose" or "strongly oppose" to "living in a neighborhood where half of your neighbors were blacks." (LIVEBLK, Q. 389B) Support of a ban of interracial marriage is revealed directly (RACMAR, Q. 125A). We coded whites as believing in a right to segregated housing if they strongly or slightly agreed with the statement "White people have a right to keep blacks out of their neighborhoods if they want to, and blacks should respect that right." (RACSEG, Q. 127B)

Blacks were coded as preferring a majority-white neighborhood if they indicated "half black half white" or "mostly white" rather than "all black" or "mostly black" as their first choice in residential neighborhood composition (RACNEIGH, Q. 142). Respondents who indicated that whites attended the church that they frequented most often (RACCHURH, Q. 137) were coded as attending an integrated church.

Table A1: Characteristics of Sub-City Data

Year	Number of Cities		Basis of Sub-City Data	Notes About Data
	All City	Matched		
1890	60	---	Ward	Population threshold of 25,000 for ward data. Data for Brooklyn, Long Island City, College Point, Coney Island, Flushing, Jamaica, Port Richmond, and Whitestone were added to New York City (these areas were in the city by 1900).
1900	54	46	Ward	Population threshold of 50,000 for ward data (consistent for remaining years)
1910	72	54	Ward	---
1920	90	65	Ward	---
1930	111	85	Ward	Mexicans and other Latin Americans not classified as white
1940	109/58	104	Ward/ Tract	Forty-seven cities have both ward and tract data.
1950	76	50	Tract	---
1960	158	59	Tract	Tracting switches from city to SMSA basis (constant for remaining years)
1970	211	156	Tract	Tract data suppressed for tracts with fewer than 25 in reference group
1980	284	206	Tract	---
1990	313	272	Tract	---

Table A2: Means Across Cities

Year	N	Index of Dissimilarity		Index of Isolation	
		Unadjusted	Adjusted	Unadjusted	Adjusted
1890	60	0.332	0.484	0.057	0.214
1900	54	0.385	0.537	0.068	0.225
1910	72	0.397	0.549	0.087	0.244
1920	90	0.441	0.593	0.121	0.278
1930	111	0.493	0.645	0.180	0.337
1940 Ward	109	0.527	0.679	0.214	0.371
1940 Tract	58	0.719	0.719	0.382	0.382
1950	76	0.734	0.734	0.437	0.437
1960	158	0.742	0.742	0.416	0.416
1970	211	0.726	0.726	0.412	0.412
1980	284	0.629	0.629	0.321	0.321
1990	313	0.559	0.559	0.255	0.255

Note: Adjustment factor is based on the mean difference between ward and tract-based segregation in 1940 for the 47 cities reporting both measures. Correlation between ward and tract index of segregation in 1940 is .715 (dissimilarity) and .700 (isolation).

Table A3: Tract Matching in Case Study Cities

Year	Cleveland Tracts		Atlanta Tracts		Sacramento Tracts	
	Unmatched	Matched	Unmatched	Matched	Unmatched	Matched
1910	109	82	---	---	---	---
1920	169	100	---	---	---	---
1930	201	102	---	---	---	---
1940	206	106	74	53	---	---
1950	206	106	74	53	33	27
1960	366	233	179	122	98	77
1970	457	252	234	123	172	105
1980	499	255	352	184	204	105
1990	611	254	477	209	303	120

Note: Counts include only those tracts with population greater than zero in a given year.

Table A4: Correlations and Summary Statistics of Black/Non-black segregation indices, 1990

Index	Dissimilarity	Isolation	Clustering	Concentration	Centralization
Dissimilarity	1.000				
Isolation	0.769	1.000			
Clustering	0.726	0.866	1.000		
Concentration	0.408	0.165	0.227	1.000	
Centralization	0.008	0.012	0.023	0.027	1.000
Mean	0.559	0.255	0.196	0.595	0.150
Std. Deviation	0.129	0.186	0.215	0.268	0.385
Minimum	0.206	0.005	-0.003	-0.018	-0.917
Maximum	0.873	0.763	0.993	0.960	0.942

Note: 313 observations. Dissimilarity and Isolation indices computed according to formulas in the text. The Clustering index (White, 1983) measures the extent to which blacks live closer to other blacks than to nonblacks. The Concentration index (Massey and Denton, 1988) measures the tendency of blacks to live in the smallest tracts in an SMSA. The Centralization index (Massey and Denton, 1988) indicates whether blacks live closer to the Central Business District of an SMSA than non-blacks.