**Decreasing Black-White Residential Segregation, 1990-2000: How Much Did**

**Improvements in Black SES and Black Population Redistribution Matter?**

Craig St. John*

Department of Sociology
University of Oklahoma
Norman, OK 73019
cstjohn@ou.edu


and


Tessa North

Oklahoma Center for the Advancement of
Science and Technology
755 Research Parkway, Suite 110
Oklahoma City, OK 73104

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* Direct all correspondence to Craig St. John

**Abstract**

Between 1990 and 2000 the black population made significant improvements in socioeconomic status and tended to move away from the largest and oldest metropolitan areas of the Northeast and the Midwest.  Both of these trends should have contributed to reduced black segregation from whites because blacks with higher socioeconomic status are less segregated from whites than are blacks with lower status and the large metropolitan areas of the Northeast and Midwest tend to have the highest levels of black-white segregation in the U. S.  We examine the contribution of these trends to reductions in black-white segregation between 1990 and 2000 by applying a decomposition analysis to a standardized interaction index (P*).  We find that 25% of the increased exposure of blacks to whites between 1990 and 2000 can be attributed to improvements in the level of black education and 17% can be attributed to the redistribution of blacks among metropolitan areas.  Our results are consistent with the structural assimilation model of ethnic/minority incorporation.  That is, as the black population becomes more similar to the white population in terms of socioeconomic status and regional geographic distribution, blacks increasingly share neighborhoods with whites.

# Introduction

By 1970 blacks in American cities were segregated from whites in nearly apartheid-like conditions (Massey and Denton 1993). However, in recent decades there have been modest but clear reductions in black-white residential segregation (Farley and Frey 1994; Iceland, Weinberg, and Steinmetz 2002; Logan, Stults, and Farley 2004). Logan, Stults, and Farley (2004) proposed four explanations for the decline in black-white segregation between 1990 and 2000. (1) One was that whites appear to have become more accepting of the principle of residential integration and less resistant to living with black neighbors. (2) Another was that during the 1990s blacks tended to move to newer metropolitan regions in the South and West which were less segregated than those in the Northeast and Midwest from which they came. While this migration might not reduce the level of black-white segregation in any individual metropolitan area, it might reduce the collective level of segregation blacks experienced aggregated over all metropolitan areas. (3) A third explanation is that the socioeconomic status of blacks improved during the 1990s relative to the socioeconomic status of whites such that blacks had greater access to neighborhoods inhabited by whites. (4) And, last, U. S. metropolitan areas became more multi-ethnic in the 1990s; the growth of Hispanic and Asian populations in many metropolitan areas might reduce white resistance to living with blacks. In this paper we provide an examination of the second and third explanations using a standard demographic technique that, to our knowledge, has not been applied to this issue, Kitagawa's (1955) method for decomposing the difference between two crude rates. That is, we will present an analysis that measures the contribution of improving black socioeconomic status between 1990 and 2000, and the geographic redistribution of the black population during this period, to 1990-2000 change in the segregation of blacks from whites aggregated over all U. S. metropolitan areas.

## Socioeconomic status and black-white segregation

Many studies have found only modest socioeconomic differences among blacks in their segregation from whites (e.g., Darden and Kamel 2000; Denton and Massey1988; Massey and Fischer 1999).   But studies using recent data have tended to find noticeable socioeconomic status differences among blacks in their segregation from whites (Iceland, Sharpe, and Steinmetz 2005; Iceland and Wilkes 2006; St. John and Clymer 2000); blacks with higher incomes and more education are less segregated from whites than are lower income and less educated blacks. At least some of the discrepancy in results depends on whether segregation is conceptualized as structural segregation between blacks and whites and measured by the index of dissimilarity or as the experience of segregation from the viewpoint of the typical black person as measured by the exposure index (Alba, Logan, and Stults 2000).  Studies measuring segregation with the index of dissimilarity have tended to find blacks of all socioeconomic statuses are highly segregated from whites (Denton and Massey 1988).   However, even using the index of dissimilarity to measure segregation, Iceland and Wilkes (2006) find income, education, and occupation differences in black segregation from whites for 2000 data.  On the other hand, studies measuring segregation with the exposure index have found higher status blacks have greater exposure to whites than lower status blacks (St. John and Clymer 2000) even with earlier (1990) data.  Further, using a technique that, in essence, individualizes census tract data, Alba, Logan, and Stults (2000) found the higher the income and the more education blacks have, the greater the percentage of their neighborhoods that are white (see also Alba and Logan 1993).

Given the socioeconomic status differences in black segregation from whites we just described, an improvement over time in black socioeconomic status must produce a reduction in black segregation from whites even if levels of black segregation from whites don't change at all

within levels of socioeconomic status. Although blacks continue to lag behind whites on indicators of socioeconomic status, they have made considerable improvements in recent decades as lower percentages of blacks now are in the lowest categories of income, occupation and education and higher percentages are in the highest categories (Iceland and Wilkes 2006). For example, tabulations produced by Iceland and Wilkes (2006) for U. S. metropolitan areas show that in 1990 34.5% of blacks age 25 and over had not graduated from high school. In 2000 that percentage had decreased to 24.7%. Similarly, in 1990 only 12.3% of blacks age 25 and over had at least a Bachelor's degree, but in 2000 16.1% had at least a Bachelor's degree. Thus, the component of the black population most segregated from whites decreased as a proportion of the total black population and the component least segregated from whites increased. As a result, there had to be downward pressure on overall black segregation from whites. This change should have resulted in decreases in black segregation from whites within individual metropolitan areas and for blacks as a whole aggregated over all metropolitan areas. Thus, we ask, how much of the decreasing segregation of blacks from whites between 1990 and 2000 can be accounted for by black improvements in socioeconomic status?

**Regional population shifts and black-white segregation**

Black segregation from whites tends to be greatest in the older and larger metropolitan areas of the Northeast and Midwest and least in the newer and smaller metropolitan areas of the South and West (Iceland, Weinberg, and Steimetz 2002). In recent decades the black population has tended to shift geographically from the former to the latter resulting in downward pressure on black segregation from whites aggregated over all metropolitan areas (Logan, Stults, and Farley 2004). As a result, even if black segregation from whites within metropolitan areas had not changed, the segregation of blacks from whites over all U. S. metropolitan areas would have

to have decreased as blacks shifted into metropolitan areas with lower levels of segregation. However, Logan, Stults, and Farley (2004) argue the shift has not been great enough to result in significant reductions in black-white segregation. That is, even by 2000 the majority of blacks continued to live in metropolitan areas with high levels of segregation and a small minority of blacks lived in metropolitan areas with low levels of segregation. Thus, Logan, Stults, and Farley (2004) conclude that in recent decades decreases in segregation within metropolitan areas have contributed more significantly to decreases in overall black-white segregation than has black population redistribution among metropolitan areas. However, they nor anyone else we know of actually have measured the contribution of regional shifts in the black population to reductions in black segregation from whites, much less compared it to reductions in black-white segregation from other sources. Consequently, we ask, to what extent have decreases in black segregation from whites been due to the black geographic redistribution?

**Summary**

In our analysis we will examine the contribution of improvements in the socioeconomic status of blacks and the geographic redistribution of the black population to decreases in black segregation from whites between 1990 and 2000. We will use a method that enables us to decompose 1990-2000 change in black segregation from whites 1) into a component due to changing levels of socioeconomic status, 2) into a component due to changing geographic distribution among metropolitan areas, and 3) into a component due to changing levels of segregation within levels of socioeconomic status and within metropolitan areas. On the bottom line, we will produce a minimum estimate of the contribution of improving black socioeconomic status to decreases in black segregation from whites in the last decade of the 20th century.

**Data and Methods**

For data we use the Neighborhood Change Data Base (NCDB) for 1990 and 2000 normalized for 2000 metropolitan area and census tract boundaries. That is, we use census tract data for the 331 metropolitan areas (MSAs and PMSAs) defined for 2000. The 2000 metropolitan area and census tract boundaries are projected backward for the 1990 data. Thus, any changes in levels of segregation we describe can't be attributed to boundary changes between the 1990 and 2000 censuses. The NCDB was developed by GeoLytics and The Urban Institute with partial funding from the Rockefeller Foundation (GeoLytics 2007). It contains nationwide tract-level data from the 1970, 1980, 1990, and 2000 decennial censuses. GeoLytics applied weighting tables for 1970, 1980, and 1990 to convert past census data to 2000 tract boundaries making it possible to compare census tract data over time without concern for boundary changes.

We begin by calculating the interaction index ($P^*$) (Lieberson 1980) measuring the exposure of blacks to whites across all metropolitan areas in the U. S. for both 1990 and 2000. We focus on the interaction index because it is a crude rate that is the weighted sum of the exposure experienced by subgroups of the black population (like socioeconomic status groups), a property that is essential to our analysis. In contrast, with the index of dissimilarity, the most frequently used measure of segregation, the overall segregation score for a race group such as blacks is not a weighted average of the component class groups (Iceland and Wilkes 2006). In our calculations for 1990 the white population is the total White population and the black population is the total Black/African American population. For 2000 the white population is the White population alone and the black population is the Black/African American population alone or in combination. The equation for the interaction index for a single metropolitan area is:

$$P^* = \text{SUM } (i = 1 \text{ to } N) \ ((b_i/B)(w_i/t_i)), \text{ where}$$

$$b_i = \text{black population in tract } i$$

$$B = \text{total black population in an MSA}$$

$$w_i = \text{white population in tract } i$$

$$t_i = \text{total population in tract } i$$

For a single metropolitan area the interaction index is the proportion of the population that is white in the tract in which the average black person lives.

Weighting the interaction index for each metropolitan area by the proportion of the total U. S. metropolitan black population living in it and summing over all metropolitan areas gives a single interaction index for all metropolitan blacks, that is, for all metropolitan blacks, the proportion white in the census tracts in which the average black lives.  For 1990 this value is 0.37 and for 2000 it is 0.39.  In 1990 metropolitan blacks lived in tracts that were, on average, 37% white and in 2000 they lived in tracts that were, on average, 39% white.  This represents a very modest increase in black exposure to whites.

The interaction index measuring black exposure to whites is limited in value by the proportion of a metropolitan area's population that is white.  And, between 1990 and 2000 the racial/ethnic composition of the U.S. population changed considerably, resulting in whites becoming a smaller proportion of the population.  This was especially true for the population living in metropolitan areas.  In our data with 1990 metropolitan areas and metropolitan area boundaries normalized to 2000, 79% of the U. S. metropolitan population was white in 1990 and 73% was white in 2000.  Also, this trend clearly pertains to the metropolitan areas in which most blacks live as Table 1 shows the percent of the population white in 1990 and 2000 for the 20 metropolitan areas with the largest black populations in 1990.  For example, consider New York,

the metropolitan area with the largest black population in 1990. In 1990 56.3% of New York's population was white but in 2000 only 48.8% was white (a reduction of 7.5 percentage points). The repercussion of this trend for our concern is that between 1990 and 2000 there was considerable downward pressure on black exposure to whites as whites became a smaller share of the population in metropolitan areas across the country.

Accordingly, to take this into account, most of our analysis is based on a standardized version of the interaction index. That is, before weighting the interaction index for each metropolitan area and summing over all metropolitan areas, we first divide the interaction index for each metropolitan area by the proportion of the population in the metropolitan area that is white. This denominator would be the metropolitan area value for the interaction index if all racial/ethnic groups in the MSA were distributed into tracts in proportion to their overall representation in the population or, in other words, the maximum value of the interaction index for a metropolitan area. Thus, the standardized interaction index measures exposure as a comparison of actual exposure to "potential" exposure and we think it is a more appropriate measure of exposure for comparisons over time. Weighting the standardized interaction index for each metropolitan area by the proportion of the total U. S. metropolitan black population living in it and summing over all metropolitan areas gives a value of 0.50 in 1990 and a value of 0.56 in 2000. In comparison to "potential" exposure to whites, blacks had greater exposure to whites in 2000 than in 1990, which we interpret as a decrease in black segregation from whites in the metropolitan U. S., an interpretation consistent with viewing segregation from the perspective of the typical black person.

The main part of our analysis utilizes the method of decomposition of the difference in two rates into its components as developed by Kitagawa (1955). This method allocates a

difference in two rates into parts that are attributable to differences in composition and to differences in subgroup rates. In our analysis we will decompose the difference between the 1990 level of exposure and the 2000 level of exposure into a component that is due to changing class composition among blacks, a component that is due to the changing geographic distribution of blacks, and a residual. In this case, the residual represents the difference in rates that is due to changing levels of black exposure to whites within classes within metropolitan areas. It might also include other changes in the composition of the black population that are related to black/white segregation. Unfortunately, because within metropolitan areas census tract data are at most cross-classified by race and one other factor at a time, it is impossible for us to simultaneously consider additional composition changes with this method other than to note their likely presence in the residual.

We use level of education completed by blacks age 25 and over as our measure of socioeconomic status, collapsing levels into four categories: less than a high school education, high school education, some college but not a four-year degree, and four-year college degree or higher (St. John and Clymer 2000). We focus on level of education completed for two reasons. First, there are greater differences in black segregation from whites among socioeconomic status levels defined on the basis of education than on other dimensions of socioeconomic status (Iceland and Wilkes 2006). And second, the categories of education for which census tract data are presented remain constant and fairly comparable over time unlike the categories of income, some of which don't remain the same between censuses and even when they do inflation makes comparisons of them problematic.

Within each metropolitan area we calculate the exposure of blacks with each of these four levels of education to whites . Because the census tract education data pertain to the population

age 25 and over, we recalculate the overall exposure of blacks to whites for each metropolitan area only for blacks of this age group. Within a metropolitan area the interaction index measuring the exposure of blacks age 25 and over to whites is the weighted sum of the exposure of blacks without high school degrees to whites, the exposure of blacks with high school degrees to whites, the exposure of blacks with some college but no four-year degree to whites, and the exposure of blacks with four-year college degrees or greater to whites. We standardize the interaction index measuring the exposure of blacks age 25 and over to whites and the interaction indices for each of the four education groups before executing the decomposition analysis.

Thus, the decomposition analysis utilizes the following information for both 1990 and 2000. That is for each metropolitan area we calculate:

1. the standardized interaction index for blacks age 25+,

2. the number of blacks age 25+,

3. the standardized interaction index for each of four education groups, and

4. the number of blacks age 25+ in each of four education groups.

In addition, aggregated across all metropolitan areas for both 1990 and 2000 we calculate:

1. the standardized interaction index for blacks age 25+ (the standardized interaction index for blacks age 25+ for each metropolitan area weighted by the proportion of all metropolitan blacks age 25+ living in a metropolitan area and summed over all metropolitan areas),

2. the total number of blacks age25+, and

3. the total number of blacks age 25+ in each of four education groups.

**Results**

We begin by looking at interaction indices for blacks for 1990 and 2000 in Table 2. We already have presented the first two sets of interaction indices in this table. These indices show that between 1990 and 2000 there were modest increases in black exposure to whites. The second two sets of indices pertain to the exposure of blacks age 25 and over to whites. We present them because they are relevant to the decomposition analysis based on education data for the black population age 25 and over. They are very similar to the indices for the total black population. It is interesting to note black exposure to whites, measured with the unstandardized interaction index for blacks age 25 and over, did not change between 1990 and 2000. This total absence of change can be attributed to whites becoming a smaller share of the population in metropolitan areas between 1990 and 2000. The standardized indices for the black population age 25 and over, 0.49 in 1990 and 0.54 in 2000, demonstrate increased black exposure to whites when taking into account this demographic shift. These indices will be the subject of the decomposition analysis to follow.

Table 3 shows interaction indices measuring black exposure to whites calculated separately by level of education aggregated over all metropolitan areas. Both the unstandardized and the standardized indices show a clear relationship between social class and black exposure to whites. The more educated blacks are the greater their exposure to whites. For example, the unstandardized indices show that in 1990 and 2000 the typical black person with a college degree in the metropolitan U. S. lived in a neighborhood that was 46% white in contrast to the typical black person who had not graduated from high school, who lived in a neighborhood that

was 31% white in 1990 and 32% white in 2000. Thus, it is clear an increase in the class status of blacks between 1990 and 2000 must contribute to an increase in black exposure to whites. The unstandardized indices show virtually no change in black exposure to whites between 1990 and 2000. This is due to the white population becoming a smaller share of the population in most metropolitan areas over the decade. In contrast, the standardized indices show that within level of education there was increased exposure to whites, relative to the maximum potential, at all levels of education. For example, the standardized index for blacks with college degrees increased from 0.63 to 0.68 and the standardized index for black who have not graduated from high school increased from 0.42 to 0.46.

Between 1990 and 2000 the black population made considerable improvements in level of education (Table 4). In 1990 over one-third (34.5%) of blacks age 25+ in U. S. metropolitan areas had less than a high school education, the education level with the least exposure to whites. But by 2000 only a quarter of blacks age 25+ (25.8%) had not graduated from high school. Conversely, the percentage of blacks age 25+ who had graduated from high school increased from 27.9% to 29.1%, the percentage who had attended but not graduated from college increased from 25.4% to 29.7%, and the percentage who had graduated from college increased from 12.3% to 15.4%; groups with greater exposure to whites. Thus, between 1990 and 2000 there was an upward shift in level of education that had to contribute to increased black exposure to whites over all metropolitan areas.

Table 5 presents the level of black exposure to whites for metropolitan areas by rate of black population growth between 1990 and 2000. The top half of Table 5 shows the 20 metropolitan areas with the greatest percentage increase in the black population between 1990 and 2000 along with their 1990 standardized interaction indices. The bottom half shows the 20

metropolitan areas with the least percentage increase in black population between 1990 and 2000 and their 1990 standardized interaction indices.  Clearly, blacks in the metropolitan areas with the fastest rates of black increase between 1990 and 2000 began the decade with greater black exposure to whites than those in the metropolitan areas with the slowest rates of black increase. For example, in stark contrast are the metropolitan areas of Laredo, TX and New York, NY.  The black population in Laredo grew by over 1100% between 1990 and 2000 and the standardized interaction index for Laredo in 1990 was so high it rounded to 1.00.  This means in 1990 blacks in Laredo lived in neighborhoods with the same proportion white as in the metropolitan area as a whole.  In New York the black population grew by only 10% between 1990 and 2000 and the standardized index for 1990 was only 0.35, indicating in 1990 blacks in New York lived in neighborhoods only 35% as white as the metropolitan area as a whole.  Not shown in Table 5 is that the correlation between percent black increase between 1990 and 2000, and the 1990 standardized interaction index is 0.416.  Thus, between 1990 and 2000 the black population tended to shift away from metropolitan areas with low exposure to whites and into metropolitan areas with higher exposure.  However, it is important to note the metropolitan areas in which the black population grew the fastest between 1990 and 2000 had very small black populations to begin the decade, such that their rapid increases in black population tend to represent fairly small increases in population to a small base.  Thus, it is uncertain from this information whether the shift in black population toward these metropolitan areas could have had a noticeable impact on overall black exposure to whites.

The results of the decomposition analysis are presented in Table 6.  The standardized interaction index weighted and summed across all metropolitan areas increased from 0.4945 in 1990 to 0.5423 in 2000, an increase of 0.0478.  The decomposition shows that 0.0207 of the

0.0478, 43.3% of the increase, was due to change in the black education distribution and to the redistribution of blacks among metropolitan areas, 25.9% due to the shift in black education distribution, 16.7% due to the redistribution of blacks among metropolitan areas, and 0.6% due to the joint effect of both.  Thus, one-quarter of the increased black exposure to whites between 1990 and 2000, as measured by the standardized interaction index, was due to improvements in the level of black education and one-sixth of the increase was due to the redistribution of blacks among metropolitan areas.  Of the 1990 to 2000 increase of 0.0478, 0.0271, or 56.7%, is residual, that is, due to changes in black exposure to whites within levels of education and within metropolitan areas.  Some of this residual could be due to shifts in the distribution of the black population other than by level of education and some of it could be due to increased exposure unrelated to changes in the composition of the black population.

[We will extend the analysis another step by examining the effect of increasing black education on black exposure to whites as a single factor in a decomposition of rates for individual metropolitan areas, but we have not done so yet.  This analysis will show the extent to which improving black education led to greater black exposure to whites between 1990 and 2000 is uniform across metropolitan areas.  In addition, we will be able to identify the specific metropolitan areas most responsible for producing the finding that improving black education led to increased exposure.]

## Conclusion

In this paper we sought to answer two questions.  1) To what extent did improvements in black socioeconomic status between 1990 and 2000 contribute to reductions in black segregation from whites in this period?  And, 2) to what extent did the redistribution of blacks away from the larger and older metropolitan areas of the Northeast and Midwest between 1990 and 2000

contribute to 1990-2000 reductions in black-white segregation?  Using a standardized version of the interaction index to measure black exposure to whites aggregated across all metropolitan areas for 1990 and 2000 and Kitagawa's (1955) method for decomposing differences in rates, we find that 25% of the increased exposure of blacks to whites between 1990 and 2000 can be attributed to improvements in the level of black education and 17% can be attributed to the redistribution blacks among metropolitan areas.  These results are consistent with the structural assimilation model of ethnic/minority incorporation.  That is, as the black population became more similar to the white population in terms of socioeconomic status and regional geographic distribution, blacks increasingly shared neighborhoods with whites.  That the overall standardized interaction index for all metropolitan blacks in 2000 is only 0.54, indicating blacks, on average, live in neighborhoods only half as white as the metropolitan areas in which they reside, is clear evidence that American society is far from color blind when it comes to place of residence.  However, our results suggest further improvements in black socioeconomic status and disproportional black population growth in the smaller metropolitan areas of the South and West will contribute to a society in which blacks have increasing opportunities to interact with whites.

Table 1.  Percent of the population white in 1990 and 2000 in the 20 MSAs with the largest black
populations in 1990.

| MSA | % white, 1990 | % white, 2000 |
|---|---|---|
| New York, NY | 56.5 | 48.8 |
| Chicago, IL | 71.1 | 65.8 |
| Washington, DC, MD, VA, WV | 67.4 | 60.0 |
| Los Angeles-Long Beach, CA | 56.9 | 48.6 |
| Detroit, MI | 75.5 | 71.2 |
| Philadelphia, PA, NJ | 76.7 | 72.2 |
| Atlanta, GA | 72.2 | 63.0 |
| Baltimore, MD | 71.8 | 67.4 |
| Houston, TX | 66.5 | 61.0 |
| New Orleans, LA | 62.2 | 57.3 |
| Newark, NJ | 71.5 | 65.9 |
| St. Louis, MO, IL | 81.6 | 78.3 |
| Dallas, TX | 73.4 | 67.2 |
| Memphis, TN, AR, MS | 58.0 | 52.9 |
| Norfolk-Virginia Beach-Newport News, VA | 68.2 | 62.5 |
| Miami, FL | 73.1 | 69.7 |
| Cleveland-Lorain-Elmyria, OH | 80.5 | 77.0 |
| Oakland, CA | 66.0 | 55.3 |
| Richmond-Petersburg, VA | 68.8 | 64.9 |
| Birmingham, AL | 70.5 | 67.3 |

In 1990 white population is total white population and black population is total black population.

In 2000 white population is white population alone and black population is black population alone or in combination.

1990 MSAs and MSA boundaries are normalized to 2000.

Table 2. Interaction indices measuring black exposure to whites, 1990 and 2000, weighted and summed over all metropolitan areas.

|  | 1990 | 2000 |
|---|---|---|
| Unstandardized $P^*$ for total black population[1] | 0.37 | 0.39 |
| Standardized $P^*$ for total black population[1] | 0.50 | 0.56 |
| Unstandardized $P^*$ for black pop., age 25+[2] | 0.37 | 0.37 |
| Standardized $P^*$ for black pop., age 25+[2] | 0.49 | 0.54 |

1. In 1990 the white population is the total white population and the black population is the total black population.  In 2000 the white population is the white population alone and the black population is the black population alone or in combination.

2. The black population comes from tables showing education by race for the population age 25+.  In 1990 the white population is the total white population and in 2000 the white population is the white population alone.

1990 MSAs and MSA boundaries are normalized to 2000.

Table 3. Interaction indices measuring black exposure to whites by level of education, 1990 and 2000, weighted and summed over all metropolitan areas.

| | 1990 | 2000 |
|---|---|---|
| Unstandardized P[*] | | |
| LT high school | 0.31 | 0.32 |
| High school | 0.36 | 0.35 |
| Some college | 0.41 | 0.40 |
| College degree | 0.46 | 0.46 |
| Standardized P[*] | | |
| LT high school | 0.42 | 0.46 |
| High school | 0.48 | 0.51 |
| Some college | 0.55 | 0.58 |
| College degree | 0.63 | 0.68 |

The black population comes from tables showing education by race for the population age 25+. In 1990 the white population is the total white population and in 2000 the white population is the white population alone.

1990 MSAs and MSA boundaries are normalized to 2000.

Table 4. Black population age 25+ by level of education, 1990 and 2000, over all U. S. metropolitan areas.

| Education level | 1990 | 2000 |
|---|---|---|
| LT high school | 4,971,547 (34.5) | 4,414,060 (25.8) |
| High school | 4,024,267 (27.9) | 4,985,724 (29.1) |
| Some college | 3,654,638 (25.4) | 5,079,742 (29.7) |
| College degree | 1,766,019 (12.3) | 2,635,216 (15.4) |
| Total | 14,416,471 (100.0) | 17,114,742 (100.0) |

The black population comes from tables showing education by race for the population age 25+.

1990 MSAs and MSA boundaries are normalized to 2000.

Table 5. MSAs with largest/smallest increases in black population, 1990-2000, and 1990 standardized interaction indices.

| Metropolitan area | Pct. increase | Std. P[*] |
|---|---|---|
| Laredo, TX | 1120.2 | 1.00 |
| Provo-Orem, UT | 840.8 | 1.00 |
| Wausau, WI | 727.3 | 1.00 |
| Medford-Ashland, OR | 498.8 | 0.98 |
| Bismarck, ND | 470.1 | 1.00 |
| Rochester, MN | 451.2 | 0.91 |
| Fargo-Moorhead, NDMN | 386.1 | 0.99 |
| Appleton-Oshkosh,-Neenah, WI | 385.6 | 0.96 |
| Sioux Falls, SD | 320.8 | 0.98 |
| St. Cloud, MN | 299.8 | 0.99 |
| McAllen-Edinburg-Mission, TX | 289.4 | 1.00 |
| Dubuque, IA | 288.2 | 0.99 |
| Green Bay, WI | 286.0 | 0.80 |
| Sheboygan, WI | 267.1 | 0.95 |
| Manchester, NH | 265.1 | 0.98 |
| Bellingham, WA | 256.2 | 0.98 |
| Fayetteville-Springdale-Rogers, AR | 235.2 | 0.94 |
| Greeley, CO | 224.6 | 0.97 |
| LaCrosse, WIMN | 222.8 | 0.97 |
| Boise City, ID | 218.1 | 0.99 |
|  |  |  |
| Salinas, CA | -17.4 | 0.85 |
| San Francisco, CA | -10.3 | 0.62 |
| Anniston, AL | -0.70 | 0.70 |
| Jacksonville, NC | 1.3 | 0.91 |
| Grand Forks, NDMN | 1.4 | 0.93 |
| Los Angeles-Long Beach, CA | 3.7 | 0.47 |
| Longview-Marshall, TX | 6.0 | 0.77 |
| Galveston, TX | 6.2 | 0.62 |
| Danville, VA | 6.9 | 0.85 |
| Steubenville-Weirton, OHWV | 8.1 | 0.84 |
| Stamford-Norwalk, CT | 8.5 | 0.70 |
| Alexandria, LA | 8.5 | 0.57 |
| Odessa-Midland, TX | 9.3 | 0.69 |
| San Jose, CA | 9.6 | 0.87 |
| Tyler, TX | 9.8 | 0.65 |
| Glens Falls, NY | 10.4 | 0.74 |
| Gary, IN | 10.4 | 0.22 |
| New York, NY | 10.7 | 0.35 |
| Benton Harbor, MI | 11.5 | 0.42 |
| Oakland, CA | 11.6 | 0.50 |

1990 MSAs and MSA boundaries are normalized to 2000.
Table 6. Decomposition of change in standardized interaction indices, 1990-2000.

| | | |
|---|---|---|
| 1990 standardized exposure index | | 0.4945 |
| 2000 standardized exposure index | | 0.5423 |
| Difference | | 0.0478 |
| | | |
| Combined effects of change in education and change in geographic distribution | | 0.0207 |
| Change in education | 0.0124 | |
| Change in geographic distribution | 0.0080 | |
| Joint | 0.0003 | |
| Residual | | 0.0271 |

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