Racial Inequality in America: Neighborhoods versus Households*

Chad R. Farrell
Department of Sociology
University of Alaska Anchorage

Glenn Firebaugh
Department of Sociology
Pennsylvania State University

February 28, 2011

*Authors contributed equally. Contact information: Chad R. Farrell, Department of Sociology, 3211 Providence Drive, University of Alaska Anchorage, Anchorage, AK 99508 or afcrf@uaa.alaska.edu; Glenn Firebaugh, Department of Sociology, 211 Oswald Tower, Pennsylvania State University, University Park, PA 16802 or firebaugh@pop.psu.edu.

Racial Inequality in America: Neighborhoods versus Households
Authors: Chad R. Farrell and Glenn Firebaugh
Paper presented at the annual meeting of the Population Association of America, March 31, 2011 (Washington, D.C.)
PAA 2011 Session 12 "Racial and Ethnic Inequality"
Organizer: Richard Alba
Discussant: Arthur Sakamoto

Short Abstract (143 words)

Racial neighborhood inequality (*RNI)* refers to the degree to which residential environments vary in quality for different race and ethnic groups. This study introduces the index (*RNI/RHI)-1,* where *RNI* and *RHI* (racial household inequality) are both measured by the Gini coefficient, to gauge how much of the observed racial inequality at the neighborhood level arises from noneconomic racial segregation (when income is the only factor that sorts groups into neighborhoods, *RNI = RHI* as measured by the Gini). We find large positive index values for whites vs. blacks and for whites vs. Hispanics in the 100 largest U.S. metropolitan areas, indicating (1) that racial inequality in these areas is substantially greater at the neighborhood level than at the household level and (2) that factors other than income play a major role in placing minorities in poorer neighborhood environments than those experienced by whites.

Longer Abstract

This study uses 1980-2000 census data to compare racial neighborhood inequality (*RNI*) to racial neighborhood segregation and racial household inequality (*RHI*) for the 100 largest metropolitan areas in the United States. By comparing the *RNI* Gini to the *RHI* Gini we can assess the degree to which *RNI* is due to *RHI*. We find that *RNI* is much larger than *RHI*, indicating that factors other than income play a large role in placing minorities in poorer neighborhood environments than those experienced by whites.

We also use the Gini coefficient to compare *RNI* to racial neighborhood *segregation*. The comparison is telling because, as we demonstrate in the paper, racial neighborhood segregation sets the ceiling for *RNI* as measured by the Gini coefficient. We find that changes in *RNI*—decreasing between black and white residents and increasing between white and Hispanic residents—have been more dramatic than changes in segregation. Thus, *relative to its potential*, racial neighborhood inequality has been increasing for Hispanics and whites while declining for blacks and whites.

Racial neighborhood inequality—the degree to which various racial and ethnic groups inhabit disparate local economic environments—has long been recognized as a critical component of racial stratification in the United States (Myrdal 1944; Du Bois 1899). Racial neighborhood inequality that persists to the present day can be attributed in part to enduring racial differences in household income. If household purchasing power varies by race then residential destinations and neighborhood qualities will likely follow suit. However, scattered research evidence suggests that racial differences in income environments might be substantially greater at the neighborhood level than at the household level. Based on our calculations, for example, only one of every eight whites in America lived in a neighborhood (census tract) in 2000 where the poverty rate was as high as or higher than the poverty rate where the average (median) black lived. Because one's local income environment is positively associated with access to resources and services (e.g., good schools) and inversely associated with exposure to the hazards of urban life (e.g., violent crime), racial neighborhood disparities may serve as the wellspring for many other types of racial disparities in American society.

This study uses 1980-2000 census data to compare racial neighborhood inequality to racial neighborhood segregation and racial household inequality for the 100 largest metropolitan areas in the United States. It is to our knowledge the first to study to compare the magnitude and trends in racial neighborhood inequality to the magnitude and trends of racial segregation and racial housing inequality for a significant number of American metropolitan areas. Both comparisons are strategic. As we show below, racial neighborhood segregation provides a ceiling for racial neighborhood inequality as measured by the Gini. Thus, by comparing the two we can investigate the size of racial neighborhood inequality relative to how large it could be. Our second comparison focuses on racial neighborhood inequality relative to racial inequality at the

household level. We hypothesize that racial neighborhood inequality is the much larger of the two – and for that reason alone it merits more scholarly attention.

Why Study Racial Neighborhood Inequality?

Racial neighborhood inequality (hereafter *RNI*) refers to socioeconomic differences in the neighborhoods where different racial or ethnic groups live. *RNI* is distinct from (though often conflated with) *racial neighborhood segregation*, which refers to the spatial distribution of groups across neighborhoods rather than their disparate localized income environments. It is also distinct from *racial household inequality (RHI)*, which refers to racial differences in socioeconomic characteristics (e.g., poverty status), regardless of where specific groups reside. Although racial household inequality and racial neighborhood segregation have been intensely studied, we have limited understanding about the magnitude, trend, and causes of racial neighborhood inequality in the United States. This is surprising given that racial neighborhood inequality is posited as one of the more pernicious consequences of racial segregation (Massey and Denton 1993).

The case for studying *RNI* is straightforward: Minorities are much more likely to live in poor neighborhoods, and living in poor neighborhoods has adverse consequences for one's life chances and for the life chances of one's children (e.g., higher rates of teenage pregnancy and school dropout [Harding 2003], higher rates of violent juvenile crime [Ludwig, Duncan & Hirschfield 2001], greater social isolation [Rankin and Quane 2000], and lower levels of life satisfaction [Firebaugh and Schroeder 2009]). Although there is a huge literature on racial segregation in the United States, it could be argued that racially homogeneous neighborhoods *per se* is not what matters – what matters is whether this homogeneity has pernicious consequences.

Quoting Alba et al. (2008), "While segregation indices can inform us about the extent to which members of different groups live in different neighborhoods, they cannot tell us directly about the 'qualities' of the neighborhoods in which group members reside" (p. 14).

We make three contributions in this paper. The first is descriptive: To provide more useful and comprehensive statistics on the magnitude of the disparities in the neighborhood income environments to which whites, blacks, and Hispanics are exposed. Although it is well-established that, on average, blacks and Hispanics live in poorer neighborhoods than whites do, *RNI* is rarely quantified (see the Pew Neighborhoods study [Sharkey 2009] for an exception). Unlike *RHI*, which has been closely monitored, we have limited understanding of the magnitude, trend, and causes of *RNI* in the United States. Essentially what we know about *RNI* is that it exists, and is probably large. Progress has been slowed by the failure to think of racial disparities in neighborhood income conditions as a type of inequality that can be measured as such (making it easy to compare to inequality at other levels). We remedy this state of affairs by using a standard inequality measure to "compare like with like" (Firebaugh 2008). A novel application of the venerable Gini index permits us to compare directly the size and trends in the three different types of inequality: racial neighborhood inequality, racial household inequality, and racial neighborhood segregation.[1]

Our second contribution is the Gini-based *RNI/Rseg* index, which represents the size of *RNI* relative to its potential as set by racial neighborhood segregation. When this index approaches its maximum (*RNI/Rseg* = 1) it indicates that racial neighborhood inequality has reached its highest potential level for a specific metropolitan area. Declining *RNI/Rseg* index values indicate that the processes underlying racial neighborhood inequality have come

[1] Segregation can be thought of as the disproportionate distribution of groups across organizational units (here, neighborhoods) – that is, segregation can be thought of as a type of inequality.

uncoupled from those driving racial segregation. We provide early evidence on how *RNI/Rseg* varies across U.S. metro areas and on how it changed from 1980-2000.

Our third contribution is the introduction of the (*RNI/RHI)-1* index. This index indicates how much of the racial disparity in neighborhood income contexts is due to *non-income-based* neighborhood segregation (racial segregation due, for example, to housing discrimination or to race-based neighborhood preferences). A positive index value indicates that factors other than income play a role in placing minorities in poorer neighborhood environments than those experienced by whites (the comparison group); and the greater the role played by those factors, the larger the index value. To our knowledge we are the first to use this index to investigate racial stratification in the United States.

Using the Gini Index to Measure Inequality and Segregation

For our purposes here, a measure of inequality should have these characteristics:

1. *Scale-invariance*, so that our results do not depend on the metric used (e.g., whether income is measured in dollars or thousands of dollars).

2. *Satisfaction of the transfer principle*, that inequality declines when income is transferred from rich to poor, and increases when income is transferred from poor to rich.

3. *Doubles as a segregation measure.* For our purposes here, it is critical to use a measure of inequality that can also be used to measure segregation, so that we are comparing like with like when we compare *RNI* to racial neighborhood segregation.

4. *Compositional-invariance*, that is, the measure should not be sensitive to changes in the relative sizes of groups (James and Taeuber 1985). This property is especially important in this study because of the rapidly-changing racial and ethnic composition of neighborhoods in many metro areas in America.

As is well-known (e.g., Allison 1978; Firebaugh 2003), the Gini coefficient meets the first two criteria. The Gini also satisfies the third criterion; as Duncan and Duncan (1955) noted more than a half century ago (see also Hutchens 2004), the Gini can be used to measure

segregation as well as inequality. Finally, unlike many other measures of inequality or segregation (Reardon and Firebaugh 2002), the Gini coefficient is compositionally-invariant when both axes are cumulative population percentages. Because the Gini meets all four criteria above, it is our measure of choice for this analysis.

Inequality exists when there is a disproportionate distribution of some quantity *Y*, such as income, across units. Units typically are individuals, households, or socially meaningful groups, such as those defined by race/ethnicity. Complete *equality* (Gini = 0) exists when *Y* is distributed proportionately across all units whereas complete *inequality* (Gini = 1) exists when one unit monopolizes *Y*. In the case of inequality among individual households, complete inequality exists when one household owns it all. In the case of *group* inequality (such as *racial* household inequality), complete inequality (Gini = 1) exists between two groups when there is no overlap in the distribution of *Y* for the groups. In other words, complete *RHI* as measured by the Gini exists when members of one group all live in richer households than do the members of another group. For *RNI*, complete inequality (Gini = 1) is present when all members of one group reside in richer neighborhoods than all members of another group.

With respect to segregation, complete racial segregation (Gini = 1) at the neighborhood level means that all neighborhoods are racially homogeneous, and complete integration (Gini = 0) means that the racial composition of each neighborhood mirrors the racial composition for the region as a whole. In other words, Gini measures of segregation capture the inequality or "unevenness" (Massey and Denton 1988) in the distribution of groups across spatial or organizational units.

Racial Neighborhood Inequality Relative to Racial Neighborhood Segregation (*RNI*/*Rseg*)

In this section we prove that, as measured by the Gini, the level of *RNI* cannot exceed the level of racial neighborhood segregation in a region. This result is important, because it enables us to assess the magnitude of *RNI* relative to its potential. To set the stage for that proof, note that Gini inequality can be depicted graphically with the Lorenz curve (Lorenz 1905; Gastwirth 1972). Lorenz curves plot one cumulative proportion by another, where the units have been ordered on the basis of some criterion, such as income. In the case of household income inequality, for example, households are ranked from low to high on household income, and the Lorenz curve plots the cumulative population proportion (x-axis) by the cumulative income proportion (y-axis). If all households have the same income, the curve will trace a 45-degree straight line on the graph. Similarly, the absence of racial segregation or inequality for two groups would produce a 45-degree line in a graph where the x-axis is the cumulative percentage of one group and the y-axis is the cumulative percentage of the other group. Because inequality is ubiquitous, with real data the Lorenz curve is always below the 45-degree line of equality when the poorer group is used as the x-axis. The Gini is the size of the area between Lorenz curve and the line of equality, divided by the total area of the lower right triangle (examples below).

Suppose we want to compare *RNI* and racial segregation for white and black residents in Atlanta and Milwaukee.[2] As depicted in Figures 1 and 2, the x- and y-axes are the same for *RNI* and *Rseg*. The curves are different because they are based on different rankings of the neighborhoods – racial segregation ranks neighborhoods on the basis of race whereas *RNI* ranks neighborhoods on the basis of the neighborhood poverty rate. For segregation, it does not matter which group we select for the x-axis and which we select for the y-axis, but for inequality we

[2] We rely on updated OMB metro boundary definitions (Frey et al. 2004).

need to choose the poorer group for the x-axis, which is cumulative percentage of blacks in this instance. For the Lorenz segregation curve, tracts were ranked from highest to lowest in terms of the proportion black. Thus racially mixed neighborhoods are in the middle of the graph and the most racially homogeneous are at either end of the x-axis, with predominately black neighborhoods on the left and predominately white neighborhoods on the right.[3] For the Lorenz *RNI* curve, tracts were ranked from highest to lowest in terms of the tract poverty rate. High poverty tracts are found on the left side of the x-axis and poverty rates decrease as one moves to the right.

Now we can consider the question that we set out to answer in this section: Given these axes, what criterion for ranking neighborhoods would yield the greatest area between the Lorenz curve and the line of equality (and thus the largest Gini)? The answer is race itself. To demonstrate, let $p_{bj}(a)$ be the proportion of blacks with trait a in the j^{th} neighborhood and let $p_{wj}(a)$ be the proportion of whites with trait a in the j^{th} neighborhood. Suppose a is race (black or white), so we rank the J neighborhoods from 1 (most homogeneously black) to J (most homogeneously white) on the basis of $p_{bj}(a)$, producing these rankings for the neighborhoods:

Rank on $p_{bj}(a)$: $1 \geq 2 \geq 3 \ldots \geq J\text{-}2 \geq J\text{-}1 \geq J$

Rank on $p_{wj}(a)$: $J \geq J\text{-}1 \geq J\text{-}2 \geq \ldots \geq 3 \geq 2 \geq 1$

This ranking maximizes the *difference* in the neighborhood rankings for blacks and whites. No other ranking of neighborhoods would produce a greater black-white difference in the rankings, and any other criterion a (such as the poverty rate in the neighborhood) would produce a difference as large only if lining up neighborhoods on that new criterion produced rankings identical to those above.

[3] In this two-group framework, the identification of homogeneous or mixed tracts relies solely on the coresidence (or lack thereof) of whites and blacks irrespective of other groups.

[FIGURES 1 AND 2 ABOUT HERE]

In short, racial Gini inequality in *racial environments* sets the upper limit for racial Gini inequality in *income environments*. This is illustrated in Figures 1 and 2 by the fact that the Lorenz curves for *RNI* are shallower than those for segregation. We can see, however, that the gaps between the *RNI* and segregation curves vary greatly for Atlanta and Milwaukee. We operationalize these gaps using the *RNI/Rseg* index, which refers to the ratio of *actual RNI* to its maximum *potential*. Despite their similarly high segregation levels, Atlanta is characterized by less racial neighborhood inequality relative to segregation (*RNI/Rseg* = .629) than is Milwaukee (*RNI/Rseg* = .895). In other words, black and white residents tend to live in separate spaces in both Atlanta and Milwaukee, but in Milwaukee (more than in Atlanta) the residential spaces occupied by blacks are *poorer* than the residential spaces occupied by whites – *separate and unequal, not just separate.* These two observations – that neighborhood segregation sets the upper limit for Gini *RNI*, and that the *RNI*/*Rseg* index varies substantially across metro areas – are, to our knowledge, new. At the least we can say that *RNI* and the *RNI*/*Rseg* index deserve more scholarly attention because, in the final analysis, much of the concern with racial segregation is that it contributes to racial disparities in living conditions and life chances.

The first objective of our study, then, is to compare the *RNI* Gini with the *Rseg* Gini for white, black, and Hispanic residents of the 100 largest U.S. metro areas in 1980, 1990, and 2000. We are interested in determining how large the *RNI*/*Rseg* index is and how much it varies by pairs of racial and ethnic groups over time and across metro areas.

Comparing Racial Inequality at Two Levels: The Neighborhood-Household Index

The second objective of our study is to compare *RNI* to racial household inequality for the 100 largest U.S. metro areas in 1980, 1990, and 2000. What we want to know is whether the income environments of racial groups differ more at the household level or at the neighborhood level. If income environments for groups differ more at the neighborhood level it means that income is not the only factor sorting groups into neighborhoods. The Pew Neighborhoods study (Sharkey 2009) provides a step in that direction, finding high levels of black-white neighborhood inequality in the United States. We extend these results in several ways. First, we examine groups other than blacks and whites. Second, while the Pew study uses survey data based on the United States as a whole, we use census data to look at metropolitan areas separately. Thus we can investigate how neighborhood inequality varies over time and from metro to metro in the United States. Third, for each of the 100 largest U.S. metros, we use the Gini index to compare inequality at the neighborhood level to inequality at the household level. In comparing *RNI* to *RHI*, it is important to note that *RNI could* be the lower of the two forms of inequality. To illustrate, imagine that all black households were poorer than all white households, so Gini *RHI* = 1.0. In that case, if there were any black-white integration at all – that is, if there were even one neighborhood where blacks and whites coresided - *RNI* would be less than unity and, thus, less than *RHI*.

That said, we expect *RNI* to be substantially larger than *RHI* in American metropolitan areas. To see why, consider this question: When would Gini *RNI*=Gini *RHI*? Suppose race was unrelated to residence independent of income, so households with equal income on average reside in equal-income neighborhoods regardless of their race. If so, we would get the same relative ranking – and thus the same Lorenz curve – for two races whether we ranked them on

the basis of household income or neighborhood income. In short, Gini *RNI*=Gini *RHI* when equal-income blacks and whites live in equal-income neighborhoods (on average).

On the other hand, when households are sorted into neighborhoods based on race as well as income, Gini *RNI* ≠ Gini *RHI*. In particular, when members of the poorer group tend to live in more disadvantaged neighborhoods than equal-income members of a richer comparison group, then *RNI/RHI > 1.* To center this ratio on zero for *RNI=RHI*, we subtract one from the ratio to create the index (*RNI/RHI)-1,* which we refer to as the *neighborhood-household inequality index*. The sign and size of the index is important because of what it tells us about the contribution of non-income factors to racial neighborhood disparities in America. Large positive index values indicate that non-income factors contribute heavily to the poorer neighborhood environments experienced by minority groups in America.

Of course we already know that racial neighborhood segregation is determined by factors other than income (Charles 2003; Ross and Turner 2005; Yinger 1995). What the neighborhood-household inequality index adds is a convenient summary statistic for evaluating how the importance of non-income determinants of racial segregation varies across metropolitan areas, and how much the importance of these determinants is declining (or rising) over time.

Results for the *RNI/Rseg* Index

Table 1 presents the average Gini coefficients for *RNI* and segregation for three group combinations in the 100 largest metropolitan areas (hereafter Metro-100) from 1980 to 2000. The first finding that jumps out is the magnitude of *RNI* for blacks and whites. While this finding was foreshadowed by the findings of the Pew Neighborhoods study, the Pew study did not use standard inequality measures. The Ginis in Table 1 indicate that the levels of black-white

poverty-based *RNI* in America are similar to the level of income inequality in the world's most unequal countries (World Bank 2011).

The second finding of note is that *RNI* covaries over time with segregation. Consistent with prior research (Farley and Frey 1994; Logan, Stults, and Farley 2004) we observe declining black-white and black-Hispanic segregation from 1980 to 2000, and rising Hispanic-white segregation. What is new here is our finding that *RNI* tended to move in tandem with these segregation trends, declining with the 1980-2000 declines in black-white segregation and in black-Hispanic segregation, and increasing with the Hispanic-white increase in segregation.[4] The finding that *RNI* changes with racial segregation nonetheless should not surprise us because, as demonstrated above, segregation sets an upper limit on *RNI*.

[TABLE 1 ABOUT HERE]

What *is* surprising is the magnitude of the changes in *RNI* – although *RNI* and racial segregation track together, changes in *RNI* are more dramatic, especially in the case of black-Hispanic segregation and *RNI*. While black-Hispanic neighborhood segregation in the Metro-100 declined on average by about 12 percent from 1980 to 2000, Hispanic-black neighborhood inequality declined by more than half as measured by the Gini.

Another finding that stands out is that the *RNI/Rseg* index values for blacks-whites and Hispanics-whites had converged by 2000, as *RNI/Seg* declined from 1980-2000 for blacks and whites while increasing for Hispanics and whites. The *RNI/Rseg* index declined for blacks and whites because black-white *RNI* fell at a faster rate than black-white segregation did, and the index rose for Hispanics and whites because Hispanic-white *RNI* increased at a faster rate than Hispanic-white segregation did (see final column of Table 1). The net result is that in 2000 the

[4] The one exception to this trend is a three percent decline in Hispanic-white RNI coinciding with a slight increase (0.9 percent) in Hispanic-white segregation during the 1980s.

level of black-white and Hispanic-white inequality in neighborhood poverty rates both stood at about 70 percent of their potential as determined by their respective levels of group segregation.

The comparison of the Hispanic-black and Hispanic-white combinations is also interesting. Hispanics were much more segregated from blacks (*Rseg* = .742) than they were from whites (*Rseg* = .584) in 1980, but the trends moved in opposite directions over the next two decades (increasing for Hispanic-white segregation, declining for Hispanic-black segregation). *RNI* is a different story. The poverty environments for Hispanics and blacks are relatively similar, and became increasingly so between 1980 and 2000. The poverty environments for Hispanics and whites, by contrast, diverged from 1980 to 2000. While the Gini-based levels of Hispanic-white and Hispanic-black segregation had essentially converged by 2000 (*Rseg* = .618 versus .650), Hispanic-white neighborhood inequality was more than three times greater than Hispanic-black neighborhood inequality (*RNI* = .433 versus .130).

Finally, note the wide variation in Hispanic-black *RNI* across metros. In 1990 and 2000, for example, the Hispanic-black *RNI* standard deviations are larger than the means. This suggests that the Gini coefficients for *RNI* could take on negative values. Obviously a negative Gini does not mean that inequality is "negative" since that is a vacuous concept. Instead, a negative Gini reflects the fact that the Lorenz curve is above the line of equality, indicating (here) that blacks are residentially advantaged relative to Hispanics. This is best illustrated by thinking about the Gini*RNI* Lorenz curves. If we choose blacks for the x-axis and Hispanics for the y-axis one would see a curve below the equality diagonal when Hispanics are more likely to reside in low-poverty environments than blacks. On average, this is the case given that the Hispanic-black *RNI*s are positive for each of the decades. However, metros in which blacks have

residential advantages relative to Hispanics will result in a "flipped" curve that arches over the equality diagonal and results in a negative Gini coefficient.

[FIGURE 3 ABOUT HERE]

We illustrate this in Figure 3, which shows Hispanic-black *RNI* curves for Baltimore and El Paso in 2000. In Baltimore, 50 percent of black residents are located in higher poverty neighborhoods (left side of the x-axis) than are 80 percent of Hispanic residents. By contrast, 50 percent of Hispanic residents in El Paso are located in higher poverty neighborhoods than over 80 percent of the black residents. Note that the relative positions of the El Paso and Baltimore curves would switch if we alternated the axes for cumulative Hispanic and black percentages. The resulting Gini coefficients indicate similar levels of *RNI* but the signs on those coefficients indicate that the residentially advantaged and disadvantaged group alternates from metro to metro. This finding warrants further inquiry and puts the relatively low Hispanic-black Gini*RNI*s and *RNI/Rseg* ratios into some context.[5]

Results for the Neighborhood-Household Inequality Index

Table 2 presents the average Gini coefficients for racial neighborhood inequality and racial household inequality for the three group combinations in the Metro-100 from 1980 to 2000. We focus on what is new in Table 2, that is, on *RHI* and the neighborhood-household inequality index, since we have already examined the results for *RNI* itself. The first finding of note is that, as expected, racial and ethnic inequality (relative to whites) is much smaller at the household level than at the neighborhood level; the Ginis range from slightly over 0.20 for black-

[5] We find no negative RNI values for the black-white or Hispanic-white combinations in 1980 or 2000. In 1990, however, we find that whites are slightly residentially disadvantaged to blacks (RNI = -.030) in McAllen-Edinburg-Mission, TX. Similarly, we find negative 1990 Hispanic-white RNIs in Columbia, SC (RNI = -.035), Knoxville, TN (RNI = -.031), Louisville, KY-IN (RNI = -.013), and Little Rock-North Little Rock, AR (RNI = -.002).

white *RHI* to less than 0.10 for Hispanic-white *RHI* in 1980. From the magnitude of the neighborhood-household inequality index it is clear that factors other than income play a large role in placing minorities in poorer neighborhood environments than the environments experienced by whites.

[TABLE 2 ABOUT HERE]

Our second major finding is that the neighborhood-household inequality index declined over this period, indicating that, *independent of income*, race has become less important in determining one's neighborhood income environment. In the case of whites and blacks, the decline was relatively modest, and due entirely to declines in *RNI*. In the case of whites and Hispanics, the decline was due to a rise in *RHI* (from Gini = .084 to .154, an increase of 80 percent) that outpaced the rise in *RNI*. For whites and Hispanics, then, income environments are diverging more rapidly at the household level than at the neighborhood level. We see a rather dramatic example of this trend occurring between black and Hispanic metropolitan residents. Declining black-Hispanic RNI corresponded with a rapid increase in RHI in the 1990s. These divergent trends were so steep that by 2000 there was a lower average level of black-Hispanic *RNI* than one would have predicted based on the degree of household inequality between the two groups (note that the 2000 neighborhood-household inequality index takes on a negative value).

[FIGURES 4 AND 5 ABOUT HERE]

To depict these results another way recall that racial inequality is linked to the degree of overlap in the distributions of two groups – the less overlap, the greater the inequality, with Gini = 1 when the two distributions do not overlap at all. To appreciate the difference between *RNI* and *RHI*, then, it is also useful to examine the overlap in the two sets of distributions. Figures 4 and 5 depict the distributions of white, Hispanic, and black households across household income

environments and neighborhood income environments, respectively. Note that the distributions are generally more spread out at the household level (Figure 4) than the neighborhood level (Figure 5). Even taking into account the relatively large racial gap at the lowest household income level (< $10,000), there is clearly less dispersion and overlap in the two distributions at the neighborhood level. Neighborhoods, not households, are where we see the most acute racial income inequality.

Summary

This study uses the Gini index to compare racial inequality at the neighborhood level to racial segregation and racial household inequality in the 100 largest U.S. metropolitan areas in 1980, 1990, and 2000. Because racial segregation sets the ceiling for racial neighborhood inequality in a region, the ratio of *RNI* to *Rseg* in a region is an indicator of the degree of racial neighborhood inequality relative to its potential for that region. We find that the ratio varies across metros, and is highest for blacks and whites and lowest for blacks and Hispanics. The ratio is declining for the two group pairs involving blacks – blacks vs. whites and blacks vs. Hispanics – while increasing for whites and Hispanics.

We also compare racial inequality at the neighborhood level to racial inequality at the household level. As expected, we find much greater inequality at the neighborhood level. Moreover, the ratio is declining for both blacks vs. whites and Hispanics vs. whites, albeit for different reasons. In the case of blacks vs. whites, neighborhood inequality is declining while household inequality has remained relatively stable. In the case of Hispanics vs. whites, both types of inequality are increasing, but the rate of increase is greater at the household level, resulting in a declining RNI/RHI ratio.

References

Alba, Richard, Nancy Denton, Donald Hernandez, Ilir Disha, Brian McKenzie, and Jeffrey Napierala. 2008. "Nowhere Near the Same: The Neighborhoods of Latino Children." Paper presented at the annual meeting of the Pennsylvania State University Conference on Family Issues, October, State College, PA.

Allison, Paul. 1978. "Measures of Inequality." *American Sociological Review* 43:865-880.

Charles, Camille Zubrinsky. 2003. "The Dynamics of Racial Residential Segregation." *Annual Review of Sociology* 29:167-207.

Du Bois, W.E.B. 1899. *The Philadelphia Negro: A Social Study*. Philadelphia, PA: University of Pennsylvania.

Duncan, Otis D. and Beverly Duncan. 1955. "A Methodological Analysis of Segregation Measures." *American Sociological Review* 20:210-217.

Firebaugh, Glenn. 2003. *The New Geography of Income Inequality*. Cambridge, Massachusetts: Harvard University Press.

_____. 2008. *Seven Rules for Social Research*. Princeton, NJ: Princeton University Press.

Firebaugh, Glenn and Matthew B. Schroeder. 2009. "Does Your Neighbor's Income Affect Your Happiness?" *American Journal of Sociology* 115:805-831.

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

Frey, William H., Jill H. Wilson, Alan Berube, and Audrey Singer. 2004. *Tracking Metropolitan America into the 21st Century: A Field Guide to the New Metropolitan and Micropolitan Definitions*. The Brookings Institution. *The Living Cities Census Series*. Retrieved May 28, 2008 (http://www.brookings.edu/reports/2004/11demographics_frey.aspx).

Harding, David J. 2003. "Counterfactual Models of Neighborhood Effects: The Effect of Neighborhood Poverty on Dropping out and Teenage Pregnancy." *The American Journal of Sociology* 109:676-719.

Gastwirth, Joseph L. 1972. "The Estimation of the Lorenz Curve and the Gini Index." *The Review of Economics and Statistics* 54(3):306-316.

Hutchens, Robert. 2004. "One Measure of Segregation." *International Economic Review* 45:555-578.

James, David R. and Karl E. Taeuber. 1985. "Measures of Segregation." Pp. 1-32 in *Sociological Methodology*, edited by N. Tuma. San Francisco, CA: Jossey-Bass.

Logan, John R., Brian J. Stults, and Reynolds Farley. 2004. "Segregation of Minorities in the Metropolis: Two Decades of Change." *Demography* 41:1-22.

Lorenz, M.O. 1905. "Methods of measuring the concentration of wealth." *Publications of the American Statistical Association* 9 (70): 209–219.

Ludwig, Jens, Greg J. Duncan, and Paul Hirschfield. 2001. "Urban Poverty and Juvenile Crime: Evidence from a Randomized Housing-Mobility Experiment." *The Quarterly Journal of Economics* 116:655-679.

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

_____. 1993. *American Apartheid: Segregation and the Making of the Underclass*. Cambridge, MA: Harvard University Press.

Myrdal, Gunnar. 1944. *An American Dilemma*. New York: Harper & Bros.

Rankin, Bruch H. and James M. Quane. 2000. "Neighborhood Poverty and the Social Isolation of Inner-City African American Families." *Social Forces* 79:139-170.

Reardon, Sean F. and Glenn Firebaugh. 2002. "Measures of Multi-Group Segregation." *Sociological Methodology* 32:33-67.

Ross, Stephen L. and Margery Austin Turner. 2005. "Housing Discrimination in Metropolitan America: Explaining Changes between 1989 and 2000." *Social Problems* 52:152–180.

Sharkey, Patrick. 2009. "Neighborhoods and the Black-White Mobility Gap." Economic Mobility Project, The Pew Charitable Trusts, Washington DC. Retrieved July 30, 2009 (http://www.economicmobility.org/).

World Bank. 2011. "Gini Index." Retrieved February 27, 2011 (http://data.worldbank.org/indicator/SI.POV.GINI).

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

Table 1. Racial Neighborhood Inequality versus Racial Neighborhood Segregation: Means and Standard Deviations of Ginis for the Metro-100, 1980-2000 [1]

	1980	1990	2000	% change 1980-90	% change 1990-00	% change 1980-00
Black-white						
RNI	.626	.562	.547	-10.2	-2.7	-12.6
	(.155)	(.173)	(.159)			
Rseg	.835	.793	.775	-5.0	-2.3	-7.2
	(.093)	(.104)	(.101)			
RNI/*Rseg*	.750	.709	.706	-5.5	-0.4	-5.9
Hispanic-white						
RNI	.371	.360	.433	-3.0	20.3	16.7
	(.182)	(.214)	(.165)			
Rseg	.584	.589	.618	0.9	4.9	5.8
	(.120)	(.117)	(.103)			
RNI/*Rseg*	.635	.611	.701	-3.8	14.7	10.4
Hispanic-Black						
RNI	.281	.214	.130	-23.8	-39.3	-53.7
	(.263)	(.281)	(.229)			
Rseg	.742	.705	.650	-5.0	-7.8	-12.4
	(.112)	(.130)	(.133)			
RNI/*Rseg*	.379	.304	.200	-19.8	-34.2	-47.2

1. *RNI* is based on neighborhood poverty rates.

Table 2. Racial Neighborhood Inequality versus Racial Household Inequality: Means and Standard Deviations of Ginis for the Metro-100, 1980-2000.[1]

	1980	1990	2000	% change 1980-90	% change 1990-00	% change 1980-00
Black-white						
RNI	.626	.562	.547	-10.2	-2.7	-12.6
	(.155)	(.173)	(.159)			
RHI	.207	.220	.208	6.3	-5.5	0.5
	(.141)	(.145)	(.136)			
(RNI/RHI)-1	2.024	1.555	1.630	-23.2	4.8	-19.5
Hispanic-white						
RNI	.371	.360	.433	-3.0	20.3	16.7
	(.182)	(.214)	(.165)			
RHI	.084	.118	.154	40.5	30.5	83.3
	(.076)	(.102)	(.095)			
(RNI/RHI)-1	3.417	2.051	1.812	-40.0	-11.7	-47.0
Hispanic-Black						
RNI	.281	.214	.130	-23.8	-39.3	-53.7
	(.263)	(.281)	(.229)			
RHI	.067	.069	.136	3.0	97.1	103.0
	(.072)	(.067)	(.123)			
(RNI/RHI)-1	3.194	2.101	-.044	-34.2	-102.1	-101.4

1. *RHI* is based on household poverty rates by race/ethnicity.

Figure 1. White-Black Poverty RNI and Segregation in Atlanta, 2000

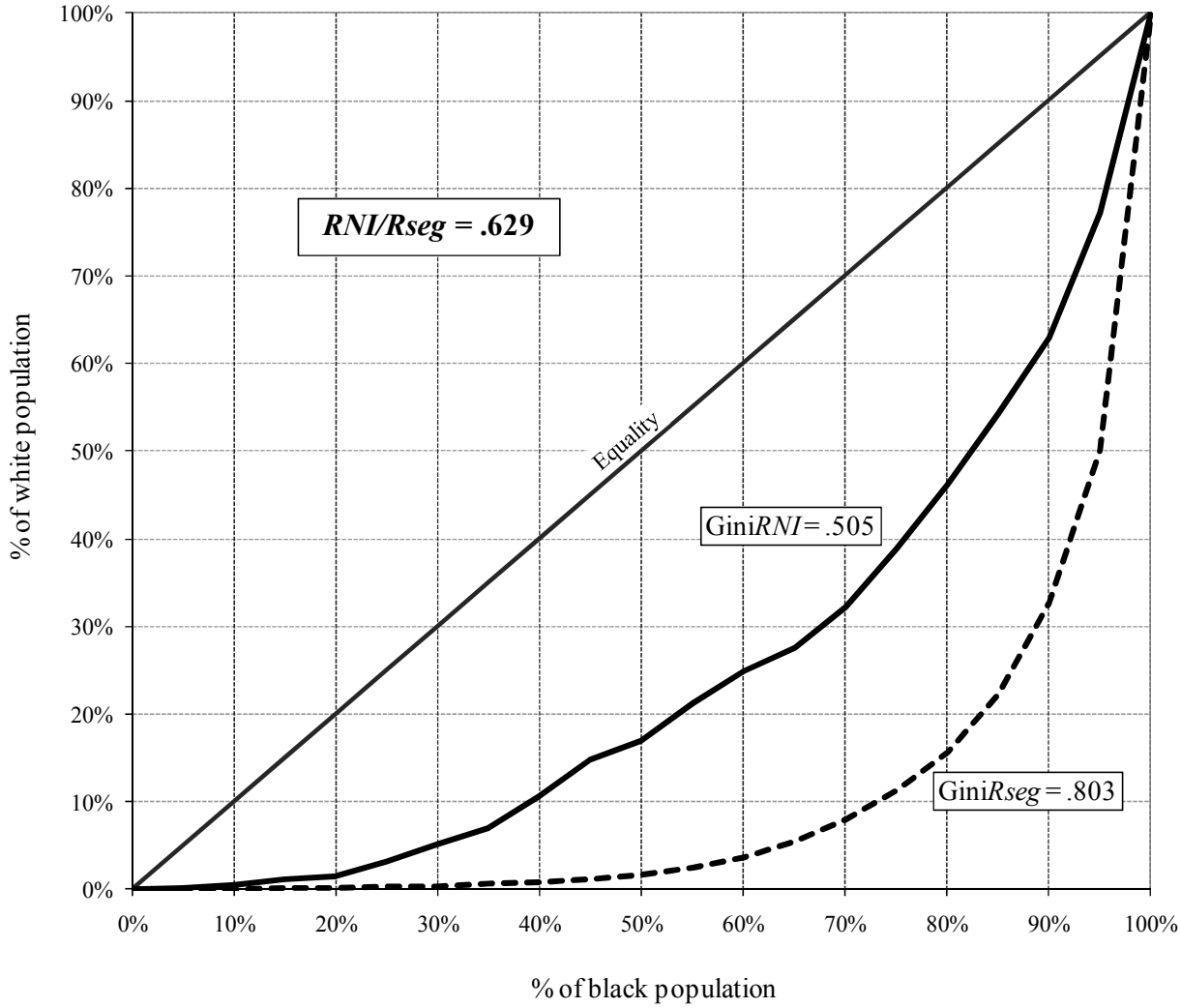

Figure 2. White-Black Poverty RNI and Segregation in Milwaukee, 2000

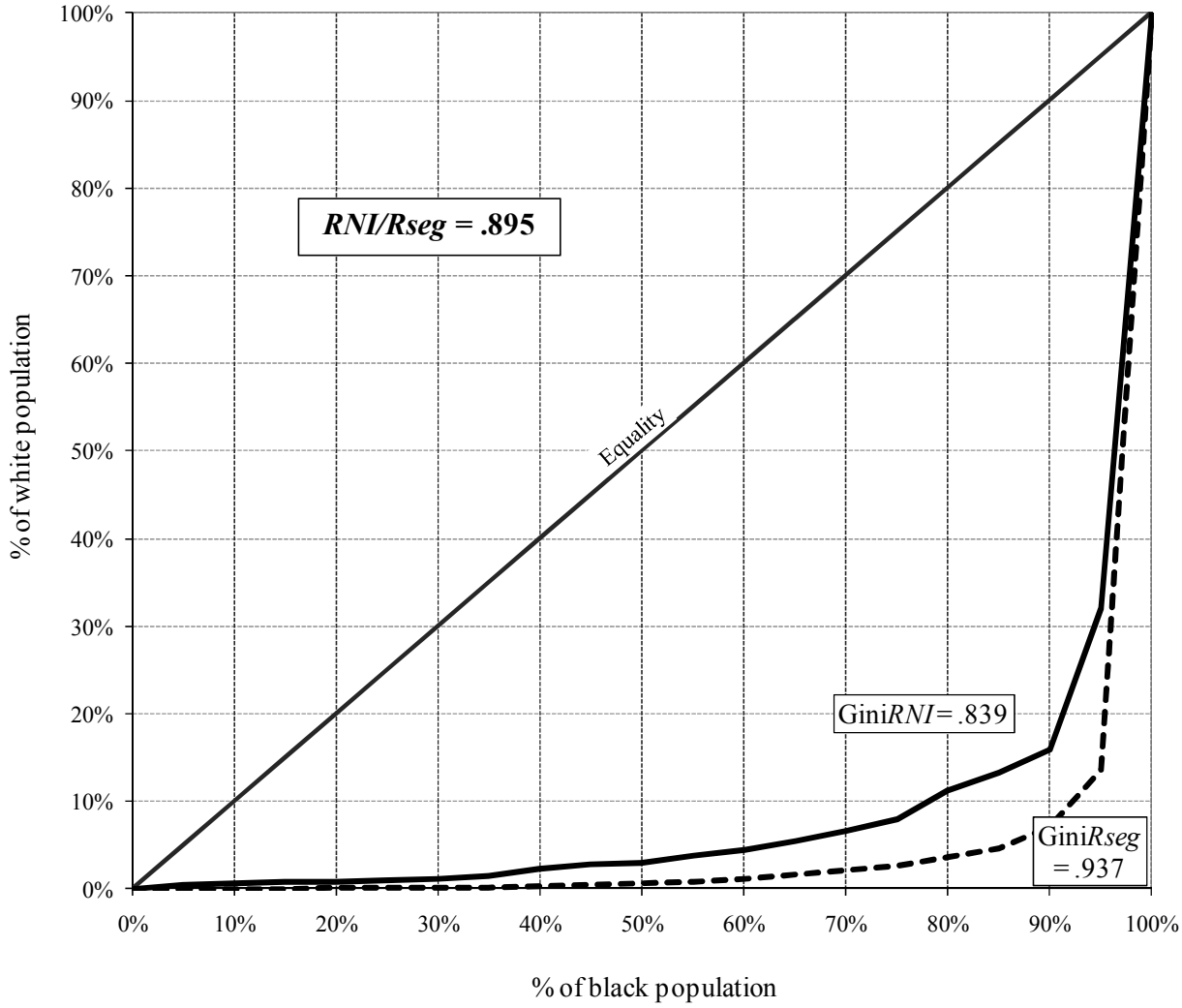

Figure 3. Hispanic-Black Poverty RNI in El Paso and Baltimore, 2000

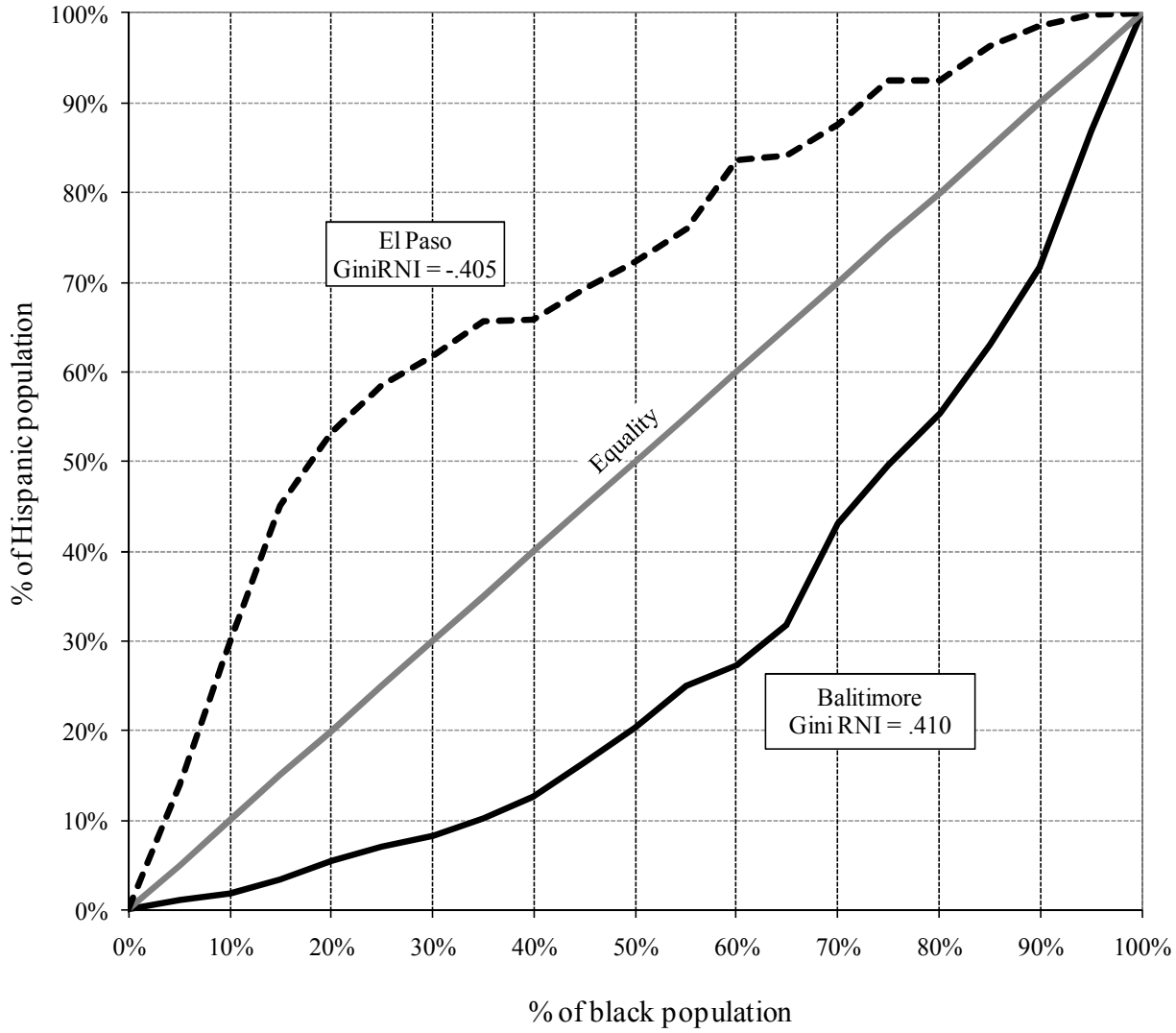

Figure 4. Distribution of Black, Hispanic, and White Households across Metro-100 Household Income Environments, 2000

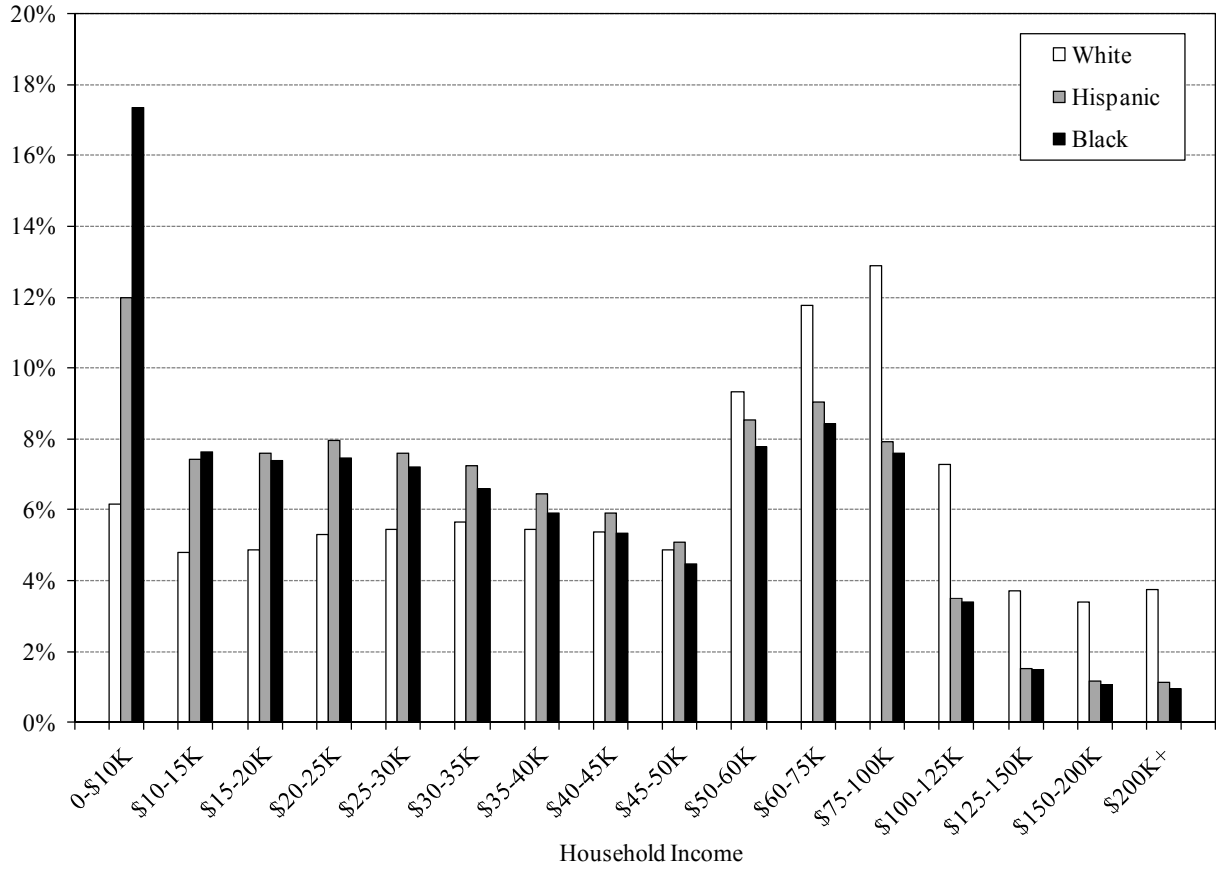

Figure 5. Distribution of Black, Hispanic, and White Households across Metro-100 Neighborhood Income Environments, 2000