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Black–White and Hispanic–White Segregation in U.S. Counties

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Residential segregation in metropolitan areas has been the subject of much research, but this article analyzes patterns of white–black and white–Hispanic segregation in counties across the United States. Our purpose was to understand county variations in this one dimension of inequality. Conceiving of segregation as relative inequality of access to neighborhood resources, we measured segregation in 2000 by the index of dissimilarity (D) calculated by blocks, mapped the index values, and correlated them with census variables. Three filters enabled us to eliminate counties with characteristics that could have corrupted the analyses, leaving us with more than 1,000 counties in each analysis. Both minority groups were less segregated from whites in the West and South and in metropolitan counties. Lower segregation was strongly associated with higher minority socioeconomic status and higher percentages of minorities living in housing built in the 1990s, and Hispanic–white segregation was lower where more Hispanics were U.S.-born or English proficient. The racial threat hypothesis was supported only weakly and inconsistently. Mapping made it possible to identify regional and local patterns of high and low segregation as well as the lower segregation of suburban counties in some large metropolitan areas. **Key Words:** blacks, counties, Hispanics, segregation, whites.

在大都市地区的住宅区的隔离已成为许多研究的主题，但是，这篇文章分析美国各个县的白人—黑人以及白人—西班牙人之间的隔离形态。我们的目的是了解隔离形态各县间的变化在这种一维空间的不平等。把隔离构想为访问邻里资源的相对不平等，我们使用基于人口块计算的相异指数（ D ）测量了 2000 年的隔离情况，绘制了指数值图，并把它们与人口普查变量相关联。使用三个过滤除去了那些具有扰乱分析结果之特点的县，在每个分析中留下了 1000 多个县。这两个少数群体在西部和南部以及在大城市县与白人的隔离程度较低。较低的隔离与较高的少数民族的社会经济地位和较高的生活在 20 世纪 90 年代建造的住房里的少数民族百分比强烈相关，并且西班牙裔—白人的隔离在有较多的美国出生或精通英语的拉美裔的地方更低。结果仅仅很弱地，不一致地支持种族威胁的假设。地理制图使我们可能识别高与低的隔离的区域和地方的形态，以及在一些大都市地区的郊区县的低隔离模式。关键词：黑人，县，西班牙裔，隔离，白人。

La segregación residencial en áreas metropolitanas ha sido tema de mucha investigación, pero en este artículo nos concentramos en el análisis de los patrones de segregación blanco-negro y blanco-hispano que ocurren a nivel de condado a través de los Estados Unidos. El propósito de nuestro estudio era entender las variaciones por condado en esta particular dimensión de la desigualdad. Viendo la segregación como la desigualdad relativa de acceso a los recursos del vecindario, medimos la segregación en el 2000 por medio del índice de disimilitud (D) calculado por manzanas, cartografiamos los valores del índice y los correlacionamos con variables censales. Mediante la aplicación de tres filtros nos fue posible eliminar los condados dotados de características que habrían podido viciar los análisis, lo cual nos dejó con más de 1.000 condados para cada análisis. Ambos grupos minoritarios aparecieron menos segregados por los blancos en el Oeste, el Sur y los condados metropolitanos. La baja segregación estuvo fuertemente asociada con un mejor estatus socioeconómico de la minoría y con porcentajes más altos de minorías que residen en viviendas construidas en los años 1990; y la segregación hispano-blanco era menor donde había más hispanos nacidos en EE.UU., o que eran proficientes en inglés. La hipótesis de la amenaza racial solo apareció débil e inconsistentemente respaldada. El mapeo permitió identificar patrones regionales y locales de alta y baja segregación, lo mismo que la más baja segregación en los condados suburbanos de algunas de las áreas metropolitanas grandes. **Palabras clave:** negros, condados, hispanos, segregación, blancos

The segregation or separation of racial and ethnic groups by neighborhoods of residence has a long history in the United States, and over the last half-century this has been the subject of much research in sociology, urban studies, and geography. The level of segregation in any place indicates the degree to which different groups have access to the same neighborhoods and neighborhood resources, an important dimension of the larger problem of social inequality. In the United States, most research has focused on two questions: (1) how best to measure segregation and (2) how and why the degree or level of segregation of major racial and ethnic groups from whites has or has not changed from one decade to the next. In general, researchers studying segregation have been especially interested in measuring and explaining changes for the nation as a whole.

Our research is distinctly geographical in that it investigates directly the degree to which segregation varies from place to place across the United States and how these place differences can be explained. In its focus on places it is similar to Brown and Sharma's (2010) recent study of diversity in metropolitan areas, but in contrast to Brown and Sharma, we measured segregation in counties rather than in metropolitan areas. This required special methodological adjustments, but it enabled us to include both metropolitan and nonmetropolitan areas across the country. We are aware of only one other researcher who has investigated segregation by county across the United States, but that research analyzed level of segregation only as a possible explanation of the pattern of voting for Barack Obama in the 2008 presidential election (Enos 2010, 2011).

We use Census 2000 data to study the segregation of whites from the country's two largest and most important other groups, blacks and Hispanics, which we refer to as minorities regardless of their numbers relative to whites in any one place. For consistency, both blacks and Hispanics are generally considered here as ethnic groups although both are treated as race groups in terms of the racial threat hypothesis. Segregation levels were compared in metropolitan and nonmetropolitan counties within each of the four basic census regions. Our primary analysis involved correlating levels of segregation with potentially relevant variables, and because of the distinctive history

of race relations in the South we analyzed black-white segregation in the South separately from the other regions. Mapping identified smaller regional and localized patterns of segregation, including differences between central counties and suburbs within many metropolitan areas.

Theoretical Bases for Understanding Segregation

After discussing the general causes and consequences of segregated neighborhoods, we present the two most common conceptions of segregation that underlie its meaning and decisions about how it should be measured.

Causes of Segregation

There are four primary explanations for the creation and maintenance of segregation. First, segregation can result from prejudice and various discriminatory mechanisms by the dominant white society that restrict the locations of minority residences, presumably because whites perceive the minority as threatening (Blalock 1967). Such prejudice and discrimination have best explained black-white segregation and perhaps also the segregation of many other minorities (Kaplan and Woodhouse 2004; Peach 2005; Fischer and Tienda 2006). Because greater proportions of minorities would seem to be viewed by the dominant white group as more threatening than lower proportions (Blalock 1967), place variations in levels of segregation can be understood theoretically as a function of their varying minority proportions. In what is sometimes called the *racial threat hypothesis*, the greater perceived threat to whites in a place with a higher minority percentage might prompt stronger white efforts at social control, including segregating that minority more completely than in a place with a lower minority percentage (e.g., Fossett and Kiecolt 1989; DeFina and Hannon 2009).

Second, group differences in income and wealth mean that on average poorer groups lack the financial resources that would give them access to neighborhoods with more expensive housing, resulting in some level of segregation (Kaplan and Woodhouse 2004; Iceland and Wilkes 2006). Such a disadvantage can itself be

partly due to a group's lower average educational attainment or characteristics related to potential employment, but it can also be due to prejudice and discrimination on the part of the dominant group.

The third cause of segregation is minority group preference for living among one's own group. Although such partly segregated residential concentrations can provide some protection from potential hostility on the part of outsiders, they probably reflect a mostly voluntary choice by some members of the group. This is because ethnic neighborhoods provide a culturally familiar setting and array of activities for immigrants and minorities (Allen and Turner 2005; Peach 2005). Fourth, all ethnic groups have attitudes regarding which other groups are preferred or tolerated nearby and in what proportions; these affect everyone's decisions about living in various neighborhoods (Charles 2000).

It is difficult to distinguish the relative importance of these four as influences behind segregation today, and the more complex causal factors behind segregation have become the subject of much discussion and controversy (e.g., Kaplan and Woodhouse 2004; Chung and Brown 2007). Because both blacks and Hispanics have been the subject of prejudice and discrimination historically and still average a lower socioeconomic status than whites, we see the first two causes as more likely general explanations of the levels of segregation we uncover, although the last two factors also play roles.

When a group experiences significantly lower levels of segregation over time, the theoretical explanation has usually involved the model of spatial assimilation. Assuming that an immigrant group settles in a concentration in a relatively poor area when it first arrives, spatial assimilation refers to the later dispersal of that group into suburbs that is thought to accompany economic progress and acculturation to the mainstream or core culture (Massey 1985; Iceland and Nelson 2008). This model was developed in the context of pre-1920s European immigration, but aspects of it might apply to some groups immigrating since the 1960s such as Hispanics. Thus, low levels of Hispanic-white segregation in some places at any one time might well have resulted from the spatial dispersal of Hispanics and reduced

cultural and economic differences between local Hispanics and whites. Although on average black-white segregation has remained higher than that for all other groups despite acculturation and some economic progress (Logan, Stults, and Farley 2004), those places with low levels of black-white segregation are probably ones into which blacks of relatively middle-class or high status have dispersed.

Segregation of an ethnic group can increase if it grows rapidly in numbers without proportionate dispersal out of residential concentrations (Allen and Turner 2002; Logan, Stults, and Farley 2004). This is more likely to occur if large numbers of immigrants settle in the same neighborhoods as their relatives and friends.

Some Consequences of Segregation

There is also much evidence regarding the effects of segregation (Massey and Denton 1993; Jargowsky 1997; van Kempen and Özüekren 1998). Especially in the United States, with its legacy of forcibly segregated black, Mexican, and other minority populations and its strong assimilationist ideology, there has been a clear sense over the last half-century that residential segregation, whatever the cause, is wrong. Although many working-class and middle-class blacks and Hispanics have been able to move out of poor central-city concentrations of their group, the neighborhoods that remain typically reflect the worst effects of segregation—high crime, gangs, poor schools and high dropout rates, abandoned and deteriorating housing, and few good jobs or amenities, most of which are in distant suburbs. Moreover, the violence and disorder of segregated neighborhoods lead to much family stress, which takes its toll on students' academic performance (Charles, Dinwiddie, and Massey 2004). A range of health problems are also associated with living in segregated neighborhoods, in some cases even after controlling for poverty (Grady and McLafferty 2007). When individual and community characteristics are controlled, less segregated metropolitan areas have substantially higher rates of black entrepreneurship (Fairchild 2008).

With increased immigration in recent decades, however, the view that the consequences of segregation are necessarily negative has been questioned. Some immigrants, as

well as some nonimmigrant minorities, prefer to live within a neighborhood where their group is fairly well represented. Some degree of ethnic concentration offers greater cultural comfort and support compared to a neighborhood where U.S.-born whites are strongly predominant. Immigrants in particular have easier access to shops, houses of worship, private schools, health professionals and others serving their ethnic group and jobs that do not require knowledge of the dominant language of the country (Li 1998). Living in a concentration with large numbers of an ethnic group might open up good entrepreneurial opportunities for members of the group, whose businesses often employ fellow ethnics (Portes and Jensen 1989). On the other hand, there is evidence of some employment disadvantage of living in a large concentration of one's group, presumably due to the greater numbers of competing workers in such places (Galster, Metzger, and Waite 1999; Parks 2004).

Another consequence of living in a locality where ethnic groups are somewhat segregated is that their separate neighborhoods serve to accentuate group differences. Naming such neighborhoods further acts to emphasize group distinctions. Residents of some neighborhoods could be subtly harmed, for instance, in applying for a job, because their neighborhood name brings up images of crime or poverty in the minds of people who do not live there. On the other hand, some immigrants enjoy having a residential and business concentration of their group because it symbolizes the group in a positive way and acts as a community marker for political purposes (Hum and Zonta 2000). In contrast, in localities where segregation is low, such distinct ethnic neighborhoods are lacking or not clearly evident. In such places ethnic differences are not reinforced by visible or perceptual neighborhood differences.

With numerous examples of immigrant-based concentrations in the United States, Canada, and Western Europe, it now appears that segregation is not automatically good or bad but can have either—or both—beneficial or detrimental effects on residents with the net advantages or disadvantages dependent on the group, its preferences, and its social and economic circumstances (Kaplan and Woodhouse 2005; Musterd 2005).

Conceptualizing Segregation

Residential segregation appears to have several underlying conceptions or dimensions, each measurable by different statistics (Massey and Denton 1988). We discuss here the two conceptions that are the most important and most widely held by researchers: evenness in group percentage distributions across neighborhoods and exposure, the probability of interaction between groups in their neighborhoods of residence.

Relative evenness refers to the degree to which neighborhoods have similar proportions of the two groups compared to the average proportion of the metropolitan area, county, or other area. A high degree of unevenness indicates a high degree of segregation. If there is much unevenness with the two groups generally occupying different neighborhoods, the better neighborhood-based resources and amenities are assumed to be more accessible to one group than the other.

All of this is important because neighborhoods often differ greatly in their access to employment, good schools, transportation, police protection, recreation, shopping, and other services and amenities. For homeowners, some neighborhoods make better investments than others because those homes hold or increase their values better than homes elsewhere. Conversely, some neighborhoods are in or near hazardous environments and other disamenities. Because ethnic group differences in residential location can affect the relative safety, health, socioeconomic position, and wealth of the groups, the neighborhoods that people live in are clearly important in their lives.

A second conceptualization of segregation involves exposure to the other group or the potential social mixing of groups based on their residential distributions. It is the probability of a member of one group randomly meeting someone from the other group as opposed to someone from one's own group and is usually measured by the exposure index.

Although technically the exposure index indicates only this probability of meeting, we suspect that many researchers extrapolate the concept to suggest that the index measures the probability of meaningful interaction between

groups. This seems to make sense because there seems little or no social value in simply passing someone from another group on the street. Moreover, it seems reasonable to think that residence in the same neighborhood should enhance meaningful social interaction between groups, as suggested by Peach (2005), and that this will improve intergroup attitudes.

There is a large body of research concerning the attitudinal and behavioral effects of greater contact between members of different groups, however, and the results are mixed (e.g., Allport [1954] 1979; Forbes 1997; Dovidio, Eller, and Hewstone 2011). Increased contact does not necessarily lead to a more positive assessment of one group by the other. There is also evidence that greater ethnic heterogeneity in a local area is associated, at least initially, with less trust and cooperation both between groups and within each group (Putnam 2007). Moreover, ethnographic research has shown that the level of residential segregation of a group does not necessarily correlate at all with its level of segregation in work and social activities (Schnell and Benjamini 2001).

Thus, our research does not assume any greater social interaction or better attitudes between groups in less segregated neighborhoods. It is based instead on the conception of segregation as unevenness, which fits our goal of measuring inequality in neighborhood of residence between groups.

Findings from Previous Research

For several decades, scholars have used census data to measure the degree to which minority groups and whites live in the same neighborhoods as an indicator of minority social and economic integration with whites. Each new decennial census has been examined closely for signs of possible change in the relative distributions of groups in metropolitan areas (e.g., Ellen 2000; Iceland, Weinberg, and Steinmetz 2002; Logan, Stults, and Farley 2004). Segregation has been consistently greater for blacks and whites than for Hispanics and whites or Asians and whites, although in the 1990s there was some reduction in black-white segregation, especially in areas with small black populations.

There has been much research on segregation in larger metropolitan areas of Canada

(e.g., Bauder and Sharpe 2002; Walks and Bourne 2006) and Europe, where levels of segregation have often been compared to those in the United States (e.g., Petsimeris 1998; van Kempen and Özüekren 1998; Musterd 2005). Studies in European countries have pointed out country differences in ethnic composition and other characteristics of immigrants, government-supported housing and other institutions, availability of public transportation, and ideologies with respect to immigrant assimilation. Although multicountry generalizations are difficult, one study of segregation in the United States, Canada, Great Britain, Australia, and New Zealand found that in general segregation was greater in metropolitan areas with larger total populations, smaller percentages of whites, and less ethnic diversity (Johnston, Poulsen, and Forrest 2007).

Additional studies of U.S. metropolitan areas have generally confirmed these findings. One advantage of focusing only on the United States is that institutional differences between countries are essentially eliminated, presumably simplifying the explanations of place differences in segregation. Segregation of both blacks and Hispanics from non-Hispanic whites is greater in larger places than smaller ones (Iceland, Weinberg, and Steinmetz 2002; Logan, Stults, and Farley 2004). The expectation based on the racial threat hypothesis that segregation will be greater where minority proportions are higher was found in one study to be true for black-white segregation but not Hispanic-white segregation (Logan, Stults, and Farley 2004). In two other studies, however, Hispanic-white segregation was significantly and positively related to Hispanic proportions (Lichter et al. 2007; DeFina and Hannon 2009).

Although assessing the influence of segregation's causes is difficult, the role of relative socioeconomic status as a factor in segregation is suggested by the finding that Hispanics and Asians with higher economic status are less separated from whites than lower status members of those groups (Iceland and Wilkes 2006). Black-white segregation is also lower for higher status blacks, but the class differences in segregation are much smaller than for Hispanics and Asians.

Spatial and cultural assimilation is illustrated by the finding that segregation between immigrant Hispanics and U.S.-born whites is lower

in metropolitan areas where higher percentages of immigrants have lived longer in the United States and speak English well or very well (Iceland and Scopilliti 2008).

Some scholars have thought that metropolitan areas with higher percentages of either residents or minorities located in suburbs would be less segregated, but previous research has not found strong or consistent results (Logan, Stults, and Farley 2004; Iceland and Nelson 2008). When the level of segregation in central cities or counties is directly compared with that in suburbs, however, the results can show the expected lower segregation in the suburbs. For example, as of 1990 blacks and whites were less segregated in general and at comparable income levels in Southern California's suburban counties than in the central county, which is Los Angeles (Clark and Ware 1997). This pattern is not necessarily true everywhere, though, and might be dependent on the areal units defining suburbs, as shown by the fact that within Wayne County, Michigan, blacks and whites of the same income levels were less segregated in Detroit than in areas outside that city (Darden and Kamel 2000).

Although in recent decades the metropolitan area has been the unit for which nearly all segregation in the United States has been measured, there are exceptions. Some studies measured segregation in places, including cities, small towns, villages, and census-defined places, in metropolitan and nonmetropolitan areas, both in Texas (Murdock, Hwang, and Hoque 1994) and nationally (Lichter et al. 2007). Findings from research on urban places have generally been consistent with those based on metropolitan areas.

Our Research Methods

Various measures for different concepts of segregation have been evaluated by scholars studying segregation, and several have been widely used (Massey and Denton 1988). Recently, there has been much discussion of possible improvements in ways to measure segregation (e.g., Dawkins 2004; Ellis, Wright, and Parks 2004; Kaplan and Woodhouse 2005; Schnell and Benjamini 2005; Wong 2005; Johnston, Poulsen, and Forrest 2007, 2009; Lee et al. 2008; Brown and Sharma 2010). Although

many new approaches and methods are valuable, complexity of calculation or difficulty in interpretation has meant that most have been applied to only one place. Moreover, where results of different methods have been compared, the innovations appeared to have only small effects. For our purpose of studying segregation in a great many places as an indicator of neighborhood inequality, it was appropriate to use the most basic and widely used statistic for measuring unevenness, the index of dissimilarity (D).

The Index of Dissimilarity

This statistic measures the average absolute deviation of an ethnic group's percentage in neighborhoods from its percentage in the larger area as a whole, such as a city, county, or metropolitan area (James and Taeuber 1985; White 1986). It is an appropriate statistic where the goal is to measure segregation between only two groups, and it is not affected by place differences in group population sizes. This is in contrast to the exposure index, which is directly affected by the absolute size of groups in the larger area. Because we needed to compare segregation in places that differed a great deal in Hispanic, black, and white numbers, D was clearly superior.

The following formula illustrates the calculation of black-white segregation; for Hispanic-white segregation, Hispanic numbers should be substituted for black numbers.

$$D = \frac{1}{2} \sum_{i=1}^N \left| \frac{b_i}{B} - \frac{w_i}{W} \right| \times 100$$

where b_i is the black population of the i th neighborhood, B is the total black population of the county, w_i is the white population of the i th neighborhood, and W is the total white population of the county.

Values of D range from 0 to 100, with higher values indicating that groups are more separated into different neighborhoods and low values indicating more group mixing. The actual value indicates the proportion of either group that would need to be redistributed to give all neighborhoods the same group proportions. The index of dissimilarity is an excellent descriptive measure of the relative unevenness of

distributions. However, it cannot distinguish the importance of the different possible causes of unevenness, including random influences, which are greater where percentages of one group are very low or very high or where neighborhood areal units contain small numbers of residents (Cortese, Falk, and Cohen 1976). We used values of D that were previously calculated by researchers at the University of Michigan and made available online (Population Studies Center 2003).

Counties

We agree with Lichter et al. (2007) that metropolitan areas have been overemphasized in segregation research and that nonmetropolitan areas and smaller places need study. Rather than focusing on urban places per se as others have done, however, we believe that the county is the appropriate unit for representing and comparing local areas in a nationwide study. The 3,219 counties (and county equivalents) in the United States provide a good consistent areal unit for describing regional and local variations in segregation, and they permit a distinction between central and suburban counties within metropolitan areas. Counties are also appropriate because they have been the basic building block for the study of labor market areas (Singelmann and Deseran 1993) and at least 75 percent of the workers in most counties live in those same counties (U.S. Bureau of Labor Statistics 2009).

To eliminate potential misleading effects on D scores and maps due to very small populations, we selected only counties with at least 1,000 non-Hispanic whites and 1,000 blacks or Hispanics, depending on the particular minority group whose segregation from whites we were measuring. In addition, we excluded counties in which half or more of blacks or Hispanics were in prison or other correctional institutions because a proportionately large group-quarters population could misleadingly affect measures of segregation, which are clearly designed to measure distributional differences between household populations.

Blocks

The next decision concerned whether to measure group distributions within each county by

means of census tracts, block groups, or blocks. The census tract has been the most commonly used unit by which to measure neighborhood ethnic proportions in metropolitan areas, but tracts would be too large for our study, which included both metropolitan and nonmetropolitan counties. Many tracts contain small ethnic neighborhoods within them, as is shown by the fact that 48 percent of a sample of census tracts in Los Angeles County contained blocks that had significant nonrandom differences in ethnic proportion from their tract averages (Allen and Turner 1995). We initially thought that block groups might be the appropriate unit for our study but later found from mapping those D scores that the very large areal extent of many block groups in nonmetropolitan areas could still hide too many ethnically differentiated neighborhoods. If small and essentially separate minority and white neighborhoods were combined to create average group proportions in large block groups, the result would be a misleadingly low indication of segregation. In and near small towns, areas of even a few square miles can hide separate black and white settlements, as in the Mississippi's Yazoo Delta (Aiken 1987, 1990).

Accordingly, we used a measure of segregation based on blocks. Blocks separate people living on one side of a street segment from those on the other, but the higher measurement of segregation that this produces is probably balanced by the possibility of some segregation within larger blocks. The block is the smallest possible unit for which U.S. census data are available; it was the unit chosen by other researchers studying segregation in small urban places (Murdock, Hwang, and Hoque 1994; Lichter et al. 2007). We believe that blocks are the most relevant unit with which to measure Americans' assessment of their own and potential neighborhoods. The appropriateness of our measuring segregation at the block scale is confirmed by the research design of a major study of people's attitudes about preferred and acceptable neighborhood ethnic composition in which neighborhoods were defined in terms of fifteen houses (Charles 2000).

Nevertheless, our awareness of the potentially misleading effect of large block sizes, especially in less urban areas, suggested the elimination of counties with a large average block size. For this reason we made the arbitrary

decision to exclude counties with average block areas greater than one square mile.¹ This additional filter reduced our counties to 1,319 for studying black–white segregation and 1,092 for Hispanic–white segregation.

The choice of areal unit in an ecological study affects the resulting analyses, a phenomenon called the *modifiable areal unit problem* (MAUP; Openshaw 1984). Our use of counties and blocks rather than metropolitan areas and block groups or tracts meant that our results should be somewhat different from those of previous studies. These differences, however, might illuminate new aspects of segregation and its relationships with explanatory variables.

Correlation Analysis

To explain the local variations in segregation, we correlated *D* with selected variables that had been found to be significant in earlier studies at the metropolitan scale, particularly variables describing minority population characteristics (Frey and Farley 1996; Logan, Stults, and Farley 2004; Lichter et al. 2007; Iceland and Nelson 2008; Iceland and Scopilliti 2008). We considered the racial threat hypothesis to be supported if the correlation between level of segregation and the percentage of the minority group was positive and significant. Variables with distributions that were skewed (SPSS skewness score greater than 2) were transformed to logs. With our interest in the places themselves, all of our counties were treated equally without weighting according to their minority or total population numbers.

Mapping

Mapping our findings had the potential to uncover new patterns. This could presumably help link the generalizations from correlation analysis to specific places, but our interpretations can only be partial, suggestive, and supplementary to the correlation analysis. Where large metropolitan areas are identified by name, the small circle locates the central county with suburban counties on its periphery.

Our maps of black–white segregation and Hispanic–white segregation were designed to focus on counties substantially above or below average in segregation. Because frequency distributions of both sets of *D* values were nor-

mal, we chose choropleth categories to represent whole standard deviations from the means. Colors designate counties either one or two standard deviations above or below the means for their respective form of segregation. Thus, the yellow color represents counties within one standard deviation of the mean of *D* values. Light blue and orange designate counties with *D* values between one and two standard deviations from the mean. Dark blue and red counties are at least two standard deviations from the mean, indicating very low or very high segregation.

Results: Variations by Region and Metropolitan Status

Consistent with previous studies, we found whites more residentially separated from blacks than from Hispanics, as indicated by the county means (Table 1). The range of *D* values for both types of segregation is large, indicating much county variation.

In this study we follow the regional distinctions of Northeast, Midwest, South, and West made by the Census Bureau and widely used by Americans. The average levels of both black–white and Hispanic–white segregation do not differ greatly by region, but segregation is lower in the West and South than in the Northeast and Midwest (Table 2). This is consistent with findings based only on metropolitan areas (Iceland, Weinberg, and Steinmetz 2002). Lichter and his colleagues (2007) did find that blacks and whites were more segregated nationally in nonmetropolitan urban places, but our findings indicate clearly that the higher segregation in the nonmetropolitan counties applies to each region, with the metro–nonmetropolitan distinction greatest in the South. With respect to Hispanics and

Table 1 Distributions of county indexes of dissimilarity (*D*)

Statistic	Black–white segregation	Hispanic–white segregation
Number of counties	1,319	1,092
Minimum	20.8	20.0
Maximum	91.9	86.0
Mean	70.1	60.4
Median	71.3	60.6
Standard deviation	9.1	9.7

Table 2 Mean block segregation (*D*) in counties by region and metropolitan status

Location and type of county	Black–white segregation	<i>N</i>	Hispanic–white segregation	<i>N</i>
West region	65.2	83	52.5	189
Metropolitan	65.0	76	50.3	91
Nonmetropolitan	67.9	7	54.5	98
Midwest region	71.8	188	63.4	252
Metropolitan	71.5	129	61.0	154
Nonmetropolitan	72.4	59	67.2	98
Northeast region	73.8	115	64.9	118
Metropolitan	73.8	102	64.7	106
Nonmetropolitan	73.8	13	67.3	12
South region	69.8	933	60.7	533
Metropolitan	66.4	359	57.6	281
Nonmetropolitan	71.9	574	64.2	252

whites, in the South and the Midwest the greater segregation in nonmetropolitan counties might be related to the relatively recent arrival of so many Hispanics during the 1990s (Smith and Furuseth 2006; Massey 2008).

These nonmetropolitan results are consistent with the notion that localities are more traditional and less open to social change in nonmetropolitan areas than in metropolitan areas, which have generally had greater immigration and diversity of ethnic groups.

We do not include our calculations of the average segregation in central counties of metropolitan areas compared to suburban counties, where a central county was any county that contained a central city. This was because the average difference between segregation levels in the two types of counties was very small or nonexistent.² This is presumably the reason why other researchers' findings based on indirect measurement have not been clear. In some of the larger metropolitan areas, however, differences in segregation in more central as opposed to suburban counties are evident on the maps, and we discuss these at that point.

Results: Black–White Segregation

Correlation Analysis

Because the South has a very large number of counties, a wide distribution of both blacks and whites, and a longer tradition of racial separation, we calculated black–white correlations separately for the South and regions outside the South (Table 3).

Our most important result was the strong association between lower segregation and higher black socioeconomic status—a finding much stronger than that from metropolitan-scale analysis (Iceland and Wilkes 2006). This was true in both the South and other regions. The higher status of blacks was indicated by their greater education and higher incomes as well as less poverty and higher percentages working as managers or professionals. Counties in which the household income of blacks was high compared to that of whites were also less segregated, a confirmation of earlier research at the scale of metropolitan areas (Logan, Stults, and Farley 2004) and urban places (Lichter et al. 2007). Presumably related to all these and also

Table 3 Pearson correlations of black–white segregation (*D*) and selected variables

Variable	South	Other	Variable	South	Other
Log total population	–0.149	–0.037*	Log% black	–0.092	0.134
Log black population	–0.207	0.057*	Log% blacks foreign-born	–0.210	–0.262
% blacks in 1990s housing	–0.369	–0.449	% blacks homeowners	0.073	0.112
% blacks high school grads	–0.380	–0.512	Black median household income	–0.567	–0.270
% blacks 4-year college grads	–0.391	–0.432	Black–white income ratio	–0.373	–0.229
% blacks in poverty	0.538	0.315			
% blacks in government	–0.159	–0.294	Log% blacks in military	–0.248	–0.366
% blacks in agriculture	0.300	0.081*	% blacks veterans	–0.307	–0.259
% blacks manager/professional	–0.350	–0.359			

Note: "Other" includes counties in Northeast, Midwest, and West regions only.

N = 933 counties in South; *N* = 386 counties in Other.

*Not significant at 0.01 level.

indicative of lower segregation was the percentage of blacks living in housing built in the 1990s. This was one of the highest of the correlations outside the South and is consistent with other studies in which the variable was measured without regard to the percentage black in the new housing (Logan, Stults, and Farley 2004; Lichter et al. 2007).

Why is segregation clearly less in counties where black socioeconomic status is higher and where more blacks live in newer housing? We suspect that whites find higher-status blacks less threatening than poor blacks, although we infer from a recent literature review that this notion has not been tested (McDermott 2011). Also, counties with higher proportions of blacks living in recently built homes and neighborhoods may have proportionately less of the racial tension that can be a legacy of older neighborhoods.

Several correlations appear to describe different sets of counties but together they illuminate other general patterns. The lower segregation in counties where higher percentages of blacks are either veterans or currently in the armed forces has been found by others (Lichter et al. 2007; Lee et al. 2008). The association between segregation and percentage of minorities in the military is not surprising, an effect of the racial desegregation of the military over a half-century ago and perhaps local civilian adaptation over the years to this change. Where higher proportions of any county's population live on the military installation itself, lower levels of segregation would be expected. This role of military desegregation might be the main example in the United States of an institutional effect on place differences in segregation, so commonly found in studies of segregation across different European countries.

Counties with higher percentages of blacks who are foreign born (immigrants) tend to be less segregated, a probable reflection of the distribution of those blacks more in metropolitan areas with greater economic opportunities. The greater segregation in the South in counties where blacks work more in agriculture is an original finding not applicable to the other regions.

Lastly, in Southern counties segregation was negatively correlated with total and black population size and percentage; outside the South the only significant correlation was a

positive one with percentage black. These findings differ from those of previous studies where segregation was found to be much less in smaller metropolitan areas (Iceland, Weinberg, and Steinmetz 2002; Logan, Stults, and Farley 2004), smaller nonmetropolitan places (Lichter et al. 2007), and areas and places with smaller percentages of blacks. We expect that the smaller populations of many counties in the nonmetropolitan South, where segregation tends to be relatively high, weakened generalizations found at the metropolitan and urban place scales. Southern counties with higher percentages of blacks tend to be slightly less segregated, a finding that does not support the racial threat hypothesis.

Outside the South, however, the significant but low correlation between percentage black and higher levels of segregation supports the racial threat hypothesis.

Nevertheless, the associations we found between segregation and both population size and black proportions were mixed in direction and weaker than correlations with many other of our variables. This suggests that explanations other than racial threat are more important. Racial threat might be a more powerful explanation of segregation levels if measured as some combination of high minority percentage and low socioeconomic status.

Mapping

The map shows the high level of segregation in counties containing older industrial cities of the Midwest and smaller industrial cities of Pennsylvania (Figure 1). There is exceptionally high segregation in Lake County, Indiana, and in Wayne County, Michigan, where the cities of Gary and Detroit once epitomized the country's steel and auto industries. Such places reflect a pattern established by the mid-twentieth century following the arrival of many blacks in those industrial centers as early as World War I. In 1960, cities in the Midwest and South were somewhat more segregated than those in the Northeast and West (Taeuber and Taeuber 1965).

The very high level of segregation in Osage County, Oklahoma, is an anomaly and results from unusually contrasting settlements within the county. Blacks in the county average a high socioeconomic status, which would suggest a

Figure 1 Black-white residential segregation, 2000. (Color figure available online.)

low level of segregation. In this case, however, nearly all the blacks in the county are in one small section of Tulsa. The remainder of Osage County is mostly rural and white, resulting in a level of segregation that is misleadingly high because of the very different areas included within the county. In contrast, the very high segregation shown in eastern Texas's Hardin County and central Louisiana's Grant Parish appear to be the more typical situation in that they are related to the high levels of poverty and low status of blacks in those counties, where black incomes are approximately half those of whites.

In the South, especially from Florida and Alabama westward, blacks and whites are more segregated than the national average in many counties, most of which are nonmetropolitan. The exceptionally high segregation in DeKalb County in northeast Alabama reflects partly the contrast between the towns in this narrow Appalachian valley and the almost completely white surrounding rural areas. Detailed mapping (not shown), however, indicated that exceptionally high segregation is also due to unusually high proportions of blacks (over 85 percent) in a dozen or so blocks, mostly

widely scattered, in the towns. Such fine-scaled segregation might be found more widely across the United States but could only be uncovered by a close examination of individual counties. However, it illustrates the value of measuring segregation at the block level because such a significant pattern of segregation would have been blurred or partially hidden if block groups or tracts had been the unit of measurement.

The map indicates that most of the older Midwestern cities have suburban counties that are less segregated than the central counties, and the central counties of the Dallas, Los Angeles, San Francisco, and Portland areas have average levels of segregation compared to the low segregation in some of their suburban counties. The effect of suburban location and more recent development is clearest in the Atlanta metropolitan area where the central county (DeKalb County) is highly segregated but the surrounding counties show low levels of segregation. In the three suburban counties that are the least segregated (Douglas, Gwinnett, and Paulding), most blacks have high socioeconomic status compared to other counties in the area, but Paulding County's blacks were exceptional in that they averaged higher

Table 4 Pearson correlations of Hispanic–white segregation (D) and selected variables

Variable	U.S.	Variable	U.S.
Log total population	−0.140	Log% Hispanic	−0.236
Log Hispanic population	−0.296	% Hispanics foreign-born	0.378
% Hispanics in 1990s-built housing	−0.197	% Hispanics immigrated in 1990s	0.387
% Hispanics high school grads	−0.476	Hispanic median household income	−0.278
% Hispanics college grads	−0.304	Hispanic–white income ratio	−0.052*
% Hispanics English proficient	−0.474	% Hispanics homeowners	−0.326
% Hispanics in poverty	0.408		
% Hispanics in government	−0.465	Log% Hispanics in military	−0.105
% Hispanics in agriculture	0.105	% Hispanic veterans	−0.395
% Hispanics manager/professional	−0.434		

Note: *N* = 1,092 counties.

*Not significant at 0.05 level. All other correlations significant at 0.01 level.

incomes than whites and 72 percent lived in homes built in the 1990s.

Many counties in Virginia and Maryland have low or very low levels of segregation. The region represents a varied mixture of older and newer settlements, with several suburban counties outside Washington, DC, characterized by relatively high-status black populations. Farther south, a large number of counties have very low levels of segregation that could result from a mix of factors, including some not known to us.

Black segregation from whites is low in Anchorage and Honolulu, the only areas in Alaska and Hawaii that our study covered, perhaps related to the strong military influence in those areas. Segregation is exceptionally low in the Las Vegas area (Clark County). With 44 percent of that county’s blacks living in 1990s housing, the low segregation seems to epitomize the situation associated with new housing developments in many parts of the country. The map also indicates in the dark blue the exceptionally low segregation in counties where major military facilities are located, including Fort Bragg and Camp Lejeune in North Carolina, Fort Gordon and Fort Stewart in Georgia, Fort Rucker in Alabama, Fort Campbell on the Tennessee–Kentucky border, Fort Sill in Oklahoma, and Fort Hood in Texas.

Results: Hispanic–White Segregation

Correlation Analysis

Hispanics and whites are somewhat more segregated in the less populous counties, especially those with smaller Hispanic populations and lower percentages of Hispanics (Ta-

ble 4). This is consistent with our finding of greater segregation in nonmetropolitan areas, but it is not consistent with metropolitan-scale studies, which have found less segregation in smaller metropolitan areas (Logan, Stults, and Farley 2004; Iceland and Nelson 2008). It appears that measuring segregation at the county level enabled us to uncover evidence of slightly higher segregation in less populated counties. Such counties, many of which probably experienced Hispanic settlement only during the previous decade or two, might be keys to our finding of greater segregation where Hispanic percentages were lower. In any case, at the county level the racial threat hypothesis received no support as an explanation for variations in Hispanic–white segregation.

Such demographic variables are not as strong, however, in explaining county-level segregation as variables describing Hispanic socioeconomic status and the relative acculturation and settlement maturity of local Hispanic communities. Segregation is less where lower percentages of Hispanics live in poverty and higher percentages are high school graduates and homeowners and where more work as managers or professionals. Also less segregated are counties in which lower percentages of Hispanics are foreign born and recent immigrants, consistent with metropolitan area findings (Iceland and Scopilliti 2008).

This is a reminder that not all Hispanic communities are recent developments despite the focus of much research on those new communities. Expressed in terms of acculturation to the mainstream or core culture of the United States, less segregated counties have higher percentages of Hispanic adults speaking

English very well. The lower segregation in counties where higher percentages of Hispanics work more for the government and are military veterans also reflect the relative acculturation of local Hispanic populations. In contrast to the situation with black-white segregation, each of the acculturation and settlement maturity variables has greater explanatory power than the percentage of Hispanics living in housing built in the 1990s. Nevertheless, counties where higher percentages of Hispanics live in 1990s housing are less segregated, a finding consistent with other research on metropolitan areas (Iceland and Nelson 2008).

Surprisingly, however, Hispanic-white segregation levels are only weakly related to the ratio of the average income levels of the two groups. Apparently the other factors previously discussed are much more important than similarity in income levels in providing access to the same neighborhoods as whites. In metropolitan areas, higher Hispanic-white income ratios (indicating more similar incomes) are more strongly associated with lower segregation (Logan, Stults, and Farley 2004; Iceland and

Nelson 2008; Lee et al. 2008). This suggests that the relationship between relative incomes and segregation varies more from county to county in nonmetropolitan areas.

Mapping

The lower average level of Hispanic-white segregation in the West region is evident on the map shown in Figure 2, a confirmation of our earlier finding. This might relate to the many long-established Hispanic communities in the West. Many of these are in nonmetropolitan counties that have been home to whites and Mexican-Americans for more than a century, and both groups have been involved in ranching and mining in these places. The oldest Hispanic settlements in the West are in northwestern New Mexico, where Spanish first settled more than three centuries ago but where acculturation, especially in the last half-century, has been strong.

Low levels of segregation are evident in some suburban counties compared to the central counties of San Antonio, Dallas,

Figure 2 *Hispanic-white residential segregation, 2000. (Color figure available online.)*

Houston, Los Angeles, and San Francisco, as well as in some counties with major military installations. These patterns were also found with respect to black–white segregation but appear to be weaker for Hispanic–white segregation.

The large urban Mexican and Puerto Rican settlements in the central counties of Los Angeles, Phoenix, San Antonio, Austin, Dallas, Houston, Chicago, Cleveland, and New York appear on the map as approximately average in their levels of Hispanic–white segregation. Los Angeles and Cook County (Chicago), however, have *D* values of 68.9 and 68.3, close to one standard deviation above the mean. Miami, with its many Cubans, is less segregated than average, which is consistent with research that demonstrates lower segregation nationally between Cubans and non-Hispanic whites (Iceland and Nelson 2008).

Mapping suggests how typical the level of segregation is in smaller places that experienced recent Hispanic growth and where Hispanic–white interactions have been studied intensively. In all four counties that include Leadville, Colorado; Garden City, Kansas; Nashville, Tennessee; and Charlotte, North Carolina, the level of segregation was neither low nor high compared to all counties. This indicates that spatial aspects of the residential situations described by the authors were not exceptional (Winders 2006; Heimstra 2008; Smith 2008; Stull and Broadway 2008).

Exceptionally high segregation (over two standard deviations above the mean) is characteristic of more than a dozen counties, most widely dispersed and varying a great deal in Hispanic characteristics most relevant to segregation. In the South, Hispanics in those highly segregated counties constitute small populations and small proportions in county populations, have high rates of poverty, are predominantly immigrants, and work to some extent in agriculture. These illustrate findings from our correlation analysis. In contrast, the highly segregated counties of Pennsylvania appear to be an anomaly, perhaps partly because their measured unevenness includes substantial random effects due to very low Hispanic percentage. Hispanics in these small communities are more likely to be U.S. born, speak English very well, and have a median household income approximately equal to that of whites—characteristics that in the United

States as a whole are related to low levels of segregation.

Conclusions

This study demonstrates the great variation among counties in the degree to which minority groups and whites have access to the same neighborhood resources. It extends the large body of research on segregation in metropolitan areas by analyzing segregation in terms of counties and by including nonmetropolitan areas. Measuring segregation in terms of blocks enabled us to identify intricate details of segregation that would have been masked if we had used the larger census tracts or even block groups. This was especially important in nonmetropolitan areas where such units of measurement are frequently much larger in area than in metropolitan areas. Determining levels of segregation in counties made it possible to compare metropolitan and nonmetropolitan areas directly and show for the first time that many metropolitan areas contain substantial internal variations in level of segregation. Also, by distinguishing the South from the rest of the country in our analysis of black–white segregation, we demonstrated regional differences in the importance of key explanatory variables.

Although the West averaged lower levels of segregation than other regions and the Northeast was the most segregated, regional differences in segregation were not large. The South was the focus of the most intensive civil rights efforts a half-century ago, but the South today does not stand out as very different in its level of segregation. Differences in average segregation between metropolitan and nonmetropolitan counties were small, but in all regions segregation was greater in nonmetropolitan counties. These results could be interpreted as indicating widely shared racial and ethnic attitudes and practices across the different regions of the country, but the averaging of county segregation levels over such broad areas obscures important findings at more local scales.

Our most important findings concern how levels of segregation relate to various characteristics of minority populations. Correlation coefficients were highest in relation to variables measuring minority socioeconomic

status. These demonstrated clearly that segregation was lower where blacks and Hispanics had higher socioeconomic status. In Southern counties correlations were so high that both the percentage of blacks in poverty and black median household income explained over a quarter of the variance in level of segregation. Also, nationally the lower levels of segregation associated with higher proportions of minorities living in housing built in the 1990s suggest the likelihood that new residential developments might be settings in which traditional inequalities can be overcome more easily.

Our demonstration of the association between Hispanic acculturation and lower segregation is consistent with spatial assimilation. Counties with military installations and veterans of the armed forces appear also to be important settings for experiencing lower segregation, reflecting the military's well-established policy of desegregation and the substantial acculturation resulting from experience in the armed forces. Even stronger in its correlation was the lower level of Hispanic-white segregation in counties where higher percentages of Hispanics spoke English very well or had been born in the United States.

All of the foregoing findings are similar to those from studies of metropolitan areas at the tract level. This consistency suggests that the MAUP should not necessarily weaken confidence in correlations that are highly significant statistically.

Other results were quite different from findings for metropolitan areas, demonstrating the value of including nonmetropolitan areas in segregation analyses. Hispanic-white segregation was greater in less populated counties—the opposite of results based on metropolitan areas—but our findings are confirmed by the one nationwide study based on urban places in finding higher levels of Hispanic-white segregation in nonmetropolitan and smaller places. Our finding of a negative correlation between segregation and percentage Hispanic is inconsistent with the racial threat hypothesis.

In the South, black-white segregation was also greater in less populated counties and those with smaller black populations. Outside the South, though, the correlations were much weaker. With respect to percentage black, previous studies of metropolitan areas (Logan,

Stults, and Farley 2004; Lee et al. 2008) and urban places (Lichter et al. 2007) found percentage black to be strongly and positively correlated with segregation. Our findings indicate this to be true only outside the South. In the Northeast, Midwest, and West, segregation was consistently greater where percentages of blacks were higher, commonly characteristic of older, larger urban centers that attracted so many black migrants beginning a century ago. These are the places in which perceived racial threat continues as an apparent explanation of segregation.

Perceived racial threat may be a more important factor in segregation than this study indicates. Although researchers have usually measured this in terms of minority percentage in the total population, we expect that in contemporary America it is not all blacks and Hispanics but those of low socioeconomic status that whites find most threatening. Our high and negative correlations between segregation and variables measuring minority status are consistent with this notion. Accordingly, if perceived threat of this type is a significant motivation behind whites' residential decisions, racial threat might be better measured as some function that combines minority percentage and socioeconomic status.

Mapping revealed that some suburban counties in several of the larger metropolitan areas were much less segregated than the older settled central counties. This was the case for some counties outside Los Angeles, San Francisco, Portland, Dallas, Atlanta, and other places depending on the specific segregation being measured. Most dramatic, however, was the very low black-white segregation in many counties outside Washington, DC, and in parts of Virginia. Also clear was the very low Hispanic-white segregation in the historic Spanish-American area of northern New Mexico and in long-established Mexican and white settlements of parts of other Western states.

The degree to which whites and other groups have access to the same neighborhoods and neighborhood-based resources shows many place differences across the country. This study reveals the locations and characteristics of places with high and low segregation to better understand the geography of residential neighborhood inequality in the United States. ■

Notes

¹ Using data on geographical units in Census 2000, we calculated the mean area of blocks in each county that otherwise qualified in our study and arbitrarily eliminated from our study those counties with mean block areas of one square mile or greater (Minnesota Population Center 2004). It seemed likely that such small areas did not include two or more ethnically or racially distinct neighborhoods. This was because the county means of block areas were probably inflated by a few fairly large blocks, but these few must have been overwhelmed in numbers of very small blocks to produce a mean block area of a square mile or less.

² For each region we calculated the mean black–white segregation in central counties of metropolitan areas compared to the suburban counties. There were only very small and, we believe, insignificant average differences between central and suburban counties; the greatest difference was in the South, where the average segregation in suburban counties was 1.9 points less than in central counties. Because of the very small central–suburban county differences found for black–white segregation, we did not calculate these differences for Hispanic–white segregation. It seems likely that those suburban counties with low segregation as evident on the map were counties where minorities had higher socioeconomic status and other characteristics found in our correlation analysis.

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