The Extent of Occupational Segregation in the United States: Differences by Race, Ethnicity, and Gender

OLGA ALONSO-VILLAR, CORAL DEL RIO, and CARLOS GRADIN*

This paper studies occupational segregation by ethnicity/race and gender by following a new approach that facilitates multigroup comparisons and econometric analyses to take into account group characteristics. The analysis shows that segregation is particularly intense in the Hispanic and Asian populations (the situation being more severe for the former given its higher concentration in low-paid jobs). A distinctive characteristic of Hispanics is that segregation is higher for men than for women although females are more concentrated in low-paid jobs. Segregation neither for women nor for African and Native Americans is reduced by taking human capital variables into account.

Introduction

RACIAL AND ETHNIC DIVERSITY IS A DISTINCTIVE CHARACTERISTIC OF THE LABOR MARKET IN THE UNITED STATES. According to the American Community Survey, minorities accounted for about 30 percent of the overall employed population in 2007, with those of Hispanic origin representing the largest share (14 percent) followed by African Americans (11 percent). Given this diverse society, it is not surprising that wage disparities among these groups have been widely documented (see Hirsch and Macpherson 2004; Kim 2002; Kmec 2003; Neal and Johnson 1996) as has residential and school segregation (Cutler, Glaeser, and Vigdor 2008; Farley et al. 1978; Frankel and Volij 2011; Iceland 2004; James and Taeuber 1985; Reardon and Yun 2001). However, additional sources of racial/ethnic inequality in the labor market, such as occupational and workplace segregation, are less well-known (see Carrington and Troske 1998; Hellerstein and Neumark 2008; Tomaskovic-Devey et al. 2006).

* The authors' affiliation is Department of Applied Economics, University of Vigo, Vigo, Spain. E-mail: *ovillar@uvigo.es*

JEL Classifications: J15, J16, J71, D63.

INDUSTRIAL RELATIONS, Vol. 51, No. 2 (April 2012). Published by Wiley Periodicals, Inc., 350 Main Street, Malden, MA 02148, USA, and 9600 Garsington Road, Oxford, OX4 2DQ, UK.

Among the studies exploring occupational segregation from a race/ethnicity perspective, most have focused on explaining black–white (or black–non-black) segregation trends in the second half of the twentieth century; some have also included Hispanic–white (or Hispanic–non-Hispanic) segregation, and others have additionally considered gender differences (Albelda 1986; Blau, Simpson, and Anderson 1998; Kaufman 2010; King 1992; Mintz and Krymkowski 2005; Queneau 2009; Rawlston and Spriggs 2002; Reskin 1999; Spriggs and Williams 1996).

Gender and race/ethnicity disparities in the labor market may emerge from several sources, including individual characteristics, market opportunities, and environmental conditions (see Altonji and Blank 1999; Anker 1998; Huffman, Cohen, and Pearlman 2010; Kaufman 2010; King 1999; Pager and Karafin 2009). According to human capital theory, for example, segregation arises from differences in skills among race/ethnic–sex groups. The worker preference approach sees occupational segregation by sex but not by race or ethnicity because of differences in preferences for jobs. However, these differences are certainly not independent of social norms to the extent that women assume most of the domestic responsibilities, including child and elderly care, which affects not only the types of skills that some women acquire but also their work hours. Other scholars have pointed to the difficulties that arise when women and men work together because of identity conflicts in occupations that are highly masculinized or feminized (Akerlof and Kranton 2000) or status loss perceived by male workers (Goldin 2002).

Language and cultural differences are also likely to be a cause of segregation to the extent that minorities are newly arrived. A lack of English fluency prevents immigrants from filling some types of jobs, even if they have high educational achievements and experience in their countries of origin (even low-skilled jobs may require specific language skills; see Maxwell 2010). In addition, the lack of legal status of many immigrants strongly determines their employment opportunities because the informal economy is traditionally concentrated in some occupations. Moreover, the job opportunities of newly arrived immigrants are likely to depend on migrant networks (Hellerstein, McInerney, and Neumark 2009), which may reinforce the concentration of immigrants of a race/ethnic group in occupations/establishments with a high presence for that group (Patel and Vella 2007).[1]

[1] There may be other factors that affect the job opportunities of workers. Thus, residential segregation by race/ethnicity conditions social networks, employment opportunities, and the provision of public goods (such as transportation), all of which shrink the prospects of some individuals. This is especially the case for newly arrived workers and women because they are more dependent on local opportunities and resources (Joassart-Marcelli 2009).

Apart from the factors listed earlier, the literature has also pointed to discriminatory practices regarding the types of jobs (and promotions) that women and minorities are offered (Baron 1994; Goldin and Rouse 2000; Kaufman 2002; Kim 2002; Reskin 1999). In particular, stereotyping that qualifies individuals according to their sex–race group, together with organizations that qualify jobs by the group that fills them and queuing processes that allocate ''good'' jobs to the advantaged group (white males) explain segregation to a large extent. Moreover, some scholars have found empirical evidence of negative attitudes toward minorities even when the workplace experience of employers does not support the stereotypes of the entire group (Pager and Karafin 2009).

The segregation of both women and racial/ethnic minorities is a matter of concern to researchers and policymakers for a wide range of reasons. Occupational segregation translates into important pay differentials because minorities and women tend to be concentrated in low-paid jobs (Bayard et al. 2003; Kmec 2003; Reskin 1999). In addition, it favors gender and racial devaluation. The sex–race of an individual is an important factor in that individual's work's worth because when segregation exists, socially disadvantaged groups are in weaker positions to resist devaluation (Cohen and Huffman 2003; Huffman and Cohen 2004). This reinforces race–sex stereotypes and fosters poverty, which has important consequences for female-headed households, especially those of African Americans and Latinas (Misra 1999). Moreover, occupational segregation leads to further inequalities so long as jobs vary in terms of employment opportunities. Consequently, unemployment during economic crises may come to bear most heavily on particular race–sex groups insofar as they are concentrated in some types of jobs.

The exclusion of some groups from various occupations also results in a waste of human resources, leading to extremely inefficient results when these individuals are highly skilled people. In addition, it imposes important rigidities, reducing the ability of the market to respond to labor changes, which is a problem in a global economy concerned with efficiency and competitiveness. To the extent that occupational segregation translates into workplace segregation, members of different groups tend to have little interaction among them, which limits the daily experience of workers and makes it difficult to reach a cohesive society. According to Pancs and Vriend (2007, p. 4), ''Segregation enhances a lack of shared language, cultural values and norms. This makes social coordination more difficult. Some have argued that segregation puts the whole idea of a peaceful society with its constitutional and civic liberties at risk.''

When exploring occupational segregation, most scholars have based their analyses on pairwise comparisons either by gender or by race, and little is

known about the differences among ethnic/racial–gender groups (exceptions are Reskin [1999] and Reskin, Hargens, and Hirsh [2004]). This is so, in part, because of the difficulties of offering a general view of the relative performance of each demographic group when many groups are involved because it requires comparisons among all possible pairs. In this paper, we aim to shed some light on the analysis of occupational segregation by ethnicity/race and gender in the United States by comparing the distribution of any demographic group (white male workers included) with the distribution of total employment, which facilitates comparisons among multiple groups. Are Hispanic female workers more segregated than Asians or blacks? Is segregation more severe among women or among men in these groups? To answer these questions, we use several segregation measures recently proposed in the literature (Alonso-Villar and del Río 2010). These indexes allow us to quantify the extent of segregation for each group to determine their relative positions.

Certainly, two demographic groups of the same segregation level might differ in their well-being depending on whether they are concentrated in high- or low-paid occupations. For this reason, this paper also explores the type of segregation experienced by the demographic subgroups, taking into account the economic status of occupations. In addition, this paper investigates the role played by human capital workers' characteristics such as education and English proficiency to explain segregation disparities among groups. This is done using an econometric model in which the occupational segregation of demographic groups—defined on the basis of race/ethnicity, gender, and the metropolitan area (MA) in which they work—depends on those characteristics.

The paper is structured as follows: Background: Segregation in a Multigroup Context offers a review of segregation measurement in a multigroup context, presenting, in particular, the measures that are used in Measuring Occupational Segregation in the United States: Ethnicity/Race and Gender to quantify the extent of segregation of ethnic/racial–gender groups in the United States. Explaining the Occupational Segregation of Ethnic/Race–Gender Groups in Local Labor Markets: A Regression Analysis undertakes the regression analysis. The last section presents the main conclusions.

Background: Segregation in a Multigroup Context

When exploring segregation in the United States, scholars have traditionally considered a dichotomous classification of individuals (blacks–whites, whites–non-whites, women–men, and foreign born–natives) and used measures that involved comparisons among only two groups. In recent years,

this binary case has been extended, and several indexes have been proposed to analyze segregation when three or more groups are involved (Frankel and Volij 2011; Reardon and Firebaugh 2002; Silber 1992). These multigroup measures provide an aggregate or overall segregation value (Iceland 2004; Watts 1995). However, one can be also concerned with the performance of a target group, an issue that gains special relevance in a multigroup context. To address this issue, the literature has mainly opted to undertake pairwise comparisons. Thus, in ethnic/racial analyses, for example, Hispanics are often contrasted with whites, but also with blacks or Asians, while in gender–ethnic studies, black women are compared with either white women or black men. Consequently, these studies measure Hispanic–white segregation, Hispanic–black segregation, black–white female segregation, and so on (e.g., Albelda 1986; Duncan and Lieberson 1958; Iceland 2004; King 1992; Massey and Denton 1987; Queneau 2009; Reardon and Yun 2001).

Alonso-Villar and del Río (2010) proposed a different approach contrasting the distribution of a target group across occupations with the distribution of total employment to explore the performance of that group.[2] This approach places an emphasis on how the various demographic groups fill job positions (all groups shape the employment structure of the economy) and allows easy comparisons among groups. The corresponding segregation measures, labeled local measures, are naturally related to overall measures because when they are aggregated according to the demographic weights of the mutually exclusive subgroups into which the population can be partitioned, they add up to the whole segregation. Consequently, this approach determines the contribution of each demographic group to overall segregation, which allows delving more deeply into the segregation analysis.

Measuring the segregation level of a target group does not imply, however, that the segregation of that group can be determined without taking into account the remaining population subgroups. Local segregation is indeed a phenomenon that requires consideration of the relative position of individuals with respect to others, as is done when measuring overall segregation. Thus, Alonso-Villar and del Río (2010) maintain that the segregation level of a target group can be calculated insofar as the distribution of the group across occupations is compared with the distribution of total employment. These tools are introduced in what follows.[3]

[2] For an empirical implementation of this method in the case of women immigrants in Spain, see Del Río and Alonso-Villar (2012).

[3] These segregation indices and curves can be estimated using the ''Segregation'' module written for Stata (*localseg* ado-file), available from http://fmwww.bc.edu/RePEc/bocode/s.

Local Segregation Curves and Indexes. Let us denote by $c^g \equiv (c_1^g, c_2^g, ..., c_J^g)$ the distribution of the target group g among $J > 1$ occupations (distribution c^g could represent, for example, Hispanic women, black women, or Asian men) and by $t \equiv (t_1, t_2, ..., t_J)$ the employment structure of the economy, where the total number of workers is $T = \sum_j t_j$. Vector t represents the distribution of reference against which that of any population subgroup is compared. The total number of workers in occupation j is $t_j = \sum_g c_j^g$, and the total number of individuals of target group g is $C^g = \sum_j c_j^g$.

To compare the segregation level of several groups (African American, Asian, and Hispanic women, for example), these authors first propose the use of local segregation curves, which are related to the Lorenz curves used in the literature of income distribution. To build the curve for target group g, denoted by S^g, occupations have to be ranked in ascending order of the ratio c_j^g/t_j. Then, the cumulative proportion of employment, $\sum_{i \le j} t_i/T$, is plotted on the horizontal axis, and the cumulative proportion of individuals of the target group, $\sum_{i \le j} c_i^g/C^g$, is plotted on the vertical axis.[4]

Therefore, to build the local segregation curve for Hispanic women, for example, occupations must first be ranked from low to high relative to the presence of Hispanic women (c_j^{Hw}/t_j). Next, the curve is plotted for values between 0 and 1. Thus, at point 0.1, the curve shows the proportion of Hispanic women who work in occupations in which the group has the lowest relative presence and that represent 10 percent of total employment. The curve at 0.2 shows the proportion of the group working in occupations in which the group has the lowest relative presence but representing 20 percent of total employment, and so on.

Consequently, the local segregation curve shows the under-representation of the target group with respect to the employment structure of the economy, decile by decile. In the case where the target group was distributed among occupations in the same manner as the distribution of total employment, the local segregation curve would be equal to the 45° line, and no segregation would exist for that demographic group. The further away the curve is from this line, the higher the occupational segregation of the target group.

Alonso-Villar and del Río (2010) show that when the segregation curve of a distribution is above that of another (which can represent either that of another demographic group or that of the same target group at another period of time),

[4] In a binary context, the overall segregation curve is obtained by comparing the distribution of one population subgroup among organizational units with that of the other subgroup (see Duncan and Duncan 1955).

any local segregation index satisfying some basic properties will conclude that segregation is higher for the lower distribution.[5] This makes the use of these curves a powerful procedure for empirical analysis because it allows identifying those cases in which the conclusions reached are robust against changes in the local segregation index used. However, if the local segregation curves of two distributions cross, or if we are interested in quantifying the extent of local segregation, the use of indexes seems the best course to take. For this reason, the aforementioned authors propose several local segregation indexes related to the above curve:

$$G^g(c^g;t) = \frac{\sum_{i,j} \frac{t_i}{T}\frac{t_j}{T}\left|\frac{c_i^g}{t_i} - \frac{c_j^g}{t_j}\right|}{2\,\frac{C^g}{T}}, \tag{1}$$

$$\Phi_a^g(c^g;t) = \begin{cases} \frac{1}{a(a-1)}\sum_j \frac{t_j}{T}\left[\left(\frac{c_j^g/C^g}{t_j/T}\right)^a - 1\right] \text{if} a \neq 0,1 \\ \sum_j \frac{c_j^g}{C^g}\ln\left(\frac{c_j^g/C^g}{t_j/T}\right) \text{if} a = 1 \end{cases}, \tag{2}$$

$$D^g(c^g;t) = \frac{1}{2}\sum_j \left|\frac{c_j^g}{C^g} - \frac{t_j}{T}\right|, \tag{3}$$

where the first measure is a variation of the classic Gini index, the second represents a family of indexes related to the generalized entropy family (a can be interpreted as a segregation sensitivity parameter), and the third is a variation of the index of dissimilarity.[6]

[5] These properties are symmetry, scale invariance, insensitivity to proportional subdivisions of occupations, and sensitivity to disequalizing movements between occupations. The first property means that in measuring the segregation of a target group, occupations' labels are irrelevant. The second property implies that if the number of individuals of the target group in each occupation doubles, for example, and the number of total jobs in each occupation triples, segregation is unaltered. The third property indicates that if an occupation is divided into two units in such a way that the weight of the target group in each of them is the same ($\frac{c_j^g}{C^g}$) and these units also share a common proportion of total jobs ($\frac{t_j}{T}$), the segregation of the target group does not change. Finally, the fourth property implies that when the target group loses employment in an occupation in favor of another that has the same number of jobs and more positions for the target group, the segregation of the group must increase.

[6] This index has been proposed in a binary context by Moir and Selby Smith (1979) even though its properties in a multigroup context have been studied in Alonso-Villar and del Río (2010). Both D^g and G^g take values within the interval $[0,1)$, while Φ_a^g can easily be transformed to take values within that interval.

Both index G^g and the family of indexes Φ_a^g satisfy the aforementioned basic properties and are therefore consistent with the criterion given by the local segregation curves, so that if the local segregation curve of a distribution dominates another (i.e., if the former lies at no point below another and at some point above the latter), these indices will take a higher value when they are evaluated at the dominated distribution (i.e., the lower distribution). But when curves cross, the conclusion reached with an index may differ from that of others because although these local indexes have some basic properties in common, they disagree regarding additional properties. According to the inequality literature, this is a consequence of the different weights that each index gives to discrepancies between the benchmark and the distribution of the target group in low and high tails.

On the contrary, index D^g, which measures the maximal vertical distance of the curve to the 45° line, is not consistent with the segregation curve criterion (as also happens with the dissimilarity index and the traditional [overall] segregation curve proposed by Duncan and Duncan [1955], in the binary case) because it does not satisfy the property of sensitivity to disequalizing movements.

Finally, it should be noted that the weighted average of several of these local segregation indexes give rise to overall segregation measures existing in the literature. Thus, the mutual information index, M, borrowed from the information theory and characterized by Frankel and Volij (2011) in terms of basic segregation properties, can be written as the weighted average of local segregation index Φ_1^g, because $M = \sum_g (C^g/T)\Phi_1^g$, where g represents each demographic group into which the economy has been mutually and exclusively partitioned. Analogously, the unbounded version of the multigroup Gini index, G, proposed by Reardon and Firebaugh (2002), can be written as $G = \sum_g (C^g/T)G^g$. Finally, the multigroup index of dissimilarity extended by Silber (1992), I_p, can be written as $I_p = \sum_g (C^g/T)D^g$.

Thus, if one is interested in determining whether there are important disparities among groups (let us consider, for example, twelve mutually exclusive race/ethnicity–sex groups), one could first use an overall segregation index (M, G, or I_p) to calculate overall or aggregate segregation by race/ethnicity and gender. One could take a step further to ascertain whether some groups are more segregated than others. Are Hispanic women more segregated than African-American women? To answer the question, the segregation of each group g could be determined using local segregation curves (S^g) and indexes (G^g, Φ_a^g, and D^g). This will allow one to rank the twelve groups according to

their segregation levels. Moreover, taking into account the segregation of each group and its demographic weight in the economy, it is possible to quantify the contribution of each group to overall segregation by gender and race/ethnicity using the aforementioned decompositions. If the researcher were interested in a more detailed analysis of the performance of each group, she or he could use a standard binary measure such as the index of dissimilarity to compare each of the twelve groups with any of the others (this implies that the distribution of total employment is not the benchmark against which to compare the distributions of groups). In that case, statistical techniques would be required to summarize the findings of the pairwise comparisons.

Measuring Occupational Segregation in the United States: Ethnicity/Race and Gender

The data used in this section come from the 2007 Public Use Microdata Sample (PUMS) files of the American Community Survey (ACS) conducted by the U.S. Census Bureau. This survey was conducted throughout the United States using a series of monthly samples jointly accounting for 1 percent of the overall population living in both housing units and group quarters. We have chosen the 2007 rather than the 2008 or 2009 release of the ACS to avoid the distortion produced by the soar in unemployment rates from 2008. In this way, we show the situation when the economy was still strong. After selecting people who were employed, the sample includes 1,399,724 observations. This survey provides a variety of information about the demographic and labor-related characteristics of workers. Regarding race and ethnicity, people are asked to choose the race or races with which they most closely identify and to answer whether they have Spanish/Hispanic/Latino origin. Based on this self-reported identity, we produce six mutually exclusive groups of workers comprising the four major single-race groups that do not have Hispanic origin plus Hispanics of any race and others: whites; African Americans or blacks; Asians; American Indian, Alaskan, Hawaiian, or Pacific Islander natives (referred here for simplicity as Native Americans); Hispanics; and other races (those non-Hispanics reporting some other race or more than one race). These groups will be crossed with gender in most of the analysis. Occupations are considered at a three-digit level of the Census recode classification, which includes 469 occupations based on the 2000 Standard Occupational Classification (SOC) System.

Differences by Either Sex or Race/Ethnicity. Pairwise comparisons have documented that in the 1990s, occupational segregation by gender in the

United States was more intense than segregation by race or ethnicity (Blau, Ferber, and Winkler 2001; Reskin, Hargens, and Hirsh 2004). If we calculate overall multigroup segregation indexes for 2007, we corroborate this previous empirical evidence (see Table 1, where the mutual information index, M; the unbounded version of the multigroup Gini index, G; and the multigroup index of dissimilarity, I_p, are shown).

Using local segregation measures, which involve comparisons between the distribution of each target group across occupations and the occupational structure of the U.S. economy, we can delve deeper in this analysis. Figure 1 shows the local segregation curves for women and men. The horizontal axis represents the cumulative proportion of total employment, while the vertical axis represents the cumulative proportion of individuals of the corresponding group (women or men) once occupations have been ranked from low to high with respect to the relative presence of that group.

The fact that both curves clearly depart from the 45° line reveals not only that both women and men are unevenly distributed across occupations but also that they tend to fill different occupations. In other words, segregation exists not only because of the high concentration of female employment in some occupations but also because of the high concentration of male employment in others (even though the reasons behind those patterns are of a very different nature). Note, however, that occupational segregation is higher for women than for men because the curve of women is below that of men. Moreover, women occupy a more constrained position in the labor market than do men because the segregation curve for women has values sufficiently far from zero at cumulative employment shares higher than those of men.[7]

Figure 2 shows the segregation curves for each ethnic/racial group. In comparing Figures 1 and 2, we find that most ethnic/racial groups are closer to the 45° line than sex groups, which implies lower segregation levels for ethnic groups. This explains why overall segregation by race and ethnicity is lower than overall segregation by sex in the United States. As we will show later, sex segregation is also very important within all racial/ethnic groups because, for each of them, discrepancies with respect to the distribution of total employment are reduced when jointly considering women and men.

Because little is known about the occupational discrepancies among minority groups, we now analyze disparities among the six ethnic/racial groups (Figure 2). Even though the performance of whites seems of lower interest

[7] The classification of occupations could affect the segregation of women (or men) if as a result of disaggregating a broad feminized occupation (secretaries and administrative assistants, for example) into finer occupations, the sex composition of the finer occupations differed among them. For a discussion about the impact of ''in-group bias'' on the official classifications of occupations, resulting in finer distinctions being made in (white) men's occupations, see Baron (1994) and King (1999).

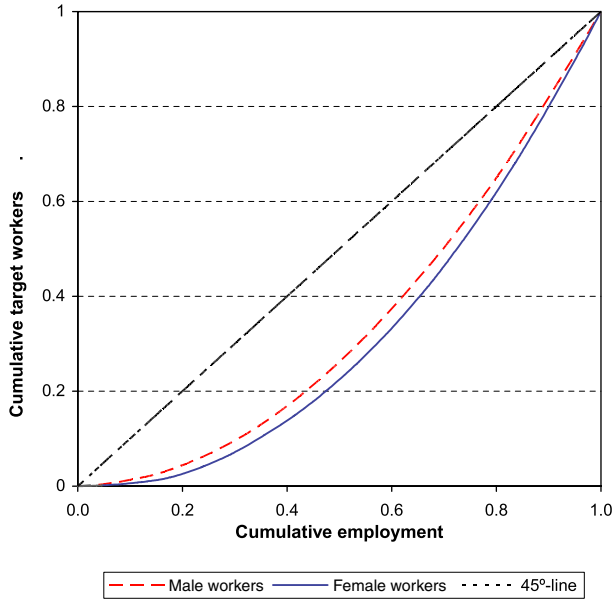
TABLE 1

OVERALL SEGREGATION INDEXES

Overall segregation	M	I_p	G
Ethnicity/race (six groups)	0.07	0.12	0.16
Gender (two groups)	0.20	0.25	0.34

FIGURE 1

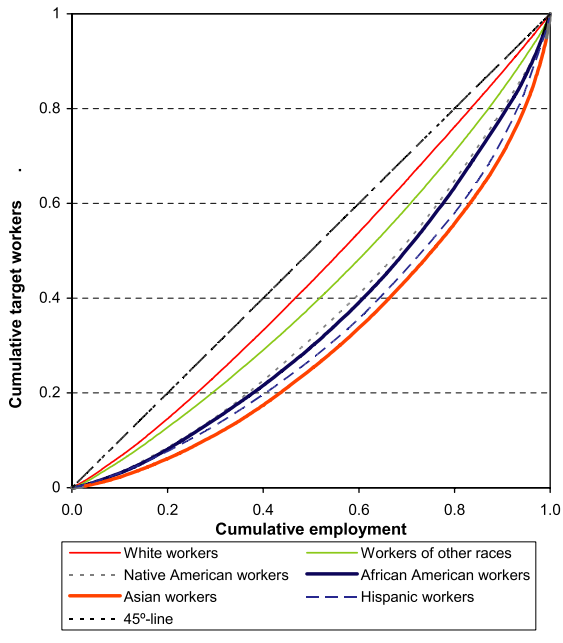
SEGREGATION CURVES FOR WOMEN AND MEN



than that of other groups—they compose a large share of total employment and we therefore expect a lower segregation for that group—it is helpful to understand the relative positions of other groups. Thus, the curve of workers of ''other races'' (which is a small demographic group) is closer to the curve of whites than to those of other groups. The remaining minorities are more distant from the 45° line. Thus, Asians are the demographic group with the highest segregation level, and Native and African Americans have an intermediate magnitude (even though their curves are much closer to those of Hispanics and Asians than to that of whites). The curve of Hispanics crosses those of Native and African Americans before the first decile, so the use of indexes becomes imperative in this case to rank these groups. When calculating these indexes, we find that segregation is always higher for Hispanics compared

FIGURE 2

SEGREGATION CURVES FOR EACH ETHNIC/RACIAL GROUP



with African Americans (see indexes G^g, D^g, and Φ_a^g in Table 2).[8] It is also higher as compared with Native Americans (except for the index that is more sensitive to the bottom of the employment distribution, $\Phi_{0.1}^g$).

Thus, we conclude that Asians and Hispanics are the more segregated groups. To the extent that segregation is based on concentration in low-paid jobs, the groups listed earlier would be in a disadvantaged position compared with the remaining racial/ethnic groups. To examine this issue, Figure 3 provides the density function of the three largest minorities and whites across occupations (ranked from lowest to highest average hourly wage).[9] We see that African Americans (and also Native Americans, omitted here for simplicity) tend to be concentrated in low-paid occupations. This is even clearer in the case of Hispanics. This minority includes relatively low-educated Puerto Ricans and Mexicans (some of the latter being undocumented; Hansen 2006)

[8] By using the coworker segregation measure, Hellerstein and Neumark (2008) also give evidence that workplace segregation between Hispanics and whites is remarkably higher than segregation between blacks and whites.

[9] We have trimmed the tails of the hourly wage distribution to prevent data contamination from outliers. Thus, we computed the trimmed average in each occupation eliminating all workers whose wage is either zero or situated below the first or above the 99th percentile of positive values in that occupation.

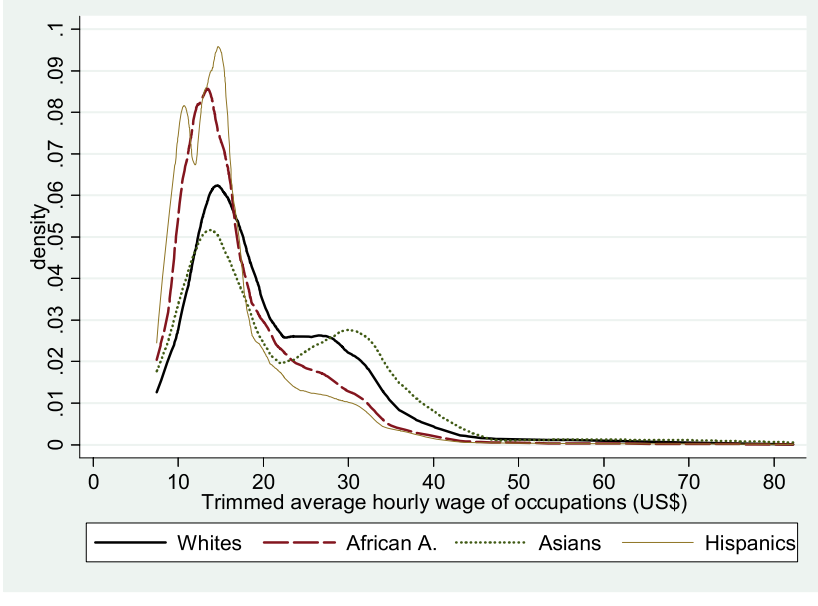
TABLE 2

LOCAL SEGREGATION INDEXES: ETHNICITY/RACE

Local segregation: ethnicity/race	$\Phi^g_{0.1}$	$\Phi^g_{0.5}$	Φ^g_1	Φ^g_2	D^g	G^g	Population (%)
Whites	0.016	0.016	0.015	0.014	0.067	0.093	69.1
Hispanics	0.185	0.185	0.191	0.231	0.243	0.338	13.8
African Americans	0.145	0.139	0.136	0.147	0.209	0.289	10.6
Asians	0.264	0.247	0.260	0.371	0.264	0.377	4.5
Other races	0.065	0.048	0.046	0.048	0.119	0.166	1.3
Native Americans	0.190	0.134	0.130	0.159	0.191	0.270	0.7
							100%

FIGURE 3

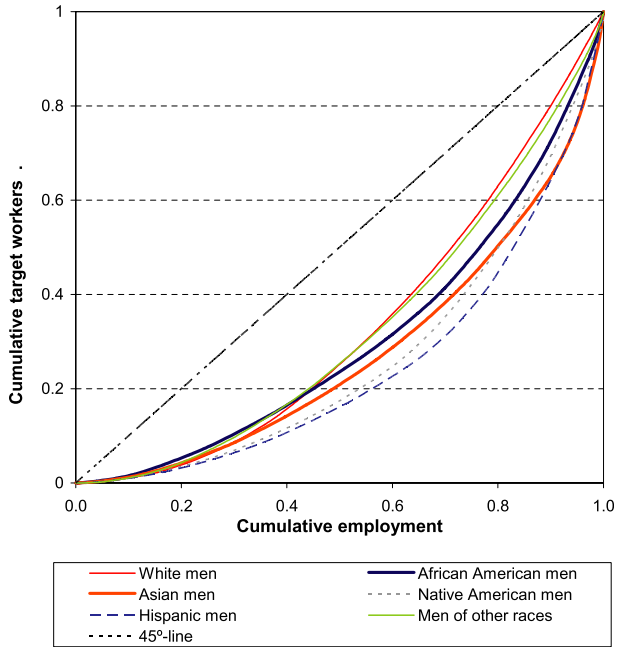
DENSITY FUNCTIONS FOR ETHNIC/RACIAL GROUPS USING THE ADAPTIVE KERNEL ESTIMATION METHOD WITH A GAUSSIAN KERNEL FUNCTION



as well as Cubans, who enjoy higher education and support of the United States (Browne 1999). But wage inequality among Hispanics is not too high, and its density function shows two modes relatively close to each other. On the contrary, Asians are markedly bipolarized between some low-paid occupations (such as ''miscellaneous personal appearance workers,'' ''tailors, dressmakers, and sewers,'' and ''sewing machine operators'') and highly paid occupations linked to scientific, medical, and computer engineering jobs. In

FIGURE 4

SEGREGATION CURVES FOR MALE ETHNIC/RACIAL GROUPS



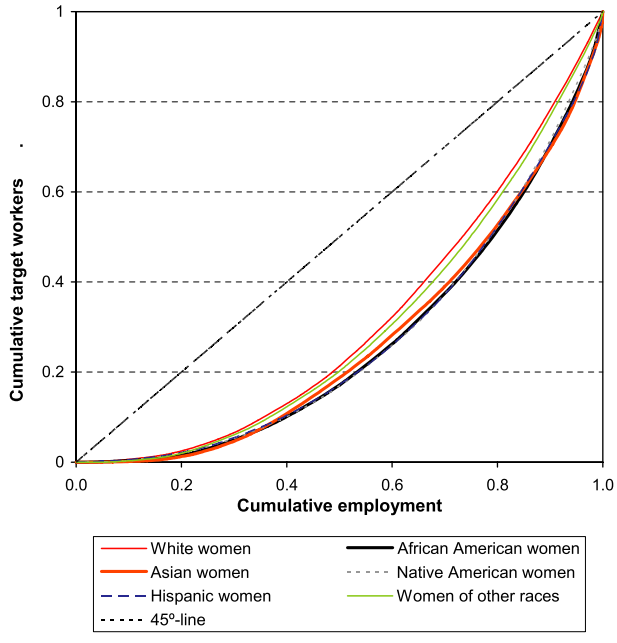
this case, the bipolarization might be a consequence of the remarkable differences that exist between the performance of Southeast Asians and Indians/Chinese (Reskin, Hargens, and Hirsh 2004). Therefore, in spite of the high heterogeneity within Hispanic and Asian groups shown in the literature, the relative economic success of advantaged Hispanics does not seem to offset the lower position of the disadvantaged, which explains the proximity between the two modes, while the asymmetries are much more remarkable for Asians.

Differences Across Race–Ethnic–Sex Groups. We now analyze the intersection between race/ethnicity and sex. In doing so, twelve groups are considered, and segregation curves are estimated separately for men and women in each ethnic/racial group (Figures 4 and 5). This will allow us to ascertain whether disparities among minorities affect women and men in the same way.

As expected, the segregation levels are higher than those displayed in Figure 2 because our previous analysis did not include gender disparities within each group. The examination of these curves also reveals that disparities are much larger among male groups than among female groups. This is consistent with previous findings obtained by Reskin, Hargens, and Hirsh (2004) in their

FIGURE 5

SEGREGATION CURVES FOR FEMALE ETHNIC/RACIAL GROUPS



detailed binary comparisons of sixty ethnic–race–sex groups, as well as by Spriggs and Williams (1996). In addition, we find that although males of all races and ethnicities are present in almost all occupations, there are many in which female groups do not work. For each female group, we find that there are almost no members of the group working in at least 10 percent of jobs in the sample—the first decile of the total employment distribution—and there are only a few in the second decile.

It is interesting to note that the ranking of segregation among male groups by ethnicity/race differs from the ordering shown in Figure 2 for males and females considered together. Indeed, the segregation curve of white men crosses those of other groups (even though the indexes shown in Table 3 reveal that this is still the group with the lowest segregation). In fact, the curve for African Americans starts above that of whites, but afterward it is clearly below, which suggests that black men can be found in a wider range of occupations, even though they tend to concentrate in some of them at a larger extent. In addition, Hispanics and Asians switch their relative positions because Hispanic males become the most segregated group according to a majority of indexes (even though there are crosses between the curves of

TABLE 3

LOCAL SEGREGATION INDEXES: RACE/ETHNICITY AND GENDER

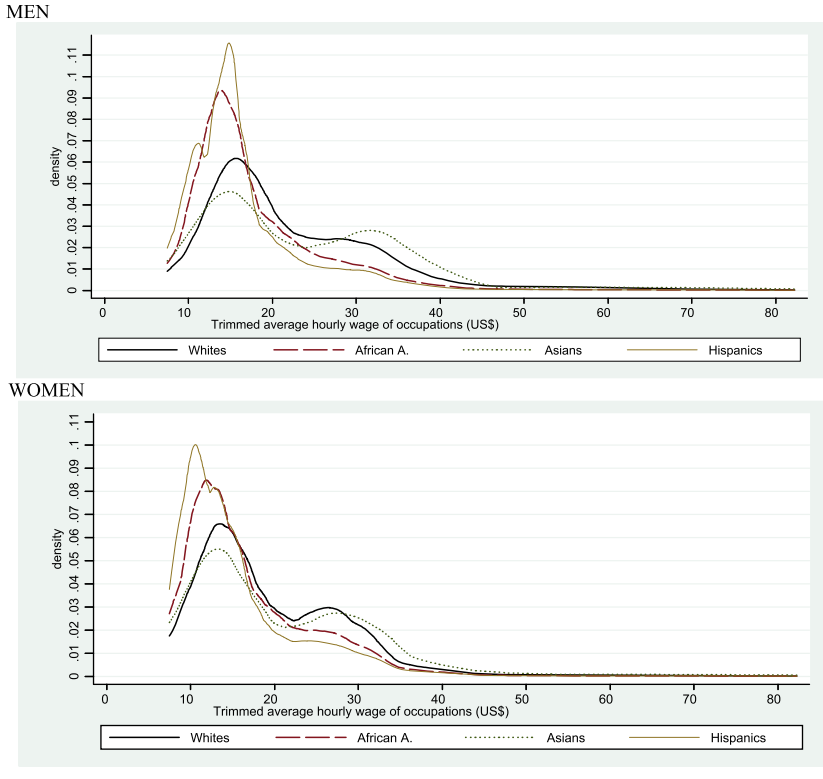
Local segregation: ethnicity/race and gender	$\Phi^g_{0.1}$	$\Phi^g_{0.5}$	Φ^g_1	Φ^g_2	D^g	G^g	Population (%)
White females	0.380	0.304	0.255	0.225	0.287	0.384	69.2
Hispanic females	0.534	0.412	0.378	0.452	0.340	0.466	12.0
African-American females	0.597	0.434	0.381	0.417	0.338	0.469	12.2
Asian females	0.810	0.459	0.395	0.529	0.319	0.459	4.5
Females from other races	0.749	0.364	0.288	0.262	0.298	0.406	1.4
Native-American females	0.890	0.436	0.369	0.400	0.340	0.464	0.7
							100%
White males	0.273	0.230	0.199	0.175	0.248	0.340	69.0
Hispanic males	0.481	0.447	0.448	0.588	0.388	0.510	15.4
African-American males	0.282	0.260	0.253	0.290	0.289	0.391	9.2
Asian-males	0.390	0.356	0.372	0.550	0.318	0.448	4.5
Males from other races	0.369	0.242	0.210	0.207	0.249	0.350	1.3
Native-American males	0.544	0.391	0.372	0.466	0.355	0.469	0.6
							100%

Hispanics and those of Asians and Native Americans). On the contrary, the curves of Hispanic, African American, and Native American female workers are almost indistinguishable and are close to the curve of Asians. The local indexes do not allow ranking these groups either because the results strongly depend on the index used. This suggests that these four female groups have a similar level of segregation across occupations, a level that is clearly higher than that of white females and women of ''other races.''

If we compare women and men for each racial/ethnic group, we ascertain that for whites, blacks, and ''other races,'' segregation is unambiguously higher for women (see Table 3), as when we compared women and men for the whole population. With respect to Asians and Native Americans, the curves cross, but most indices also show that segregation is higher for women (especially according to those measures that penalize to a larger extent those distributions in which the presence of the group in the first deciles is very low, as in the case of $\Phi_{0.1}$ and $\Phi_{0.5}$). What is more striking is that in the case of Hispanics, most of the indexes show higher segregation for men than for women, which shows an important difference between this and the remaining groups. The lower segregation of Hispanic women does not imply, however, better jobs for them. In fact, by comparing the density functions of Hispanic women and men (Figure 6), we see that the former is a translation of the latter to the left. This pattern is common to all ethnic/racial groups, but in this case, the movement is so intense that the first mode found in the density function of Hispanics, shown in Figure 3, seems to include a high proportion of women,

FIGURE 6

DENSITY FUNCTIONS FOR ETHNIC/RACIAL–SEX GROUPS USING THE ADAPTIVE KERNEL ESTIMATION METHOD WITH A GAUSSIAN KERNEL FUNCTION



while the second mode includes mainly men. On the contrary, in the case of Asians, the two modes exist in the density functions of both women and men.

Explaining the Occupational Segregation of Ethnic/Race–Gender Groups in Local Labor Markets: A Regression Analysis

The previous section provided evidence of segregation disparities among ethnic/racial–gender groups at the national level. However, the experience of a demographic group may also depend on the characteristics of the local labor market in which it works (Abrahamson and Sigelman 1987; Catanzarite 2000; Cohen and Huffman 2003; Huffman and Cohen 2004), particularly with respect to the mix of jobs it offers and also the tolerance toward minority

groups (black women historically have been more segregated in the South; see King 1992). In this section, we use the large geographic variability in both segregation and characteristics of demographic groups across local markets in the United States to delve deeper in the segregation phenomenon.[10] In doing so, we undertake a regression analysis to estimate the effect of belonging to an ethnic–gender group on the level of occupational segregation while controlling for other group characteristics (education, English proficiency, and immigration). The geographic variability will also be used to make a statistical inference about segregation differentials across groups.

To implement the analysis, we calculate the segregation level of each demographic group in each local market separately (this will be our dependent variable in the regression analysis). By local markets, we mean the 269 MA that can be either metropolitan statistical areas (MSA) or consolidated metropolitan statistical areas (CMSA) as defined by the 2000 Census.[11] We now use the two-digit level Census recode classification of occupations (twenty-two categories) to avoid occupations with no or very few workers instead of the three digits (469 categories) used in the previous section.[12]

We obtain the results using two different datasets. On the one hand, we use the largest available dataset covering the period of analysis, the 2005–2007 ACS 3-year PUMS file with a sample size of 3,305,315 people working in MAs (3 percent PUMS files). On the other hand, because in this database there are areas and demographic groups with a small sample size, we also use the 5 percent PUMS files of the 2000 Decennial Census, with 5,047,783 sampled workers. This allows us to check the robustness of the results obtained with the ACS data. Furthermore, to tackle the potential bias of small units that could lead to an overestimated segregation of smaller demographic groups in local markets, we include in the analysis only those cells with at least a total of 220 sampled workers in the survey. The total number of observations (or

[10] The values of segregation indices and covariates substantially diverge across local markets not only between demographic groups but also within these groups. See the mean values and corresponding standard deviations in Table A1 (column 1) in the Appendix. For an analysis of spatial disparities across states in terms of racial/ethnic segregation, see Gradín, del Río, and Alonso-Villar (2011).

[11] The only MA not used in the analysis, because of its small size, is Grand Junction, Colorado. Workers have been assigned to the MA using the information from the Public Use Microdata Area (PUMA) corresponding to the place of work available in publicly accessible Census files, which, in some cases, requires assigning a given PUMA to the MA in which it has a greater population. Workers with a job abroad have been removed from the sample, and workers with a job but not currently working have been assigned according to their area of residence. Our results have been shown to be robust with respect to the removal of those MAs with smaller samples (fewer than 4,000 workers).

[12] Occupations labeled as ''agriculture workers'' and ''fishing and hunting, and forest and logging workers'' have been jointly considered to avoid a lack of data for some areas. This criterion is also used in the Current Population Survey recode. Further, for the same reason, the occupation labeled as ''armed forces'' was joined to its most closely related one, ''protective service occupations.''

cells) used in the regression analysis is therefore 1,037 (ACS) and 1,181 (Census). Each observation (or cell) corresponds to a given ethnic/racial–gender group working in a specific local market, such as black females working in the Pittsburgh MSA.[13]

We first present the simplest linear specification. Thus, in Table 4, segregation of demographic groups is assumed to depend only on their race/ethnicity and gender: *Segregation = f(gender, race/ethnicity)*. This allows us to measure the (unconditional) effect of these demographic attributes. We measure segregation for each demographic group at each local market using index Φ_1^g. We use this index because, among those of its family, it is less sensitive to the extremes of the employment distribution (and, thus, to possible outliers). Later, we will discuss how the results change with other indices. Regarding the reported robust standard errors, we have calculated them considering observations ''clustered'' across MAs (then violating the standard i.i.d. assumption). The coefficients of this ANOVA model should be interpreted as the differential with respect to the omitted category (respectively, male and white) predicted by the model for our data. This allows us to test whether differentials in segregation levels across demographic groups defined over gender and race are statistically significant using linear Wald tests based on the estimated parameters.[14]

The results show that all estimated differentials (except for ''other races'') are positive and significant. The largest differentials between the average segregation of any minority group and that of whites are observed for those of Hispanic and Asian origin in both datasets. The fact that groups of men and women of Hispanic origin are on average more segregated than Asians is in line with results in the previous section (Table 3) even though segregation is now measured at local markets with twenty-two occupations.[15] Female ethnic groups are more segregated on average than male groups, also in line with Table 3 (and Figures 4 and 5), and the differential between women and men, regardless of race, is lower than that of minorities, except for ''other races.'' This does not contradict the fact that the overall segregation between women

[13] White women and men are present in 268 of 269 MAs in the 2000 Census (the only omission being Laredo, Texas). Our data, however, are more unbalanced with respect to minorities. Thus, Hispanic males (females) are only considered in 113 (86) MAs; black males (females) are in 129 (135); Asian males (females) in 45 (40); Native American males (females) in 15 (17); and men (women) from other races in 34 (31). In the ACS file, the figures are a bit smaller for minorities: Hispanic males (females) are found in 97 (81) MAs; black males (females) in 85 (102); Asian males (females) in 39 (37); Native American males (females) in 9 (8); and men (women) from other races in 22 (21).

[14] In what follows, statistical significance is generally set at 5 percent of the significance level.

[15] This is consistent with the fact that in the previous section we saw that at the national level (and 469 occupations), men of Hispanic origin were more segregated than Asians while women of both groups had similar levels of segregation (Table 3). Had we constructed Table 4 based on groups defined only on the basis of race/ethnicity, Asians would show slightly higher levels of segregation than Hispanics.

TABLE 4

REGRESSIONS FOR SEGREGATION (Φ_1) BY RACE/ETHNICITY AND GENDER ACROSS LOCAL MARKETS

Dataset	2000 Census	2005–2007 ACS
Female	0.024*** (0.004)	0.024*** (0.005)
African American	0.069*** (0.004)	0.062*** (0.005)
Asian	0.101*** (0.013)	0.099*** (0.011)
Native American	0.037*** (0.011)	0.071*** (0.012)
Hispanic	0.142*** (0.010)	0.173*** (0.013)
Other races	−0.002 (0.006)	0.002 (0.008)
Intercept	0.158*** (0.002)	0.162*** (0.003)
No. of observations	1,181	1,037
R^2	0.337	0.348

NOTE: Robust standard errors are shown in parentheses.
***$p < 0.01$.

and men is larger than the overall segregation based on ethnicity/race. It should be noted that the estimate of ''female'' in the first column in Table 4 refers to the differential between the predicted average segregation of female ethnic/racial groups and that of male groups (across local markets), while the overall gender segregation is the weighted sum of segregation for men and women (at the national level).

Table 5 reports the results for alternative specifications of the linear regression in which additional characteristics are controlled for. The first column for each dataset reports estimates using eleven dummies, one for each gender–ethnicity/race group except for white men, the reference category.[16] Unlike the specification in Table 4, here we take into consideration the fact that segregation levels can differ by sex within the same race/ethnicity. The estimated coefficients represent the average differential of segregation between each group and white males, but comparisons are possible among any pair of groups using linear Wald tests.[17] Hispanic males show the largest differential with respect to white men (0.235 or 0.293 depending on the dataset), followed again by Asians (0.138 or 0.143). Based on linear Wald tests, we find that minority–white differentials in segregation are on average significantly larger for males than for females, except for African Americans and those of ''other races'' in the ACS.[18] In line with the results displayed in the previous section,

[16] The fact that in the regression analysis minorities and women are compared with white men rather than to any other group does not alter the results. It should be noted that the segregation indices we use are based on comparisons between each target group and the distribution of total employment.

[17] We find that the differential between any pair of male groups is statistically significant except between whites and ''other races'' and between African and Native Americans in both datasets, and between Asians and Native Americans in the ACS. However, there are more cases with no significant differences between ethnic/racial groups among females.

[18] The differential between Native Americans and whites for males is also significantly larger than for females at significance level of 6 percent or higher.

TABLE 5

REGRESSIONS EFFECTS FOR SEGREGATION (Φ_1) BY RACE/ETHNICITY AND GENDER ACROSS LOCAL MARKETS

Dataset	2000 Census				2005–2007 ACS			
Model specification	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
White female	0.074*** (0.002)	0.074*** (0.002)	0.074*** (0.003)	0.093*** (0.004)	0.077*** (0.003)	0.077*** (0.003)	0.078*** (0.003)	0.087*** (0.006)
African-American male	0.083*** (0.006)	0.081*** (0.007)	0.080*** (0.007)	0.100*** (0.015)	0.067*** (0.006)	0.060*** (0.008)	0.058*** (0.008)	0.081*** (0.017)
African-American female	0.127*** (0.005)	0.123*** (0.006)	0.124*** (0.006)	0.159*** (0.014)	0.132*** (0.007)	0.121*** (0.009)	0.120*** (0.008)	0.151*** (0.016)
Asian male	0.138*** (0.019)	0.158*** (0.022)	0.046 (0.047)	0.024 (0.046)	0.143*** (0.018)	0.153*** (0.022)	−0.019 (0.040)	−0.05 (0.042)
Asian female	0.136*** (0.009)	0.160*** (0.012)	0.044 (0.041)	0.036 (0.042)	0.131*** (0.009)	0.145*** (0.013)	−0.035 (0.039)	−0.054 (0.043)
Native-American male	0.087*** (0.016)	0.117*** (0.019)	0.095*** (0.017)	0.129*** (0.022)	0.102*** (0.025)	0.123*** (0.033)	0.106*** (0.034)	0.135*** (0.038)
Native-American female	0.064*** (0.011)	0.098*** (0.014)	0.071*** (0.019)	0.124*** (0.025)	0.116*** (0.015)	0.138*** (0.018)	0.120*** (0.030)	0.157*** (0.034)
Hispanic male	0.235*** (0.014)	0.238*** (0.017)	0.009 (0.033)	0.037 (0.037)	0.293*** (0.019)	0.293*** (0.024)	0.013 (0.036)	0.033 (0.044)
Hispanic female	0.102*** (0.006)	0.110*** (0.008)	−0.063* (0.035)	−0.012 (0.038)	0.112*** (0.007)	0.120*** (0.011)	−0.059* (0.035)	−0.027 (0.040)
Other races male	0.010 (0.008)	0.034*** (0.011)	−0.007 (0.016)	0.011 (0.017)	−0.001 (0.012)	0.018 (0.015)	−0.010 (0.013)	0.009 (0.017)
Other race female	0.061*** (0.007)	0.087*** (0.009)	0.051*** (0.014)	0.087*** (0.016)	0.084*** (0.012)	0.106*** (0.015)	0.089*** (0.019)	0.111*** (0.022)
% Speaking English very well			0.001 (0.001)	0.001 (0.001)			−0.001 (0.001)	−0.001 (0.001)
% Speaking English well			−0.002 (0.003)	−0.002 (0.003)			0.007*** (0.002)	0.007*** (0.002)
% Speaking English not well/not at all			0.009*** (0.001)	0.006*** (0.002)			0.006*** (0.001)	0.005*** (0.002)
% High school				−0.002 (0.001)				−0.001 (0.002)
% Some college or associate degree				−0.005*** (0.001)				−0.003* (0.002)
% Bachelor or higher				0.000 (0.001)				0.000 (0.002)
MA fixed effects		x	x	x		x	x	x
Intercept	0.133*** (0.002)	0.129*** (0.003)	0.121*** (0.004)	0.340*** (0.087)	0.135*** (0.002)	0.134*** (0.004)	0.128*** (0.005)	0.245 (0.153)
No. of observations	1,181	1,181	1,181	1,181	1,037	1,037	1,037	1,037
R^2	0.487	0.610	0.702	0.728	0.534	0.627	0.712	0.720
Pseudo-R^2		0.489	0.609	0.642		0.490	0.604	0.613
Wald test (new regressors)			28.33***	10.78***			25.26***	2.68**

NOTE: Robust standard errors are shown in parentheses.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

females of Hispanic origin show significantly lower segregation on average than their male counterparts. The opposite is true for whites, African Americans, and ''other races,'' but for Asians and Native Americans, there is no statistical difference by sex.

To measure the potential effect of the local markets in which minorities are located, MA fixed effects have been added in the second column of each dataset in Table 5, thus assuming that *Segregation = f(gender, race/ethnicity; MA)*.[19] After unobserved geographic heterogeneity is taken into account, the differentials with respect to white men are generally larger, especially for Asians, Native Americans, and people of ''other race.'' But the differential slightly decreases for African Americans. The ranking among groups is roughly preserved, however. This indicates that this uneven geographic distribution does not explain the differentials observed in segregation levels across groups.

Discarding the geographic explanation for the high segregation of minorities, we now explore the role of human capital characteristics such as English fluency and educational achievements. For this reason, the other two model specifications inquire to what extent controlling for those factors reduces the differentials in segregation with respect to white males by race/ethnicity and gender: *Segregation = f(gender, race/ethnicity; MA, English proficiency, education)*. To better understand the role of each of these two characteristics, we introduce them consecutively.

A large share of American workers is comprised of recent immigrants to the United States, mainly from Hispanic and Asian countries, who often lack the ability to speak English, which is required in most jobs. This is an important factor in understanding the occupational segregation of some minorities because we find that segregation decreases dramatically with the English level that workers report (see Figure A1). However, English fluency does not seem to affect all races and ethnicities in the same way. It appears to be an important source of segregation for Hispanics, but not for other groups (see Figure A2).[20]

[19] Segregation could be higher in some areas because of its industrial specialization, higher discrimination against minorities, or even the small units problem (the higher random probability of segregation as unit size declines; Tomaskovic-Devey et al. 2006). Including MA fixed effects allows us to control for these and other factors, and it also helps to reduce possible biases coming from the unbalanced number of demographic groups in our sample. We have also estimated an alternative specification in which we have used regional rather than MA fixed effects, additionally controlling for the population size of the MA. The results are similar and show that in both datasets, segregation tends to be higher in the South Atlantic, East and West South Central regions, as well as in smaller MAs.

[20] This result is in line with that obtained by Hellerstein and Neumark (2008), who find that nearly one-third of workplace segregation between Hispanics and whites is explained by language segregation. Even though the analysis has not been included in the paper, we find that segregation also decreases more sharply for Hispanics than for Asians when the number of years of residence in the United States increases.

For this purpose, the third column for each dataset in Table 5 reports the estimates after including a set of other covariates that control for the level of English fluency attained by each demographic group in each local market, defined as the proportion of the population in each category (see Table A1, for average values), where the omitted variable to avoid multicollinearity is the percentage of workers who speak only English. The estimated coefficients of the new regressors, which are jointly significant, show that segregation tends to be higher when the proportion of workers in a group with a low ability to speak English is larger. Interestingly, the results show that after controlling for these covariates, the level of segregation of Asian and Hispanic males is not significantly different from that of whites, while the differential for African and Native American males remains high and significant. Similarly, the segregation level of Hispanic females becomes much lower than that of their white counterparts (with the difference being statistically significant). As a result, a substantial part of the segregation level of mostly immigrant minorities such as Latinos and Asians is clearly associated with their larger share of population with low English proficiency.

As with English fluency, we also find remarkable disparities among racial/ethnic groups when comparing the occupational distribution of individuals having common educational achievements.[21] On the one hand, there are notable differences in the types of occupations filled by highly educated Asian and Hispanic workers, and between them and the remaining highly educated groups (see Figure A4).[22] On the other hand, among workers with a low educational level, whites are remarkably less segregated than others. To take into account these effects, in the regression analysis, we control for educational achievements, as well. The last specification in the fourth column of Table 5 adds, as an explicative factor, the percentage of the population in each group for each educational level, omitting the percentage with less than a high school

[21] It is useful to consider a common educational level among groups because occupational segregation strongly varies among educational groups. Thus, those workers with an intermediate educational level (some college) have lower segregation than those with less than a high school diploma or with a bachelor's degree (Figure A3). This might be a consequence, on the one hand, of the nature of the occupations to which highly educated workers applied and, on the other hand, of the constraints that low-skilled workers encounter in getting a better job.

[22] This is likely to depend on the stronger concentration of Asians in highly paid occupations (computer software engineers, computer and information system managers, management analysts, physicians and surgeons, dentists, and pharmacists). Highly educated Hispanics are the group with the lowest segregation, perhaps because their presence in low-paid occupations is not negligible (installation, maintenance, and repair workers; graders and sorters of agricultural products; shoe and leather workers and repairers; preschool and kindergarten teachers; and miscellaneous woodworkers, among others). This may explain why they are more evenly distributed across occupations. This finding is consistent with that of Chiswick and Miller (2009), who showed that highly educated immigrant men tend to be more overeducated in the U.S. labor market than native-born men, even though they are not distinguished by race/ethnicity.

diploma (see Table A1, for average values). These estimated coefficients show that segregation is lower when the proportion of workers with an intermediate educational level, that is, those with a high school diploma who have not obtained a bachelor's degree, is higher. This indicates that consistent with our previous results, the relationship between segregation at local markets and education is *U*-shaped.[23]

After controlling for both the ability to speak English and education, the differentials by race continue to be lower for females than for males (the only exceptions are ''other races'' in both datasets and Native Americans in the ACS), in line with what was obtained in previous specifications. Further, the explicative power of including education, once English proficiency has been accounted for, is rather small (but jointly significant). Indeed, it increases rather than reduces the differential for white females and African Americans and Native Americans of either sex, generally increasing the gender gap in segregation for most groups. Thus, segregation neither for women nor for the largely native-born ethnic minorities of African and Native Americans is reduced by taking human capital variables into account.[24]

The main qualitative results discussed earlier hold when measuring local segregation according to other indexes as a dependent variable (see Table A2), although the effects associated with females of any race and Native American males are larger when the index is more sensitive to the bottom of the distribution (occupations where the group has a scarce presence).

Conclusions

This paper has presented evidence of important inequalities in the distributions of ethnic/racial–gender groups across occupations in the United States. We have followed a new approach that facilitates comparisons in a multigroup context when many groups are involved. Thus, although racial–gender segregation analyses undertaken so far require pairwise comparisons between the target group and the remaining demographic groups to ascertain the performance of that group, our analysis involves only comparisons between the distribution of the target group across occupations and the distribution of total employment. This approach has permitted us to perform not only a detailed

[23] Obviously, there is a high correlation between education and English proficiency, so including both sets of variables in the regression can cause multicollinearity problems. For that reason, in Table 5, we keep a model with only one of these variables [specification (3)]. We choose English proficiency because it has the largest impact on race coefficients.

[24] There are some differences in the level of differentials of segregation across groups in 2000 and 2005/2007 datasets, but none of these are statistically significant.

examination of the segregation of each minority group at the national level but also an econometric analysis that makes use of the geographic variability of both segregation and characteristics of these groups across local labor markets.

We found that occupational segregation is particularly intense among Hispanics and Asians. The latter is the most segregated group when segregation is measured at the national level using the overall distribution of employment as the benchmark, while the former stands as the group that on average faces more segregation across the country when local markets are taken as a reference. But segregation does not affect all minorities in the same manner. More than Asians or whites Hispanics, African Americans, and Native Americans tend to concentrate in low-paid occupations, and they also differ in the factors that help to explain such differences.

Demographic groups with a larger share of workers with low English proficiency or with either low or high educational levels tend to show a higher observed segregation. After controlling for the human capital characteristics of each group (and geographic variables), it appears that the segregation of minorities with a large share of recent immigrant population (Asians and Hispanics) reduces significantly. In the case of males, these two highly segregated minorities achieve on average a segregation level similar to whites after controlling for their characteristics. However, the segregation levels of African and Native Americans tend to increase once those characteristics have been taken into account and, consequently, these two groups stand out as the most segregated.

The analysis also showed that segregation patterns are very similar across groups of low-skilled workers of minorities, but there are differences in the occupational distributions of highly educated workers by race/ethnicity. Thus, on the one hand, highly educated Hispanics are more evenly distributed than any other racial group across a wider range of occupations, including low-paid jobs. This is a sign of a higher degree of over-education, a characteristic of certain types of immigration. On the other hand, Asians with a university degree tend to concentrate on a narrower range of occupations than other groups, particularly on selected high-skilled jobs related to medical and engineering services.

The study also revealed that segregation is generally higher for women than for men and that this differential is not reduced after having controlled for spatial and human capital characteristics of the groups (in fact, it increases after controlling for education). Furthermore, disparities by race and ethnic origin are much larger among male groups than female groups. In fact, the distributions of Hispanic, African American, and Native American women across occupations are pretty similar (as well as that of Asians). Only Hispanic female workers show a distinctive feature because unlike other groups, according to

most indexes, their segregation is lower than that of Hispanic men (who are the most segregated males). However, Hispanic women are the group with the largest concentration in the low-paid jobs of the U.S. economy.

REFERENCES

Abrahamson, Mark, and Lee Sigelman. 1987. ''Occupational Sex Segregation in Metropolitan Areas.'' *American Sociological Review* 52: 588–97.

Akerlof, George, and Rachel Kranton. 2000. ''Economics and Identity.'' *The Quarterly Journal of Economics, CXV* 3: 715–53.

Albelda, Randy. 1986. ''Occupational Segregation by Race and Gender, 1958–1981.'' *Industrial and Labor Relations Review* 39(3): 404–11.

Alonso-Villar, Olga, and Coral del Río. 2010. ''Local versus Overall Segregation Measures.'' *Mathematical Social Sciences* 60: 30–38.

Altonji, Joseph G., and Rebecca M. Blank. 1999. ''Race and Gender in the Labor Market.'' In *Handbook of Labor Economics*, Vol. 3C, edited by Orley Ashenfelter and David Card, pp. 3143–259. Amsterdam: Elsevier.

Anker, Richard. 1998. *Gender and Jobs*. Geneva: International Labour Office.

Baron, James N. 1994. ''Organizational Evidence of Ascription in Labor Markets.'' In *Equal Employment Opportunity. Labor Market Discrimination and Public Policy*, edited by Paul Burstein, pp. 71–83. New York: Walter de Gruyter Inc.

Bayard, Kimberly, Judith Hellerstein, David Neumark, and Kenneth Troske. 2003. ''New Evidence on Sex Segregation and Sex Differences in Wages from Matched Employee-Employer Data.'' *Journal of Labor Economics* 21(4): 887–922.

Blau, Francine D., Marianne A. Ferber, and Anne E. Winkler. 2001. *The Economics of Women, Men, and Work*. Englewood Cliffs, NJ: Prentice Hall.

———, Patricia Simpson, and Deborah Anderson. 1998. ''Continuing Progress? Trends in Occupational Segregation in the United States over the 1970s and 1980s.'' *Feminist Economics* 4(3): 29–71.

Browne, Irene. 1999. ''Latinas and African American Women in the U.S. Labor Market.'' In *Latinas and African American Women at Work. Race, Gender, and Economic Inequality*, edited by Irene Browne, pp. 408–31. New York: Russell Sage Foundation.

Carrington, William J., and Kenneth R. Troske. 1998. ''Interfirm Segregation and the Black/White Wage Gap.'' *Journal of Labor Economics* 16(2): 231–60.

Catanzarite, Lisa. 2000. ''Brown-Collar Jobs: Occupational Segregation and Earnings of Recent-Immigrant Hispanics.'' *Sociological Perspectives* 43: 45–75.

Chiswick, Barry R., and Paul W. Miller. 2009. ''Educational Mismatch: Are High-Skilled Immigrants Really Working at High-Skilled Jobs and the Price They Pay If They Aren't?'' IZA Discussion Paper No 4280. Bonn, Germany: IZA.

Cohen, Philip N., and Matt L. Huffman. 2003. ''Occupational Segregation and the Devaluation of Women's Work across U.S. Labor Markets.'' *Social Forces* 81(3): 881–908.

Cutler, David M., Edward L. Glaeser, and Jacob L. Vigdor. 2008. ''Is the Melting Pot Still Hot? Explaining the Resurgence of Immigrant Segregation.'' *Review of Economics and Statistics* 90(3): 478–97.

Del Río, Coral, and Olga Alonso-Villar. 2012. ''Occupational Segregation of Immigrant Women in Spain.'' To appear in *Feminist Economics* 18(2).

Duncan, Otis D., and Beverly Duncan. 1955. ''A Methodological Analysis of Segregation Indexes.'' *American Sociological Review* 20(2): 210–17.

———, and Stanley Lieberson. 1958. ''Ethnic Segregation and Assimilation.'' *American Journal of Sociology* 64(4): 364–74.

Farley, Reynolds, Howard Schuman, Suzanne Bianchi, Diane Colasanto, and Shirley Hatchett. 1978. ''Chocolate City, Vanilla Suburbs: Will the Trend toward Racially Separate Communities Continue?'' *Social Science Research* 7(4): 319–44.

Frankel, David M., and Oscar Volij. 2011. ''Measuring School Segregation.'' *Journal of Economic Theory* 146(1): 1–38.

Goldin, Claudia. 2002. ''A Pollution Theory of Discrimination: Male and Female Differences in Occupations and Earnings.'' NBER Working Paper 8985 Cambridge, MA: National Bureau of Economic Research.

———, and Cecilia Rouse. 2000. ''Orchestrating Impartiality: The Impact of ''Blind'' Auditions on Female Musicians.'' *American Economic Review* 90(4): 715–41.

Gradín, Carlos, Coral del Río, and Olga Alonso-Villar. 2011. ''Occupational Segregation by Race and Ethnicity in the US: Differences across States.'' ECINEQ Working Paper 2011-190. Palma de Mallorca, Spain: Society for the Study of Income Inequality.

Hansen, Gordon. 2006. ''Illegal Migration from Mexico to the United States.'' *Journal of Economic Literature* 44(4): 869–924.

Hellerstein, Judith K., Melissa McInerney, and David Neumark. 2009. ''Spatial Mismatch, Immigrant Networks, and Hispanic Employment in The United States.'' NBER Working Paper 15398. Cambridge, MA: National Bureau of Economic Research.

———, and David Neumark. 2008. ''Workplace Segregation in the United States: Race, Ethnicity, and Skill.'' *Review of Economics and Statistics* 90(3): 459–77.

Hirsch, Barry T., and David A. Macpherson. 2004. ''Wages, Sorting on Skill, and the Racial Composition of Jobs.'' *Journal of Labor Economics* 22(1): 189–210.

Huffman, Matt L., and Philip N. Cohen. 2004. ''Racial Wage Inequality: Job Segregation and Devaluation across U.S. Labor Markets.'' *American Journal of Sociology* 109(4): 902–36.

———, ———, and Jessica Pearlman. 2010. ''Engendering Change: Organizational Dynamics and Workplace Gender Desegregation, 1975–2005.'' *Administrative Science Quarterly* 55: 255–77.

Iceland, John. 2004. ''Beyond Black and White. Metropolitan Residential Segregation in Multi-Ethnic America.'' *Social Science Research* 33: 248–71.

James, David R., and Karl E. Taeuber. 1985. ''Measures of Segregation.'' *Sociological Methodology* 15: 1–32.

Joassart-Marcelli, Pascale. 2009. ''The Spatial Determinants of Wage Inequality: Evidence from Recent Latina Immigrants in Southern California.'' *Feminist Economics* 15(2): 33–72.

Kaufman, Robert L. 2002. ''Assessing Alternative Perspectives on Race and Sex Employment Segregation.'' *American Sociological Review* 67: 547–72.

———. 2010. *Race, Gender, and the Labor Market: Inequalities at Work.* Boulder, CO: Lynne Rienner Publishers.

Kim, Marlene. 2002. ''Has the Race Penalty for Black Women Disappeared in the United States?'' *Feminist Economics* 8(2): 115–24.

King, Mary C. 1992. ''Occupational Segregation by Race and Sex, 1940–88.'' *Monthly Labor Review* 115: 30–37.

———. 1999. ''Labour Market Segmentation.'' In *The Elgar Companion to Feminist Economics*, edited by Janice Peterson and Margaret Lewis, pp. 505–11. Cheltenham, UK: Edward Elgar Publishing.

Kmec, Julie A. 2003. ''Minority Job Concentration and Wages.'' *Social Problems* 50(1): 38–59.

Massey, Douglas S., and Nancy A. Denton. 1987. ''Trends in the Residential Segregation of Blacks, Hispanics, and Asians: 1970–1980.'' *American Sociological Review* 52(6): 802–25.

Maxwell, Nan L. 2010. ''English Language and Low-Skilled Jobs: The Structure of Employment.'' *Industrial Relations* 49(3): 457–65.

Mintz, Beth, and Daniel H. Krymkowski. 2005. ''Determinants of the Rate of Occupational Sex and Race Integration: 1980–2000.'' Paper presented at the Annual Meeting of the American Sociological Association, Philadelphia, PA.

Misra, Joya. 1999. ''Latinas and African American Women in the Labor Market: Implications for Policy.'' In *Latinas and African American Women at Work. Race, Gender, and Economic Inequality*, edited by Irene Browne, pp. 408–31. New York: Russell Sage Foundation.

Moir, Hazel, and Joy Selby Smith. 1979. ''Industrial Segregation in the Australian Labour Market.'' *Journal of Industrial Relations* 21: 281–91.

Neal, Derek A., and William R. Johnson. 1996. ''The Role of Premarket Factors in Black-White Wage Differences.'' *Journal of Political Economy* 104(5): 869–95.

Pager, Devah, and Diane Karafin. 2009. ''Bayesian Bigot? Statistical Discrimination, Stereotypes, and Employer Decision Making.'' *The Annals of the American Academy of Political and Social Science* 621: 70–93.

Pancs, Romans, and Nicolaas Vriend. 2007. ''Schelling's Spatial Proximity Model of Segregation Revisited.'' *Journal of Public Economics* 91: 1–24.

Patel, Krishna, and Francis Vella. 2007. ''Immigrant Networks and Their Implications for Occupational Choice and Wages.'' IZA Discussion Paper No. 3217. Bonn, Germany: IZA.

Queneau, Hervé. 2009. ''Trends in Occupational Segregation by Race and Ethnicity in the USA: Evidence from Detailed Data.'' *Applied Economics Letters* 16: 1347–50.

Rawlston, Valerie, and William E. Spriggs. 2002. ''A Logit Decomposition Analysis of Occupational Segregation: An Update for the 1990s of Spriggs and Williams.'' *Review of Black Political Economy* Spring: 91–96.

Reardon, Sean, and Glenn Firebaugh. 2002. ''Measures of Multigroup Segregation.'' *Sociological Methodology* 32: 33–76.

———, and John T. Yun. 2001. ''Suburban Racial Change and Suburban School Segregation, 1987–95.'' *Sociology of Education* 74: 79–101.

Reskin, Barbara. 1999. ''Occupational Segregation by Race and Ethnicity Among Women Workers.'' In *Latinas and African American Women at Work. Race, Gender, and Economic Inequality*, edited by Irene Browne, pp. 183–204. New York: Russell Sage Foundation.

———, Lowell Hargens, and Elizabeth Hirsh. 2004. ''Picturing Segregation: The Structure of Occupational Segregation by Sex, Race, Ethnicity, and Hispanicity.'' Unpublished paper, University of Washington.

Silber, Jacques. 1992. ''Occupational Segregation Indices in the Multidimensional Case: A Note.'' *The Economic Record* 68: 276–77.

Spriggs, William E., and Rhonda M. Williams. 1996. ''A Logit Decomposition Analysis of Occupational Segregation: Results for the 1970s and 1980s.'' *Review of Economics and Statistics* 78: 348–55.

Tomaskovic-Devey, Donald, Catherine Zimmer, Kevin Stainback, Corre Robinson, Tiffany Taylor, and Tricia McTague. 2006. ''Documenting Desegregation: Segregation in American Workplaces by Race, Ethnicity, and Sex, 1966–2003.'' *American Sociological Review* 71: 565–88.

Watts, Martin J. 1995. ''Trends in Occupational Segregation by Race and Gender in the U.S.A., 1983–92: A Multidimensional Approach.'' *Review of Radical Political Economics* 27(4): 1–36.

Appendix

FIGURE A1

SEGREGATION OF WORKERS ACCORDING TO THE ENGLISH PROFICIENCY LEVEL THEY REPORT

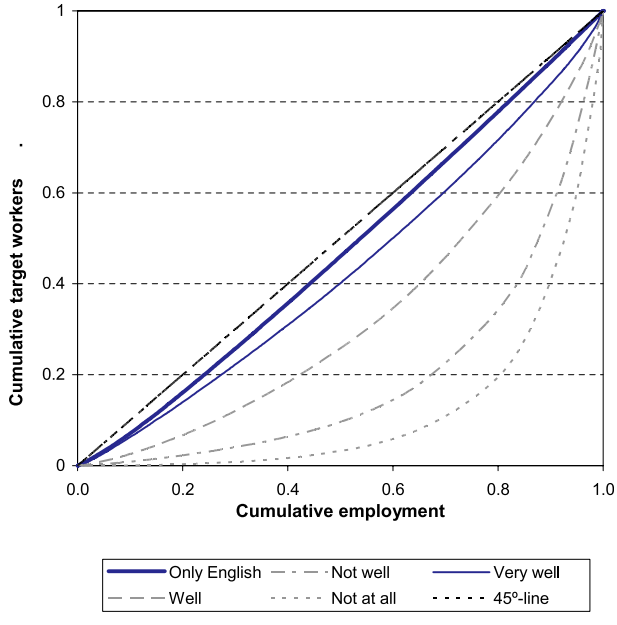


FIGURE A2

Segregation of Race/Ethnic Groups Who Report Speaking English Very Well or Not Well

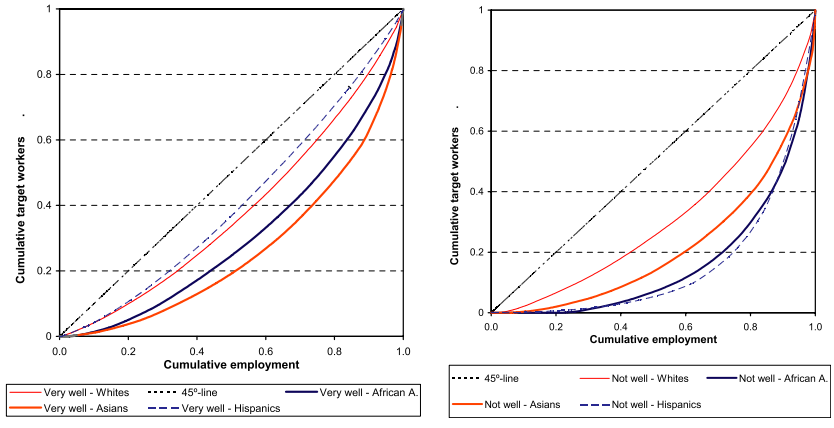


FIGURE A3

Segregation Curves for Workers According to Their Educational Levels

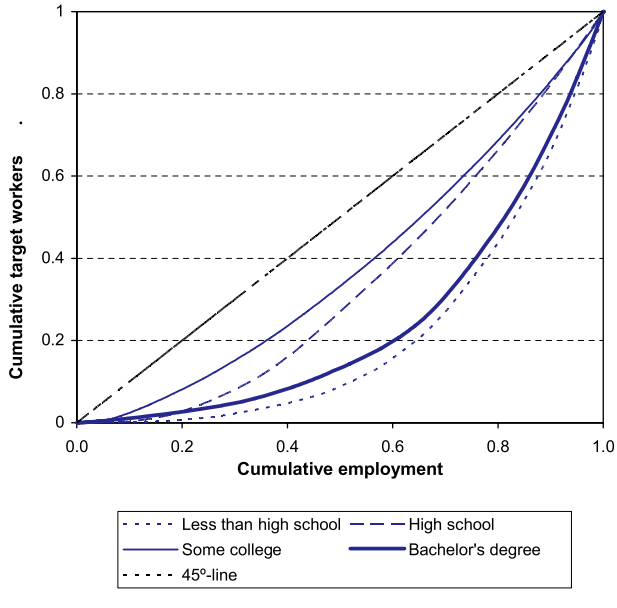
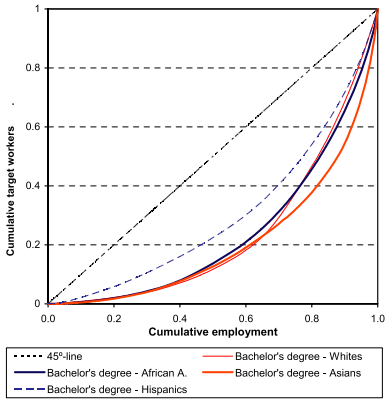


FIGURE A4

SEGREGATION CURVES OF THE LARGEST RACIAL/ETHNIC GROUPS BY EDUCATIONAL LEVEL



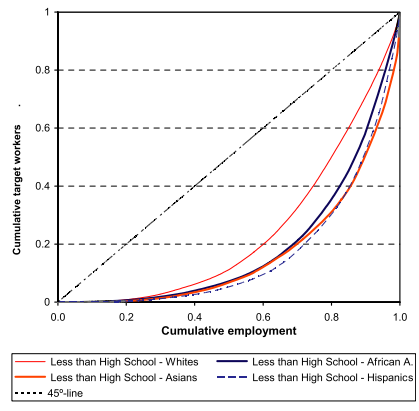


TABLE A1

Descriptive Statistics for Main Variables in Regressions: Average Values by Ethnicity/Race and Gender Across Local Markets (Standard Deviation in Parentheses)

Group	Segregation Φ_1^g	% High school diploma	% Some college or associate degree	% Bachelor degree or higher	% Speaking English not well/not at all	% Speaking English well	% Speaking English very well
2000 Census							
White males	0.133 (0.025)	29.5 (6.7)	32.1 (4.5)	26.5 (7.3)	3.2 (2.4)	0.6 (0.5)	0.4 (0.3)
White females	0.207 (0.046)	27.8 (6.3)	36.9 (4.6)	26.1 (6.8)	3.3 (2.1)	0.6 (0.4)	0.4 (0.3)
African-American males	0.217 (0.072)	33.8 (5.5)	32.3 (7.2)	14.0 (5.0)	4.4 (3.1)	1.3 (1.6)	0.7 (0.9)
African-American females	0.260 (0.057)	29.5 (5.3)	37.6 (5.9)	16.3 (4.7)	3.3 (2.4)	0.9 (1.1)	0.7 (0.8)
Asian males	0.273 (0.124)	14.6 (4.2)	22.7 (6.9)	48.9 (11.9)	43.6 (7.1)	23.4 (3.5)	12.0 (3.8)
Asian females	0.268 (0.058)	17.3 (3.9)	25.0 (5.5)	41.7 (9.8)	41.5 (5.9)	23.0 (2.6)	12.1 (3.6)
Native-American males	0.216 (0.053)	31.9 (5.7)	34.0 (4.6)	14.5 (4.7)	16.9 (12.1)	4.6 (3.2)	1.3 (0.9)
Native-American females	0.204 (0.043)	30.2 (4.4)	39.6 (4.6)	15.7 (3.7)	20.5 (15.2)	4.3 (3.5)	1.1 (0.8)
Hispanic males	0.367 (0.139)	24.8 (5.4)	21.3 (6.6)	10.1 (4.8)	36.2 (10.3)	16.0 (3.4)	25.2 (12.1)
Hispanic females	0.233 (0.056)	25.9 (4.3)	29.2 (5.7)	12.8 (4.6)	43.0 (10.1)	12.9 (3.6)	17.0 (8.5)
Males of other races	0.145 (0.048)	27.3 (4.7)	32.0 (5.4)	22.8 (6.1)	17.6 (7.1)	7.2 (4.0)	4.2 (2.9)
Females of other races	0.199 (0.036)	25.3 (5.0)	37.5 (4.7)	21.6 (5.3)	14.7 (6.3)	5.4 (3.3)	3.7 (2.9)
2005–2007 ACS							
White males	0.135 (0.029)	30.4 (6.6)	32.2 (4.3)	28.6 (7.6)	3.2 (2.5)	0.6 (0.5)	0.4 (0.3)
White females	0.213 (0.054)	27.0 (5.9)	36.6 (4.4)	29.8 (7.3)	3.1 (2.2)	0.6 (0.5)	0.3 (0.3)
African-American males	0.202 (0.060)	37.2 (5.8)	32.4 (5.9)	16.8 (5.0)	5.0 (4.3)	1.8 (2.7)	0.8 (1.4)
African-American females	0.267 (0.066)	31.8 (5.5)	37.8 (4.8)	19.1 (4.9)	3.8 (3.9)	1.4 (2.6)	0.9 (1.4)
Asian males	0.278 (0.115)	16.2 (5.1)	20.4 (7.5)	54.4 (12.9)	45.5 (6.7)	20.9 (3.2)	11.4 (3.1)
Asian females	0.267 (0.056)	17.4 (3.8)	23.0 (5.7)	48.4 (8.9)	43.5 (6.3)	20.9 (2.6)	12.4 (3.8)
Native-American males	0.237 (0.078)	34.5 (6.1)	35.4 (2.7)	17.9 (6.0)	23.1 (16.8)	3.8 (2.8)	1.3 (1.3)
Native-American females	0.251 (0.044)	32.0 (5.4)	39.3 (4.0)	17.2 (2.7)	24.1 (15.7)	4.1 (2.9)	0.9 (0.6)
Hispanic males	0.428 (0.180)	30.2 (4.4)	20.1 (6.0)	11.1 (4.5)	31.7 (9.4)	16.7 (4.5)	30.2 (11.5)
Hispanic females	0.247 (0.062)	29.6 (3.9)	28.8 (5.4)	15.1 (5.4)	40.7 (9.5)	12.5 (4.3)	20.0 (9.0)
Males of other races	0.134 (0.058)	26.8 (6.2)	34.4 (5.1)	27.1 (5.6)	13.9 (6.5)	4.5 (3.9)	4.1 (4.5)
Females of other races	0.219 (0.054)	22.5 (4.7)	37.8 (5.7)	30.1 (5.8)	13.6 (4.1)	3.8 (3.7)	3.1 (3.5)

TABLE A2

REGRESSIONS FOR SEGREGATION BY RACE/ETHNICITY AND GENDER ACROSS LOCAL MARKETS FOR SEVERAL LOCAL SEGREGATION INDEXES ($\Phi^g_{0.1}$, $\Phi^g_{0.5}$, Φ^g_2, D^g, AND G^g)

Dataset	2000 Census					2005–2007 ACS				
Index	$\Phi^g_{0.1}$	$\Phi^g_{0.5}$	Φ^g_2	D^g	G^g	$\Phi^g_{0.1}$	$\Phi^g_{0.5}$	Φ^g_2	D^g	G^g
Female	0.200***	0.128***	0.069***	0.054***	0.064***	0.226***	0.127***	0.056***	0.049***	0.060***
	(0.013)	(0.005)	(0.006)	(0.003)	(0.003)	(0.019)	(0.006)	(0.009)	(0.003)	(0.004)
African American	0.243***	0.105***	0.151***	0.056***	0.069***	0.229***	0.086***	0.118***	0.039***	0.055***
	(0.032)	(0.015)	(0.025)	(0.010)	(0.011)	(0.038)	(0.017)	(0.027)	(0.010)	(0.012)
Asian	0.09	0.018	0.042	0.018	0.021	−0.075	−0.051	−0.084	−0.026	−0.025
	(0.121)	(0.049)	(0.065)	(0.028)	(0.037)	(0.125)	(0.044)	(0.066)	(0.023)	(0.030)
Native American	0.365***	0.141***	0.181***	0.069***	0.095***	0.373***	0.155***	0.173***	0.066**	0.096***
	(0.056)	(0.023)	(0.033)	(0.013)	(0.015)	(0.083)	(0.040)	(0.050)	(0.026)	(0.03)
Hispanic	0.188*	0.050	0.032	0.038*	0.036	0.066	0.043	0.000	0.035	0.037
	(0.103)	(0.038)	(0.058)	(0.022)	(0.025)	(0.132)	(0.046)	(0.075)	(0.023)	(0.027)
Other races	0.189***	0.028	0.006	0.004	0.006	0.219***	0.027	0.004	−0.009	−0.003
	(0.046)	(0.019)	(0.024)	(0.011)	(0.014)	(0.046)	(0.018)	(0.027)	(0.011)	(0.014)
African	0.089***	−0.030***	−0.021	−0.049***	−0.030***	0.124***	−0.009	0.002	−0.033***	−0.015*
American × female	(0.028)	(0.009)	(0.013)	(0.006)	(0.007)	(0.040)	(0.012)	(0.017)	(0.008)	(0.009)
Asian × female	0.137***	−0.052**	−0.137***	−0.060***	−0.055***	0.149**	−0.056**	−0.170***	−0.058***	−0.059***
	(0.052)	(0.02)	(0.03)	(0.011)	(0.013)	(0.075)	(0.025)	(0.038)	(0.012)	(0.015)
Native	−0.006	−0.092***	−0.126***	−0.072***	−0.077***	−0.077	−0.071	−0.071	−0.039	−0.044
American × female	(0.072)	(0.022)	(0.026)	(0.014)	(0.015)	(0.079)	(0.048)	(0.054)	(0.027)	(0.034)
Hispanic × female	−0.087**	−0.139***	−0.199***	−0.106***	−0.100***	−0.090*	−0.147***	−0.183***	−0.107***	−0.103***
	(0.036)	(0.013)	(0.022)	(0.007)	(0.008)	(0.054)	(0.020)	(0.027)	(0.010)	(0.012)
Other races × female	0.045	−0.018	−0.005	−0.022**	−0.014	0.095	0.020	0.019	0.014	0.018
	(0.050)	(0.015)	(0.014)	(0.010)	(0.011)	(0.064)	(0.025)	(0.024)	(0.016)	(0.018)
% Speaking English very well	0.000	0.000	0.003*	0.000	0.000	0.000	−0.001	−0.001	0.000	0.000
	(0.002)	(0.001)	(0.001)	(0.000)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)

TABLE A2

(Cont.)

Dataset	2000 Census					2005–2007 ACS				
Index	$\Phi^g_{0.1}$	$\Phi^g_{0.5}$	Φ^g_2	D^g	G^g	$\Phi^g_{0.1}$	$\Phi^g_{0.5}$	Φ^g_2	D^g	G^g
% Speaking English well	−0.005	−0.001	−0.006	0.000	0.000	0.004	0.006***	0.011***	0.003***	0.004***
	(0.007)	(0.003)	(0.004)	(0.001)	(0.002)	(0.006)	(0.002)	(0.004)	(0.001)	(0.001)
% Speaking English not well/not at all	0.008*	0.005***	0.012***	0.002***	0.003***	0.008	0.005**	0.010***	0.002**	0.003***
	(0.004)	(0.002)	(0.003)	(0.001)	(0.001)	(0.005)	(0.002)	(0.004)	(0.001)	(0.001)
% High school	−0.007*	−0.003*	−0.003	−0.001	−0.001	−0.006	−0.002	−0.001	0.000	0.000
	(0.004)	(0.002)	(0.002)	(0.001)	(0.001)	(0.005)	(0.002)	(0.003)	(0.001)	(0.001)
% Some college or associate degree	−0.010***	−0.005***	−0.006***	−0.003***	−0.004***	−0.011**	−0.004**	−0.003	−0.002***	−0.003**
	(0.003)	(0.001)	(0.002)	(0.001)	(0.001)	(0.004)	(0.002)	(0.003)	(0.001)	(0.001)
% Bachelor or higher	0.003	0.000	0.002	−0.001	0.000	0.002	0.000	0.001	−0.001	0.000
	(0.003)	(0.001)	(0.002)	(0.001)	(0.001)	(0.004)	(0.002)	(0.003)	(0.001)	(0.001)
MA fixed effects	x	x	x	x	x	x	x	x	x	x
Intercept	0.574**	0.374***	0.327**	0.388***	0.456***	0.599	0.301*	0.218	0.313***	0.357***
	(0.249)	(0.093)	(0.136)	(0.056)	(0.063)	(0.365)	(0.155)	(0.264)	(0.079)	(0.093)
No. of observations	1,181	1,181	1,181	1,181	1,181	1,037	1,037	1,037	1,037	1,037
R^2	0.617	0.735	0.694	0.704	0.717	0.596	0.720	0.683	0.736	0.727
Psudo-R^2	0.495	0.650	0.597	0.610	0.627	0.443	0.613	0.562	0.635	0.623

NOTE: Robust standard errors are shown in parentheses.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.