Black Population Concentration and Black-White Inequality: Expanding the Consideration of Place and Space Effects*

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Abstract

For over 40 years, sociologists have investigated the relationship between the concentration of black population in a geographic area and the relative economic standing of blacks in that area. These tests of what has come to be called the "visibility-discrimination hypothesis" have established that concentration of black population in an area is positively related to black-white inequality in that area. In this article, we extend the consideration of the place effects and consider space effects by (1) tapping effects of normative structures in the spatial context of a local area on black-white inequality in the local area, (2) measuring the effects of the concentration of black population in adjacent areas on black-white inequality in the focal area, (3) controlling for spatial dependence in inequality when examining these processes, and (4) examining the effects of these place and space factors on both occupational and wage inequality, so that their effects can be compared between the two outcomes and effects on wage inequality can be assessed net of occupation effects. After testing our model with data on local labor market areas, we conclude by examining the implications of our analysis for future studies of the visibility-discrimination hypothesis and for the general use of models that examine the effects of local place.

For over 40 years, sociologists have investigated the relationship between the concentration of black population in a geographic area and the relative economic standing of blacks in that area. The roots of this tradition lie in Blalock's (1956) formulation of the "visibility-discrimination" hypothesis: the contention that where

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the size of the minority population in a geographic area is large, the white population in that area will discriminate against the minority group. This discrimination, which is said to stem from whites' perception that minority concentration threatens whites' social or economic well-being (Blalock 1956; Burr, Galle & Fossett 1991), is argued to increase inequality between the two groups.

Empirical studies have clarified the relationship between minority population concentration and minority-majority group inequality (Parcel 1979; Jiobu & Marshall 1971; Burr, Galle, & Fossett 1991; Frisbie & Neidert 1977). In this article, we extend the consideration of place effects and consider space effects by (1) tapping the effects of normative structures in the spatial context of a local area on black-white inequality in the local area, (2) measuring the effects of the concentration of black population in adjacent areas on black-white inequality in the focal area, (3) controlling for spatial dependence in inequality when examining these processes, and (4) examining the effects of these place and space factors on both occupational and wage inequality, so that their effects can be compared between the two outcomes and effects on wage inequality can be assessed net of occupation effects.

Through these expansions of previous tests of the visibility-discrimination hypothesis, our study has implications not only for understanding the effects of black population concentration on black-white inequality but also for the theoretical specification of models that use geographic areas, either as focal units or as contexts for individual action, in the investigation of a wide range of substantive topics. As Land & Deane's (1992) development of models for the estimatation of spatial effects for dependent variables shows, sociologists are aware of the importance of the spatial context in which places are embedded (see also Doreian 1980, 1981; Land, Deane, & Blau 1991; Lieberson 1985). We extend their work, and thus the consideration of the effects of the contexts in which places are embedded, by examining the spatial context of both explanatory and outcome variables.

The Visibility-Discrimination Hypothesis

In his formulation of the visibility-discrimination hypothesis, Blalock (1956:584) argue that there exists "a positive relationship between the percentage of the minority or its rate of increase [in a geographic area] and one or more of the following: (a) prejudice (attitude), (b) intergroup conflict (including overt behavior), (c) discrimination (resultant of overt behavior), and (d) rate of assimilation of the minority" (see also Burr, Galle, & Fossett 1991; Glenn 1966; Blalock 1957; see Tigges & Tootle 1993 for a review of the various forms that this proposition has taken).

This thesis has been touted as "far and away the most well-developed hypothesis linking structural characteristics of local labor markets to racial inequality" (Burr, Galle & Fossett 1991:833). By focusing on the relationship between the demographic structure of an area and its level of black-white inequality, the visibility-discrimination hypothesis not only provides a structural explanation for inequality but also highlights the role that the characteristics of local place play in its determination. Thus, whereas many areas of stratification research have only recently begun to examine how characteristics of local place affect stratified outcomes (see Beggs 1995; Villemez & Beggs 1995; Parcel 1979; Beck & Colclough 1988), researchers in this tradition have been doing so for four decades.

Tests of the visibility-discrimination hypothesis that use income as the dependent variable have provided considerable empirical support for this thesis at the aggregate level. For example, Parcel (1979) found that black population concentration in a labor market had a positive effect on the earnings of white men and a negative effect on the earnings of black men in that labor market. Similarly, Jiobu and Marshall (1971) found a positive effect of percent black on black-white income differentiation and Frisbie and Neidert (1977) found positive effects of the size of Mexican American and black minority populations on minority-white income differentials.

When the range of dependent variables is expanded to include such outcomes as occupational and employment status, the findings are less consistent (Tienda & Lii 1987; see also Blalock 1957; Brown & Fuguitt 1972). Burr, Galle & Fossett (1991) found a positive relationship between black population concentration and occupational inequality in 51 southern SMSAs, and Semyonov, Hoyt & Scott (1984:268) documented that "the effect of black proportion in the labor force on race-linked differentiation is substantial and most pronounced at the upper and lower ends of the occupational hierarchy." But Melendez & Figueroa (1992) found no effect of percent nonwhite in an SMSA on the labor force participation rates of Puerto Rican, white, or black women — they found only a negative effect of the percent of recent migrants on the labor force participation of black women. Farkas, Barton & Kushner (1988) found positive effects of black and Hispanic population concentration for young white men but their results also revealed that young white women enjoyed neither higher earnings nor better employment opportunities in labor markets with higher concentrations of Hispanics and blacks.

Other studies have focused on the form of the relationship between minority population concentration and minority-majority group inequality. These studies draw on Blalock's (1957, 1967) contention that the relationship should be curvilinear: "As the gap between the groups increases, majority group members perceive less need for additional discriminatory practices; the relationship between minority group size and racial disparity in outcomes is hypothesized as positive but with a decreasing slope" (Tigges & Tootle 1993:281; from Blalock 1967; see also Semyonov 1988). The "overflow" hypothesis (Frisbie & Neidert 1977; Glenn 1964; Semyonov, Hoyt & Scott 1984) modifies Blalock's argument by contending that high levels of minority population concentration can actually have positive effects on minority-majority inequality. It has also received some empirical support (see Semyonov 1988). For example, McCreary, England & Farkas (1989) demonstrate a nonlinear effect of black population concentration in a city on employment of black and white youths: Higher black population concentration had a negative effect on black employment until blacks represented 40-50% of the population, at which point their odds of employment increased (see also Bloomquist 1992).

Explorations of the Link between Visibility and Threat

Formulations of the visibility-discrimination hypothesis (Blalock 1956, 1967) generally identify perceived threat as a key mechanism underlying the relationship between the concentration of minority population and minority-majority group inequality (Allport 1954; Wilcox & Roof 1978; Williams 1947).[1] As Burr, Galle & Fossett (1991:833) put it, "The motivation of the majority to discriminate against the minority is a function of the threat (either political or economic) that the minority is perceived to pose to the majority. The perception of minority threat is viewed as a positive function of the relative size of the minority population."

Because studies of the relationship between black population concentration and black-white inequality generally have not tapped whites' perceived threat from blacks (see Quillian 1995), this thesis has not been tested fully. However, Fossett & Kiecolt (1989) established (using individual-level data) that black population concentration (percent black) in an area had a positive effect on whites' perceptions of threat from blacks and that perceived threat had a negative effect on whites' support for racial integration. They also found a direct, negative effect (net of threat) of percent black on whites' support for integration. Using group size as a measure of perceived threat, Quillian (1995:606) provided further support for the effect of minority population concentration on racial attitudes of the majority group by showing that "the relative size of the subordinate group and the economic situation of the particular country can strongly influence the degree of prejudice expressed by dominant group members." Cohn & Fossett (1995) tested the second part of the threat hypothesis — the relationship between perceived threat and inequality — by using a measure of white racial tolerance to tap the effect of whites' perceived threat from blacks (at the aggregate level) on black-white employment inequality. However, they found no significant effect of threat on inequality.

Modeling the Effects of Visibility and Threat: Expanding the Range of Place and Space Factors

Consistent with past studies (Blalock 1967; Cohn & Fossett 1995), we expect that, as the concentration of black population in a geographic area (LMA) increases, the relative economic standing of blacks (vis-à-vis whites) will decline. Thus:

Hypothesis 1. Black-white inequality in both of the economic outcomes that we examine (occupational and wage inequality) will increase, for both women and men, as black population concentration increases.

In addition to examining these effects, we build on one of the key contributions of the literature on the visibility-discrimination hypothesis — its ability to link characteristics of local place to racial inequality — by expanding the consideration of characteristics of place, and of their variation across space, in four ways. First, we expand the range of local place characteristics. We provide a more complete test of the visibility-discrimination hypothesis than has been offered previously: We do so by examining the effects of both black population concentration and an indirect measure of the perceived threat in the spatial context in which a local area is embedded on black-white inequality. In doing so, we draw not only from Blalock's (1956, 1957) theoretical specification of the role of threat in the visibility-discrimination hypothesis but also from Wilcox and Roof's (1978:422) argument that "traditional racial stereotypes and norms intensify fears and threats, so that black visibility often provokes discriminatory responses."

We tap these racial stereotypes and norms by including in our models a measure of the local institutional environment in which an LMA is embedded, which is composed of shared understandings and expectations of appropriate behavior. More specifically, our institutional environment measure taps the degree to which norms of equality of opportunity are found in the spatial context of a local area. This direct indicator of normative structures is superior to such proxy measures as region (Fossett & Kiecolt 1989:823; Jones & Rosenfeld 1989) which have sometimes been used to tap normative effects on inequality.

Given Wilcox and Roof's (1978) point regarding the relationship between racial stereotypes and norms and perceived threat and the results of Fossett & Kiecolt (1989), we expect norms supporting equal opportunity to be less evident in areas with higher levels of perceived threat. Thus, because perceived threat is postulated to be related positively to inequality, the level of support for equality of opportunity in the local institutional environment should be related positively to the level of black-white equality in that area. Therefore:

Hypothesis 2: Black women and men should enjoy better economic outcomes, relative to whites, in areas whose institutional environments evidence greater support for equal opportunity.

Our second and third expansions add a spatial dimension to studies of the visibility-discrimination hypothesis. Previous examinations of the effects of black population concentration on black-white inequality used inadequately specified models that omitted an important spatial factor: the effect of levels of black population concentration in geographic areas surrounding the focal geographic area. Thus, they failed to consider that the effects of black population concentration may transcend areal boundaries. Lieberson (1985:60-61) describes this as the "error of contamination," which "occurs when the influence of an independent variable is not restricted exclusively to those settings where the variable is found. . . . To the degree that there is information or some other impact crossing between the settings in which X varies. . . the linkage between X and Y is altered along the entire range of X." Doreian (1980) noted that this type of error could serve as one source of spatial effects. We test for the presence of this error by examining the effects of black population concentration not only in the focal geographic area but also in adjacent areas. Thus, we consider the nature of the spatial context in which a local area is embedded. Other things being equal, we expect focal areas that are embedded in environments (surrounding areas) with higher levels of black population concentration to have higher levels of perceived threat. Thus:

Hypothesis 3: The greater the concentration of black population in adjacent geographic areas (LMAs), the poorer economic outcomes will be for black women and men, relative to white women and men, resulting in greater black-white inequality in occupation and wages in the focal area.

With our third expansion, we extend further the consideration of spatial effects by drawing on the work of Lieberson (1985), Doreian (1980, 1981), and Land and Deane (1992) to control for spatial dependence effects when examining the effects of black population concentration in the focal area, the local institutional environment, and black population concentration in adjacent areas on black-white economic inequality. These spatial effects could be caused by a diffusion effect: The level of the dependent variable in one geographic area could affect directly the level of the dependent variable in another geographic area. To control for these effects, the Land-Deane technique uses a measure of the spatial distribution of the dependent variable.

A product of spatial arrangements, spatial autocorrelation can be traced to the relationship between two sets of similarities: similarity in attribute level and similarity in spatial location (Goodchild 1986:6). Doreian (1980, 1981) identifies two types of models for explaining spatial autocorrelation: the spatial effects model and the spatial disturbance model. Goodchild (1986) describes these models as due to

> arrangement across spatial objects either because neighboring objects influence each other directly, so that the value at one place is caused directly by values at neighboring places (autocorrelation), or because the value at each place is determined by some other variable at the same place which is itself autocorrelated . . . Cliff and Ord (1981:141) refer to the two interpretations as interactive and reactive respectively. (42)

Spatial autocorrelation may also be due to the presence of both reactive and interactive processes. The method Goodchild describes for disentangling them is to first rule out any reactive processes. Then, if spatial autocorrelation remains, it may be attributed to an interactive process. But he notes that "we can in general resolve the ambiguity between interaction and reaction only in those cases where perfect models can be obtained" (Goodchild 1986:42).

Because our first consideration of spatial effects (the inclusion of the level of black population concentration in adjacent geographic areas) taps the distribution across space of an independent variable, it measures a reactive effect. Our second consideration of spatial effects taps an interactive effect by considering how levels of the dependent variable (inequality) may be related across space (geographic areas). Land and Deane (1992) suggest that diffusion is one mechanism by which this effect occurs. For example, if one area has very high levels of hourly wages, this fact may affect the wage levels in adjacent areas. (This follows from neoclassical economic theory: Because competition will draw workers into high-wage areas, there must be some equilibrium across adjacent areas.) Given this fact, there should be "clustering" in the distribution of the dependent variable, such as clusters of high- and low-wage areas. In our model, we evaluate the effect of the relative occupation and wage positions of blacks in other areas on their relative positions in a focal area. In effect, we test the proposition that net of other place attributes and reactive influences, the relative position of blacks in a focal area is affected directly by their relative positions in other areas with similar spatial location.

Our fourth expansion is to examine both occupational (Burr, Galle & Fossett 1991; Fossett, Galle & Kelly 1986) and wage inequality (Blalock 1967; Bloomquist 1992; Parcel 1979). Doing so not only allows us to compare the effects of place and space factors on these two types of inequality but also permits us to assess the effects of place and space factors on wage inequality, net of the effects of occupational inequality. Like Grant & Parcel (1990), Farkas, Barton & Kushner (1988), and Bloomquist (1992), we estimate our models separately for men and women, so that we can also assess whether and how the determination of these outcomes differs by gender.

UNIT OF ANALYSIS: THE LOCAL LABOR MARKET

Because the visibility-discrimination hypothesis pertains most directly to local areas, we take the local labor market area as the unit of analysis. In their examination of national data on earnings inequality, England et al. (1994:84) suggest that this is a local, rather than a national issue. They speculate that the "devaluation of occupations from a high black population concentration is masked in . . . national data but that this devaluation does occur in some *local* [emphasis original] labor markets where there is a sufficient number of blacks that some jobs are predominantly black."

Two other examinations of the visibility-discrimination hypothesis (Bloomquist 1992; Tigges & Tootle 1993) used local labor markets, as defined by Tolbert & Killian (1987; see also Killian & Tolbert 1993), as the unit of analysis. Although both the local labor market definitions and MSA definitions are based on commuting flows among counties, the local labor market definition is preferable to MSAs because it is not based on a central place model. These local labor market areas do not have to contain an urban center and, unlike MSAs, they cover the entire geography of the U.S. Thus, using them allows us to include both metropolitan and nonmetropolitan areas in our analysis. The local labor market definitions we use are the most recent ones produced by Tolbert & Sizer (1997), based on 1990 journey-to-work data.

Data, Measures, Methods

DATA

Data for this study come from four sources. The primary source is the 1990 Public Use Microdata Sample for Labor Market Areas (PUMS-L) (Tolbert, Beggs & Boudreaux 1995). These data, which are based on a special tabulation done by the U.S. Bureau of the Census for geographic areas defined by Tolbert and Sizer (1997), represent an approximately .45% sample of the U.S. population in 1990. We selected from this file records of individuals who (1) were over age 16, (2) were in the noninstitutionalized civilian labor force, and (3) reported their race as either white or black. We then aggregated these individual-level records to the labor market area (LMA) level. Our second data source is Census Summary Tape Files STF3C and STF4B (U.S. Bureau of the Census 1992a and 1992b), from which we drew county-level data. The Regional Economic Information System (REIS) files (U.S. Bureau of Economic Analysis 1994), which provide county-level, time-series data on employment and earnings, serve as our third data source. We use information from the 1980-90 period. Finally, we incorporate data from the Equal Employment Opportunity File from the 1990 census (U.S. Bureau of the Census 1992c). This file provides detailed occupational information at the county level, reported separately by race and gender. To construct our measures, we aggregated all county-level data to the LMA level. Analyzing the effects of black population concentration in LMAs requires that we select only those LMAs that contain sufficient numbers of blacks to make the analyses feasible. We developed a selection criterion based upon our assessment of the minimum number of cases needed in an LMA to derive stable estimates of our measures: We include in our analysis all LMAs in the PUMS-L file that have at least 30 (individual) records for black females and 30 for black males. This criterion resulted in the selection of 155 LMAs for our analysis.[2]

MEASURES, DEPENDENT VARIABLES

Because we examine the effects of black population concentration separately for women and men, each dependent variable compares black men to white men and black women to white women (Grant & Parcel 1990). Higher scores on each measure represent a better economic position for blacks.

Occupational Inequality

The initial data for our measures of occupational inequality came from the EEO files (U.S. Bureau of the Census 1992c). We assigned 1990 Nam-Powers-Terrie occupational status scores (Terrie & Nam 1994),[3] then aggregated these county-level files to the LMA level. By grouping occupations with the same Nam-Powers-Terrie scores, we arrived at approximately 100 occupational categories. We then constructed two measures from these distributions. The first is the net difference measure, developed by Lieberson (1976) and used by both Burr, Galle & Fossett (1991) and Fossett, Galle & Kelly (1986) (see also Coulter 1989). This measure, which interprets the differences in the ranks of individuals across groups, ranges from -100 to +100. A score of 0 indicates no inequality between two groups; a score of +100 indicates that all members of group A are in a higher position (have a higher rank) than all members of group B. We also include a second measure, the average relative advantage (ARA), which was developed by Fossett & South (1983) (see also Coulter 1989). The ARA is defined as the distance between two ranks, divided by the higher of the two (see Beggs 1995; Coulter 1989; Fossett & South 1983). This measure also ranges from -100 to +100; a score of 0 indicates no inequality between two groups and a score of -50 indicates that group B members, on average, have a 50% earnings advantage over group A members. We include both measures because each makes a unique contribution to the analysis. If analyses using each measure support our hypotheses, we gain enhanced confidence in the findings.

Wage Inequality

The data for our measures of wage inequality came from the PUMS-L, 1990 (Tolbert, Beggs & Boudreaux 1995). We used these data to construct analogs of the two measures used to tap occupational inequality (net difference and average relative advantage). We based these measures on an hourly wage distribution, which was constructed by dividing an individual's 1989 wage and salary income by the total number of hours he or she worked and taking the natural log of that quotient.[4]

MEASURES, INDEPENDENT VARIABLES

Black Population Concentration, Focal Geographic Area.

To measure black population concentration in a focal geographic area (LMA), we use data from the STF3C file of the 1990 census to calculate the proportion of the population in an LMA that is black. Consistent with research on the form of the relationship between black population concentration and inequality (Blalock 1967;

McCreary, England & Farkas 1989; Semyonov 1988), we use the log transformation of this measure.

Black Population Concentration, Adjacent Geographic Area

Our measure of black population concentration in the areas adjacent to each focal geographic area were constructed with data from the STF3C. For each LMA, we calculated a weighted average of the percent black in all adjacent LMAs and took the natural log of that average.[5] Thus, this measure taps the level of black population concentration of the spatial context in which a focal geographic area is embedded.

The Local Institutional Environment

We use a measure of the local institutional environment that was developed by Beggs (1995) from a large number of indicators that tap support for equality of opportunity. Using factor analysis, he reduced these indicators to five factor scales, representing: (1) state actions on fair employment practice (FEP) laws and civil rights issues; (2) votes of Congressional Representatives on equal opportunity issues (e.g., on busing); (3) individual orientations (liberal vs. conservative) of state residents (e.g., a ratio of subscription rates to New Republic vs. National Review); (4) state actions on passage of the Equal Rights Amendment; and (5) voting patterns within the state concerning the election of women to office. A state's score for this local institutional environment scale is the average of its scores on these five factor scales.[6]

To tap the effects of the local institutional environment on economic inequality, we created a score for each LMA that indicates the normative institutional environment in which that LMA is embedded. We derived this score by assigning, for each county in an LMA, the score of the state in which that county is located, then calculating a population-weighted average of the scores of the counties contained in each LMA.[7]

MEASURES, CONTROL VARIABLES

Spatial Effects Term

To tap interactive spatial effects, we used methods developed by Land and Deane (1992). The spatial effects score for each focal geographic area represents the sum, across all other LMAs, of the level of the dependent variable in each other LMA, divided by the distance between the focal LMA and each other LMA.[8] To calculate this score we multiplied, for each dependent variable, a vector of dependent variable score-by-LMA and a matrix of LMA-to-LMA distance weights. This procedure yielded a matrix of LMA-by-spatial effect scores, which we then linked to our LMA records. From this, we created an instrumental variable to use in our final analysis. This instrumental variable represents the predicted values from an equation in which the spatial effect terms were regressed on the other independent variables in the analysis (see below), dummy variables representing eight of the nine census divisions in the U.S. (the ninth serves as the reference category), and the log of the population of the focal area (see Land & Deane 1992 for more information on this procedure).

Other Controls

To control for effects of human capital in an area (see Tigges & Tootle 1993), we include measures of inequality in education (years of schooling completed) and experience (age - education - six years) in each LMA. To create these measures, we constructed two distributional measures that correspond to our two measures of occupational and wage inequality (net difference and average relative advantage). All the data used to construct these measures came from PUMS-L (Tolbert, Beggs & Boudreaux 1995).

We also include measures of the labor demand, economic growth, and traditional industrial mix in each LMA (Cohn & Fossett 1995).[9] Using data from the PUMS-L, we measure labor demand by the percent of people 16 and older who are employed in a local labor market. Economic growth is measured by the average annual growth in wage and salary employees, 1980-90, in a local labor market. These data come from the REIS file. The measure of traditional industrial mix, which was constructed with data from STF4B using procedures developed by Cohn & Fossett (1995:524), taps the expected "black representation in the labor force," given an area's industrial mix.

We include two measures of industrial sector location. The first indicates the percent of the local labor force employed in core services (Tigges 1987). The second is the percent of the local labor force employed in peripheral transformative industries (Tigges 1987). Tigges & Tootle (1993) include an index of dissimilarity in their analysis to control for competition (between black and white males) in an LMA. We also include an index of dissimilarity, but our index taps industrial, rather than occupational dissimilarity.[10] Data used to construct this measure come from STF4B. Descriptive statistics on all measures are reported in the Appendix.

METHODS

We begin our analysis by following procedures outlined by Land & Deane (1992) to perform a first-stage ordinary least squares regression which creates instrumental variables for our spatial effect terms. (We also repeated our analyses, using alternative techniques developed by Anselin [1988; see also Tolnay, Deane & Beck 1996]: this method produced virtually identical results.) These instrumental variables are then included in our second-stage analysis, which has two steps. In the first step, we initially assess the effects of our independent variables and our spatial effects control (the instrumental variable created in the first stage) on black-white inequality. To do so, we regress our measures of inequality (in occupation and wage) on (1) our measure of black population concentration in the focal area, (2) our measure of black population concentration in adjacent areas, (3) our institutional environment measure, and (4) the spatial dependence control. These variables are entered into the models in the specified order so that we can assess changes in the effects of black population concentration on inequality as the other variables are entered into the models. In the second step, we add our other controls to these models.

Results

SPACE AND PLACE EFFECTS, INITIAL ANALYSIS

Panel A of Table 1 presents the results of our initial analysis for men and panel B presents comparable results for women, for both dependent variables. The first line (model A) shows the zero-order effects of black population concentration in the focal geographic area on black-white inequality. In every instance, this effect is significant and in the predicted direction, for both men and women: Economic outcomes for black men and women, relative to white men and women, are poorer in areas with higher levels of black population concentration. In the equations described in the second line of each panel (model B), we add the effect of black population concentration in adjacent areas. The results show that the level of black population concentration in adjacent areas has a significant effect on black-white inequality (in the focal area) in six of the eight equations. As the level of black population concentration in adjacent areas increases, economic outcomes for black women and men, relative to white women and men, decline.

In every equation, the effect of black population concentration in the focal geographic area is reduced substantially when the measure of the level of black population concentration in adjacent areas is added to the model, but the effect of black population concentration in the focal geographic area remains significant. This pattern of results supports Lieberson's (1985) argument for avoiding the "error of contamination" by considering the effects of adjacent as well as focal geographic areas: It suggests that, at least for women, the spatial context in which a focal area is embedded (e.g., the level of black population concentration in adjacent areas) is more consequential for black-white economic inequality than the level of black population concentration in the focal area is. In terms of the visibility-discrimination hypothesis, for women, threat is a function of the levels of black population concentration in both the focal LMA and adjacent LMAs. It appears, though, that economic inequality between black and white men depends more upon black population concentration in the focal area than upon black population concentration in adjacent areas. For them, threat evolving from minority

TABLE 1: Spatial, Locality, and Institutional Environmental Effects on Inequality

		Independent Variables						
Dependent Variables		Percent Black Focal	Percent Black Contiguous	Institutional Environment	Spatial Effects	Inter-cept	R^2	N
				Panel A: Men				
Occupation								
Net Difference	A	-7.680**				-13.499	.534	155
	B	-5.743**	-2.522**			-11.905	.562	155
	C	-5.684**	-.249	.329**		-26.054	.616	155
	D	-5.091**	1.486	-.231	2.024**	-37.965	.655	155
	E	-5.091**	-.662	.330**	2.024**	-25.912	.655	155
Average Relative Advantage	A	-4.465**				-8.943	.463	155
	B	-3.613**	-1.109*			-8.242	.477	155
	C	-3.565**	.745	.269**		-19.780	.569	155
	D	-3.204**	1.607	-.127	2.302**	27.151	.611	155
	E	-3.204**	.493	.269**	2.302**	-20.112	.611	155
Log Hourly Wage								
Net Difference	A	-1.979**				-53.730	.070	155
	B	-1.772*	-.271			-53.559	.070	155
	C	-1.797*	-1.232	-.139		-47.575	.090	155
	D	-1.833*	-1.718	-.112	-.326	-63.894	.093	155
	E	-1.833**	-1.207	-.139	-.326	-47.542	.093	155
Average Relative Advantage	A	-2.055**				-28.694	.105	155
	B	-1.801*	-.331			-28.485	.106	155
	C	-1.799*	-.281	-.007		-28.793	.106	155
	D	-1.848*	-.939	.068	-.811	-53.121	.115	155
	E	-1.848*	-.247	.007	-.811	-28.748	.115	155
				Panel B: Women				
Occupation								
Net Difference	A	-9.430**				-1.820	.439	155
	B	-3.319**	-7.957**			3.206	.594	155
	C	-3.236**	-4.762**	.463**		-16.675	.653	155
	D	-2.867**	-2.865*	-.334	2.552**	52.952	.687	155
	E	-2.867**	-5.018**	.463**	2.552**	-17.015	.687	155
Average Relative Advantage	A	-7.095**				0.722	.448	155
	B	-2.478**	-6.012**			4.520	.608	155
	C	-2.405**	-3.201**	.407**		-12.974	.689	155
	D	-2.190**	-2.083**	-.168	2.438**	33.850	.717	155
	E	-2.190**	-3.350**	.407**	2.438**	-13.171	.717	155
Log Hourly Wage								
Net difference	A	-3.064**				-43.130	.164	155
	B	-1.507+	-2.028*			-41.849	.199	155
	C	-1.507+	-2.016*	.002		-41.926	.199	155
	D	-1.555+	-2.356*	.041	-.253	-53.019	.201	155
	E	-1.554+	-1.983*	.002	-.253	-41.883	.201	155
Average Relative Advantage	A	-2.983**				-21.326	.236	155
	B	-1.168+	-2.364**			-19.833	.309	155
	C	-1.151+	-1.741*	.090		-23.706	.321	155
	D	-1.263*	-2.123**	.162+	-.596	-39.283	.326	155
	E	-1.263*	-1.664*	.090	-.596	-23.604	.326	155

+ $p < .05$ (one tailed) * $p < .05$ (two-tailed) ** $p < .01$

concentration appears to be determined more in the area in which they live than in adjacent areas.

In the third set of equations (model C), we add our institutional environment measure. For both men and women, this measure has a significant, direct effect on inequality in the equations predicting occupational inequality. Note that for women, the effect of the level of black population concentration in adjacent areas is reduced substantially in this model. For men, this effect is reduced so substantially that it is no longer significant. This indicates that, for men, the effect of the level of black population concentration in the environment in which an LMA is embedded is exerted only indirectly, through the institutional structure of that context. The effects of black population concentration in the focal area are not reduced (for either men or women) when the institutional environment measure is added.

In the next step (model D), we add our Land-Deane correction for spatial effects. This term evaluates the spatial dependence of the dependent variable, indicating whether geographic areas (LMAs) are clustered according to the level of the dependent variable (e.g., high and low areas of the dependent variable, respectively, are clustered). This term has a significant effect on black-white inequality in the four equations predicting occupational inequality, indicating a clustering of areas by the level of occupational inequality — e.g., areas of high occupational inequality tend to be closer to other areas with high occupational inequality than to areas of low occupational inequality. The effect of the institutional environment measure is no longer significant in these models. When we examine the relationship between the institutional environment measure and the Land-Deane instrumental measure for the spatial distribution of occupational inequality, we find that the zero-order correlations (for men and women) are at or above .90. The fact that the institutional environment effect is not significant in this equation owes to the high positive correlation between the institutional environment and the instrumental term for spatial effects. This conclusion is supported by the very low tolerance statistics for these variables, below .25 and often below .20. This spatial effect measure may be capturing both reactive and interactive effects.

In order to evaluate further this proposition, we calculated a measure of the degree of spatial association for our measures of occupational inequality, black concentration in the focal area, black concentration in surrounding areas, and the institutional environment. To do so, we used Moran's I, which ranges from -1 (maximum negative spatial autocorrelation) to +1 (maximum positive spatial autocorrelation). As Goodchild (1986:5) states, this measure provides summary information in a single statistic on the spatial distribution of unequal attributes. Thus, just as a Pearson correlation coefficient measures the covariance between two attributes, Moran's I measures the covariance between two sets of similarities (level of attribute and spatial location).

The results of our analysis indicated high levels of positive spatial correlation. Moran's I values were: for log of percent black, .61; for log of percent black in adjacent areas, .50; for the institutional environment, .64; for Net Difference (ND) in occupational position, .49 for men and .53 for women; and for Average Relative Advantage (ARA), .43 for men and .54 for women. Following Goodchild's (1986) suggestion for separating reactive from interactive effects, we then calculated Moran's I for the residuals resulting from the regression of occupational inequality on our measures of black population concentration in surrounding areas and the institutional environment. These results showed large reductions in the spatial autocorrelation of occupational inequality. For men, the level of spatial autocorrelation for the net difference measure was reduced from .49 to .16, and for the ARA measure it dropped from .43 to .17. For women, the spatial autocorrelation in the net difference measure was reduced from .53 to .24 and for the ARA measure it dropped from .54 to .26.

These results suggest the presence of reactive spatial effects in these models. These reactive effects exist because the spatial clustering of occupational inequality is explained partially by the fact that areas with similar locations share not only similar levels of occupational inequality but also similar levels of attributes that explain occupational inequality — e.g., black population concentration and support for equal opportunity (the institutional environment). As indicated by the Moran's I measures reported above, both black population concentration in the surrounding area and support for equal opportunity in the institutional environment evidence significant amounts of spatial clustering. To the extent that these factors account for the degree of occupational inequality in an area, they also account for the spatial distribution of occupational inequality and thus constitute reactive influences on the level of spatial autocorrelation in occupational inequality.

Because it is clear that reactive spatial effects exist in these models and because the Land-Deane technique does not separate the reactive spatial effects from possible interactive spatial effects, we estimated models which, although speculative, might separate the known reactive spatial effects from possible interactive effects. We regressed our Land-Deane spatial effects instruments on our measures of percent black in surrounding areas and the institutional environment. We then substituted the residuals from these models for the original Land-Deane instruments in a new model (E). The coefficient for these spatial effects terms and the R^2 from these equations are identical to those from model D. However, the colinearity of model D is absent in model E. These modified Land-Deane imstrumental variables represent interactive spatial effects, net of known reactive effects.

Model E shows that, for both men and women, the institutional environment exerts the same effects that it did in Model C: Areas with greater support for equal opportunity have less occupational inequality. The effects of the measure of black concentration in adjacent areas also mirror those of Model C. This measure has no significant effect for men. But for women, occupational and wage inequality are greater in locales bordered by areas of higher black population concentration. The effects of the level of black population concentration in the focal geographic area are similar to those of Model D (e.g., negative and significant in all equations). Turning to the modified Land-Deane spatial effects term, we find that it has a positive, significant effect on occupational inequality for both men and women but it exerts no significant effect on wage inequality. The positive effect on occupational inequality suggests the presence of an interactive spatial effect on the level of occupational inequality in the focal area: The level of occupational inequality in the focal area depends, in part, on the level of occupational inequality in surrounding areas (a diffusion effect).

In summary, the strongest difference portrayed in the first step of our analysis is between women and men in the pattern of effects of black population concentration on inequality.[11] The results for men follow a traditional pattern: The level of concentration in the focal geographic area is the primary determinant of black-white inequality (the standardized coefficients for this variable range from -.48 to -.24, the highest in each model). But because the effect of black population concentration in adjacent geographic areas reduces the effect of black population concentration in the focal area for men, it appears necessary to consider the spatial context in which an area is embedded when specifying models of the visibility-discrimination hypothesis. The primary effect of the institutional environment measure in this analysis is on occupational inequality. Including this measure reduces both the effects of black population concentration in adjacent areas and black-white occupational inequality. The effects of the spatial effects term indicate the presence of an interactive spatial effect for occupational inequality.

For women, both black population concentration in the focal LMA and black population concentration of the area in which the focal LMA is embedded affect black-white inequality. When the measure of black population concentration in adjacent areas was added, the effect of black population concentration in the focal area was reduced, but remained significant. The institutional environment measure exerts strong effects on occupational inequality for women, as it did for men (standardized coefficients are .34 and .40). As was the case for men, the institutional environment measure reduces the effect of black population concentration in surrounding areas and reduces occupational inequality. The spatial effects term indicates the presence of an interactive spatial effect.[12]

SPACE AND PLACE EFFECTS, FULL MODELS

The results presented in Table 1 support our argument for considering characteristics of both the focal area and the area in which the focal area is embedded when testing the visibility-discrimination hypothesis: Both the level of black population concentration (in the focal and adjacent areas) and the institutional environment had important effects on the level of black-white inequality in the focal area. But one could argue that these effects are accounted for by human capital inequalities (e.g., education and experience), access to places of work (e.g., industrial separation in work), or some other aspect of industrial or employment structure. In Table 2, we present the results of an analysis that expands the analyses of Table 1 by including controls for these factors.[13] If effects of the spatial context in which an LMA is embedded (level of black population concentration and the institutional environment) persist net of these controls, then this will support strongly the argument for considering spatial context in models of the visibility-discrimination hypothesis.

Beginning with the equations involving men (panel A), the effects of black population concentration in the focal geographic area remain generally the same as in the earlier analysis (Table 1, models C and E) for the equations that do not include occupational inequality as an explanatory variable. Black population concentration in the focal geographic area has negative effects in all equations and these effects are significant in three of the four equations. For occupational inequality, the effects of black population concentration in adjacent areas are not significant. For inequality in hourly wage, the effects are stronger than they were in Table 1 (model C) and one of the effects is now significant (in the predicted direction). The institutional environment measure has the same effects on occupational inequality that it did in models C and E of Table 1, net of the additional controls for human capital inequality, employment structure, and industrial structure. The positive effects of this measure, which are consistent with our predictions, indicate that as support for equal opportunity in an area increases, black men enjoy better occupational outcomes, relative to white men. The institutional environment measure does not exert a significant direct effect on wage inequality. The spatial effects term has a significant, positive effect on occupational inequality, as it did in Table 1. This suggests the operation of an interactive spatial effect.

Panel B of Table 2 shows that our results for women also parallel the initial analysis (Table 1) to some degree. For occupational inequality, the effects of black population concentration in the focal area are reduced (from models C and E of Table 1) but remain significant. For the equations predicting inequality in hourly wage, the effect of black population concentration in the focal area is no longer significant. As in Table 1, all the effects of black population concentration in the surrounding area are significant. These negative effects indicate that as the level of black population concentration in adjacent areas increases, wage and occupational outcomes of black women, relative to white women, decline; the magnitude of these effects is reduced (relative to Table 1) for occupational inequality but strengthened for wage inequality. Thus, as in the initial analysis, the spatial context in which a focal area is embedded (the level of black population concentration in adjacent areas) is more consequential for black-white wage inequality for women than the level of black population concentration in the focal area is. Support for norms of equal opportunity in the institutional environment has a significant,

TABLE 2: Panel A (Men) — Spatial, Locality, and Institutional Environmental Effects on Inequality

Variable	Occupation: Net Difference		Occupation: Relative Advantage	
Black Concentration				
Focal LMA	-3.541**	-3.758**	-3.120**	-3.084**
Contiguous LMAs	.167	-.211	.922	.693
Institutional Environment	.432**	.442**	.253**	.280**
Other Spatial Effects	—	1.715**	—	2.056**
Other Inequality				
Educational	.498**	.378**	.400**	.289**
Experience	.186**	.163*	.129*	.101
Industry	-.078	-.067	-.036	-.031
Occupational	—	—	—	—
Employment Structure				
Rate	-.146*	-.213**	-.070	-.120**
Growth, 1980-90	.082	.279	-.323	-.121
Industrial Structure				
Core services	24.354**	31.119**	19.868**	23.928**
Periphery transformative	5.677	5.489	10.762*	9.301*
Industrial mix	2.015	3.083*	1.961*	2.373*
Intercept	-3.943	-13.430	-19.300	-22.351
R^2	.756	.782	.703	.736
N	155	155	155	155

Variable	Log Hourly Wage: Net Difference		Log Hourly Wage: Relative Advantage	
Black Concentration				
Focal LMA	-1.327	-.300	-1.840*	-.594
Contiguous LMAs	-1.662+	-1.711*	-.700	-1.068
Institutional Environment	-.038	-.163	.051	-.050
Other Spatial Effects	—	—	—	—
Other Inequality				
Educational	.238**	.094	.209*	.049
Experience	.438**	.385**	.350**	.298**
Industry	-.330**	-.307**	-.291**	-.276**
Occupational	—	.290**	—	.399**
Employment Structure				
Rate	-.338**	-.296**	-.247**	-.219**
Growth, 1980-90	.361	.337	.388	.517*
Industrial Structure				
Core services	12.513	5.452	17.435*	9.501
Periphery transformative	19.689*	18.043*	20.144**	15.846*
Industrial mix	-.138	-.722	2.066	1.283
Intercept	7.518	-8.661	-9.581	-1.874
R^2	.364	.404	.330	.380
N	155	155	155	155

+ $p < .05$ (one-tailed) * $p < .05$ (two-tailed) ** $p < .01$

TABLE 2: Panel B (Women) — Spatial, Locality, and Institutional Environmental Effects on Inequality

	Occupation			
Variable	Net Difference		Relative Advantage	
Black Concentration				
Focal LMA	-1.628+	-2.005*	-1.377+	-1.702*
Contiguous LMAs	-1.832+	-2.019*	-1.228+	-1.299*
Institutional Environment	.445**	.462**	.380**	.393**
Other Spatial Effects	—	2.340**	—	2.410**
Other Inequality				
Educational	.517**	.412**	.342**	.262**
Experience	-.075	-.053	-.412	-.034
Industry	-.419**	-.318**	-.305**	-.225**
Occupational	—	—	—	—
Employment Structure				
Rate	-.104	-.177*	-.019	-.086
Growth, 1980-90	-.070	.407	-.127	.238
Industrial Structure				
Core services	34.887**	45.759**	24.623**	33.988**
Periphery transformative	13.040	8.933	11.851+	8.114
Industrial mix	-2.093	-.653	-1.224	-.290
Intercept	13.355	1.595	-4.181	-4.029
R^2	.804	.826	.818	.839
N	155	155	155	155

	Log Hourly Wage			
Variable	Net Difference		Relative Advantage	
Black Concentration				
Focal LMA	-.167	.661	-.542	.172
Contiguous LMAs	-2.623**	-2.068*	-2.011**	-1.503*
Institutional Environment	.158*	.023	.147*	.023
Other Spatial Effects	—	—	—	—
Other Inequality				
Educational	.234**	.078	.149	-.065
Experience	.296**	.319**	.210*	.239**
Industry	-.040	.087	-.088	.032
Occupational	—	.303**	—	.383**
Employment Structure				
Rate	-.219*	-.188*	-.093	-.069
Growth, 1980-1990	.285	.306	.191	.358
Industrial Structure				
Core services	2.372	-8.200	6.982	-4.137
Periphery transformative	25.657**	21.705**	23.999**	17.744**
Industrial mix	-.658	-.024	.553	.880
Intercept	-7.709	-11.756	-16.439	-15.665**
R^2	.376	.439	.429	.514
N	155	155	155	155

+ $p < .05$ (one-tailed) * $p < .05$ (two-tailed) ** $p < .01$

positive effect in the equations predicting occupational and wage inequality. Consistent with our predictions, these positive effects indicate that as support for equal opportunity in an area increases, black women enjoy better occupational and wage outcomes, relative to white women, net of other controls. Finally, our term for spatial effects has a significant effect in the equations predicting occupational inequality. Once again, this signals the presence of an interactive spatial process.

We turn next to the equations predicting wage inequality which include a control for occupational inequality. For men, the effect of black population concentration in the focal area is reduced to nearly zero in both equations when our measure of occupational inequality is included. The effect of black population concentration in the adjacent area increases slightly and is now significant in one equation. These results indicate that most of the effect of black population concentration in the focal area is exerted indirectly through occupational inequality, but the effects of black population concentration in adjacent areas are not.

For women, the effect of black population concentration in adjacent areas is reduced in both equations. The effect of the institutional environment measure is reduced substantially in both equations and is no longer significant. This indicates that, for women, part of the effects on wage inequality of black population concentration in surrounding areas and the institutional environment are exerted indirectly, through occupational inequality.

Conclusions

In this article, we expanded the range of place and space factors used in previous tests of the visibility-discrimination hypothesis. Our results show that our first expansion of these models — inclusion of a measure of support for equal opportunity in the local institutional environment — improves our understanding of the role place plays in the visibility-discrimination hypothesis, but its consideration seems to be more consequential for women than for men. We also find that expanding place effects to include the spatial context in which an area is embedded (by including a measure of the level of black population concentration in adjacent geographic areas and an indicator of spatial dependence effects) is also important to our understanding of the visibility-discrimination hypothesis. These results suggest that effects of black population concentration do transcend areal boundaries and this fact should be considered in future research on the relationship between black population concentration and inequality. That conclusion is supported by the fact that the effects of black population concentration in the focal area on black-white economic inequality are generally reduced when a measure of black population concentration in adjacent areas is included in these models.

But the effect of black concentration in adjacent areas seems to be more consequential for women than for men: In our final models, it affects both occupational and wage inequality for women but only wage inequality for men. The literature on the "black belt" (counties in the South whose population is at least 33% black (Falk, Talley & Rankin 1993:56)[14] suggests a possible explanation for this pattern. This area is characterized by "persistent poverty, lack of industrial growth, high occupational segregation, and low quality of life for blacks" (Rankin & Falk 1991:225), slow population growth, a large dependent population (large proportions of children and elderly), and a large number of female-headed households (Falk, Talley & Rankin 1993). Its occupational structure has atypically high proportions of service occupations, such as nurses' aids, cooks, private household workers, and janitors (Falk, Talley & Rankin 1993). Because of family ties and responsibilities, women are less likely than men to be able to migrate out of these areas to seek economic opportunities. Burr et al. (1996:398) suggest that because blacks generally have fewer resources available than whites, "high levels of inequality may mean less ability to 'escape' [these areas]." In areas with higher relative inequality — like the black belt — black females tend to have higher fertility rates and fewer resources to support outmigration.

These ties to geographic place make it more likely that women in general — and, given the history of racial discrimination in the area, black women in particular — are relegated to low-level positions such as private household workers, nurses' aids, and cooks. This pattern could explain why the level of black population concentration in the area surrounding a focal area affects economic outcomes more strongly for women than for men: Areas in and around the black belt have the highest concentrations of black population in adjacent areas and the poorest job opportunities for black women. Because black women are least able to migrate and most likely to be tied to these areas, we find a stronger effect of black population concentration in adjacent areas for women than for men.

Predicting both occupational and wage inequality allowed us to compare the effects of place and space factors on these two outcomes and to examine the direct effects of these place and space factors on wage inequality net of occupational inequality and the indirect effects that are exerted through occupational inequality. Our results show that occupational inequality is the strongest predictor of wage inequality, for both men and women. Net of all other controls, it accounts for between 5% and 9% of the variance in wage inequality. Further, we find that the effect of the institutional environment on wage inequality is indirect, through occupational inequality. Thus, the institutional environment affects wage inequality by structuring access to occupations.

We are better able to explain occupational inequality than wage inequality. As we note above, part of this pattern may owe to the fact that our occupational measures may be more precise than our wage measures. This finding may also reflect differences in the way in which these outcomes are determined: Although it is probably difficult for most employers to pay differentially individuals in the same position, the criteria for access to work may be more nebulous and open to arbitrary decisions. The strong effects of occupational inequality on wage inequality indicate the importance of these decisions. These findings therefore highlight the importance of considering multiple outcomes and the relationships among them when testing the visibility-discrimination hypothesis.

Overall, our results offer two key substantive implications. First, they suggest that failing to consider the social structure of the context in which a focal area is embedded may lead researchers to commit what Lieberson has called the "error of contamination." When evaluating the visibility-discrimination hypothesis, it is necessary to consider the population structures of both the focal area and the surrounding area in which it is embedded. Failure to do so may cause researchers to attribute effects to characteristics of a local place, when in fact these effects may be due (at least in part) to characteristics of the environment in which a place is embedded. The resulting overemphasis on the effects of local place could lead to specification errors and affect adversely the development of both theory and policy. Our analysis also indicates that models which examine spatial units, either as the focal unit or as a context for individual action, should not only examine spatial processes that are related directly to the dependent variable but also should consider spatial processes involving explanatory variables.

Second, our findings show that in models predicting intergroup economic inequality, when we include black population concentration in a focal labor market area, black population concentration in adjacent areas, and support for equality of opportunity in these surrounding areas, all three have significant effects. Further, when our measure of support for equal opportunity in the institutional environment is included, the effects of black population concentration on intergroup economic inequality are reduced. This supports the proposition that perceived threat is the mechanism underlying the relationship between black population concentration and increased minority-majority group inequality. Inclusion of this measure does not, however, eliminate entirely the effect of black population concentration. This could indicate that our measure of support for equal opportunity taps some, but not all of the variance in inequality due to threat and that other forms of perceived threat need to be measured in future research. Alternatively, these results could signal that some mechanism other than perceived threat (e.g., competition (see Semyonov 1988)) also may affect the relationship between black population concentration and black-white inequality. But the fact that introducing our institutional environment measure does reduce the effects of black population concentration signals that our measure captures a significant part of the effect of perceived threat and demonstrates its role in the visibility-discrimination process.

Previous research has suggested that minority population concentration affects intergroup inequality. We have augmented this research by showing that the effect of the visibility-threat mechanism on intergroup inequality is determined not only by characteristics of the places in which individuals work but also by the social structures of areas that lie beyond the geographic boundaries of these local labor markets.

Notes

1. Competition is sometimes posited as an alternative mechanism (Semyonov 1988).

2. Although this resulted in the inclusion of a few LMAs that had less than 5% black population, the 155 LMAs that were included for men is close to the 165 LMAs included in Tigges and Tootle's (1993) study (which analyzed only men). The LMAs that were less than 5% black population all had significant numbers of blacks in their population (e.g., Seattle, Washington; Portland, Oregon; Providence, Rhode Island).

3. These scores are percentile rankings of occupations, based on the education and income of the incumbents of each occupation.

4. We derived our measure of hours worked by multiplying the number of weeks worked in 1989 by the usual number of hours worked per week in 1989.

5. The weight is calculated by dividing the total population of each adjacent LMA by the centroid distance (between each adjacent LMA and the focal LMA).

6. We use a state-level measure of the local institutional environment because several aspects of the local environment are determined at a state level (e.g., Fair Employment Practice Laws) (see Beggs 1995). We assume that, even though within-state variation exists in the local institutional environment, most of the variation occurs across states.

7. Where all counties contained in an LMA are within the same state, the score for that LMA is the state score. However, because many LMAs cross state boundaries, this was often not the case. But a focal labor market may share the institutional environment score with its surrounding LMAs to the extent that it shares state identity with some or all of the counties in these LMAs.

8. Because of the differences between places in the sum of the distances to other LMAs, we used a standardized form of the distances. This weight was constructed by summing the distance-inverse terms (1 / each distance) associated with a focal LMA and then expressing each of these terms as a proportion of the total.

9. Cohn and Fossett (1995) included a measure of traditional occupational mix in an area, but stated that this measure traces to traditional industrial differences in an area. We therefore use the industrial, rather than the occupational measure.

10. Because one of our dependent variables is occupational inequality, the industrial measure is more appropriate. We note that this measure could be affected by the level of black population concentration in focal and adjacent areas: As the levels of black population concentration increase, employment segregation may also increase. Because we use this measure to tap the effects of competition, we control for any effects of black population concentration that are exerted through segregation.

11. A second notable difference is that these models account better for the variation in occupational inequality than wage inequality. This pattern may be due in part to the characteristics of our data: Our measures of occupational inequality were constructed from the 1990 Census EEO files (based on the full 1990 Census sample), whereas the wage inequality measures were constructed from the 1990 Census PUMS-L file (which was a much more restricted sample [.45%]). Thus, the estimates of wage inequality

should have less precision than the estimates of occupational inequality. This difference may underlie our ability to explain occupational inequality better than wage inequality.

12. In order to evaluate the possibility that our findings concerning the area in which an LMA is embedded are simply proxy findings for state-level phenomena, we performed additional analysis including a measure of the level black population of the states associated with each LMA. For both men and women, the state level measure has no effect when the institutional environment measure is included. For women, the black concentration in contiguous area measure is significant. Results of this analysis are available from the first author upon request.

13. Because the analysis in Table 1 indicated that there were no spatial effects for wage inequality, we exclude the spatial effects terms in Table 2 for equations predicting wage inequality. Table 1 showed both reactive and interactive spatial effects in the models for occupational inequality; we therefore used a modified Land-Deane term in the analysis reported in Model E of Table 1. In Table 2, we report equations predicting occupational inequality with and without this term.

14. It is referred to as a "belt" because the counties are distributed nearly contiguously from Virginia and the Carolinas through Alabama and Mississippi to Louisiana and Arkansas.

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APPENDIX: Descriptive Statistics

	Men		Women	
	Mean	Std. Dev.	Mean	Std. Dev.
Black Concentration				
Focal LMA (log)	2.853	0.642	2.853	0.642
Contiguous LMAs (log)	2.822	0.669	2.822	0.669
Institutional Environment	22.962	6.701	22.962	6.701
Net Difference				
Occupation(Nam-Powers-Terrie)	-35.410	6.746	-28.721	9.130
Hourly wage	-59.377	4.809	-51.872	4.863
Education	-55.517	6.047	-50.823	5.873
Experience	-49.109	4.525	-49.546	3.950
Average Relative Advantage				
Occupation(Nam-Power)	-21.681	4.212	-19.520	6.802
Hourly wage	-34.556	4.074	-29.836	3.943
Education	-17.672	3.930	-14.614	3.322
Experience	-29.401	3.707	-29.520	2.843
Generalized Population Potential				
Net difference:				
Occupation(Nam-Powers-Terrie)	-28.527	2.608	-22.621	2.741
Hourly wage	-52.710	1.922	-44.588	2.254
Average relative advantage:				
Occupation(Nam-Powers-Terrie)	-17.946	1.518	-15.332	2.004
Hourly wage	-30.749	1.192	-25.720	1.415
Dissimilarity Index, Industry	23.374	3.801	25.352	4.500
Employment Ratio	57.645	5.497	57.645	5.497
Employment Growth Rate	1.811	1.295	1.811	1.295
Core Services	19.947	4.338	19.965	4.788
Periphery Transformative	9.823	5.891	7.367	6.010
Industrial Mix	4.798	0.256	5.291	0.337
Number of labor market areas	155		155	