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The Significance of Scale in the Analysis of Gentrification

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Abstract

Employing housing and population data available from the U.S. Census of Housing for 1970 and 1980, we compare block level delineations of gentrification with tract level delineations within several historic neighborhoods of New Orleans, Louisiana. Contrary to Spain's (1992: 132) assertion that block level census data are not adequate to detect the presence of gentrification, a geographical delineation of gentrifying activity during the 1970's is achieved.

Methodologically, there are two main findings. First, we display the inadequacies of census tract level definitions of where gentrification is occurring. We conclude that gentrification is a small-scale process that is best examined on a larger scale than census tracts allow. A related implication is that previous analysis of locational relationships based upon census tract definitions of gentrification may be severely flawed (cf., Laska *et. al.*, 1982). Finally, we show that heightened real estate activity is an unsatisfactory indirect measure of gentrification.

More importantly, the block level delineation developed allows a fine-grain analysis of several theoretical issues regarding gentrification. First, support for residential location theory is shown by the occurrence of gentrifying blocks along the edges of solidly European-American, middle-class neighborhoods. Concomitantly, the avoidance of large African American residential areas is also demonstrated. Secondly, our results are consistent with rent gap theory as evidenced by the close correlation of gentrification with accelerated average rents. Gentrifying blocks also illustrate contagious behavior by their concentration and clustering in discrete locales within the study area. Our findings also support theories that argue gentrification occurs in concert with decline. Finally, we examine the timing of historic district designation relative to gentrifying activity. In the eastern portion of the study area, the data supports the view that gentrification occurs contemporaneously with district designation. On the other hand, gentrification occurred in the central and western portions of the study area without such designation.

The Significance of Scale in the Analysis of Gentrification

INTRODUCTION

The primary goal of our research is methodological. While it is common knowledge that gentrification takes place in nodes and niches of inner cities and rarely at the scale of a census tract (see Shaffer and Smith, 1986:350 and Ley, 1988:44), census tract level data is almost universally employed in both multi-city and single-city studies of the gentrification process. The problem, often lamented, is the limited data released for enumeration areas smaller than tracts. Spain (1992: 132) argues that although racial change data is available at the block level, "socioeconomic characteristics necessary to detect the presence of gentrification are available only at the tract level." The primary goal of this paper is to demonstrate that, in fact, this is not the case.

In terms of the practical significance of a block level gentrification process for scholars and policy analysts, Spain also argues that:

... if gentrification is to be taken as a national phenomenon, worthy of attention, it will have to be measurable on the census tract level. If it is only a block-by-block phenomenon, its potential for changing the racial composition of central cities is slim (Spain, 1981: 16).

Countering Spain's argument is the theoretical possibility that gentrification could be having a large effect on a city's housing market and be hardly noticeable at the tract level of analysis. Scores of city blocks could be experiencing gentrification in a particular city—clearly a significant phenomenon—but be diluted by their scattering in census tracts which are also experiencing continued decline in other areas of the tract.

Our analysis demonstrates that tract level measures simply are not sensitive (precise) enough to consistently capture the uneven nature of gentrification, let alone delineate its complex processes.

GENTRIFICATION DEFINED

For purposes of our analysis, gentrification is defined as the reinvasion of inner-city neighborhoods (largely African-American in population) by the middle- and upper-classes (normally of European heritage). This process involves the substantial replacement of a neighborhood's lower-income residents with newcomers of higher income who renovate and upgrade the neighborhood (Holcomb and Beauregard, 1981: 39-40). Gentrification can take several different forms. It can involve renovation of housing stock by middle class households in existing residential neighborhoods; this is gentrification in the strictest sense (Ley, 1988: 32). In other cases, the process involves private redevelopment of existing working class residential areas. In these cases, the existing building stock is not of much value; rather it is the land which has the investment value. The process can also involve the development of middle class housing in formerly non-residential areas. This type of redevelopment occurs most frequently in economically obsolete industrial areas (Schaffer and Smith, 1986: 347). Finally, gentrification can be driven by different combinations of private market forces, public state intervention strategies, and nonprofit community development organizations (Lauria, 1982, 1984, Beauregard, 1990, and Wagner, 1995).

Although gentrification is first and foremost a residential process, it also entails commercial redevelopment. As the socioeconomic character of the neighborhood

changes, retail and recreational facilities adjust to the changing demand. Businesses serving the incumbent population often find their customer base dwindling and are forced to close. New businesses serving the needs of the emerging middle class population enter the neighborhood. As the socioeconomic composition of the neighborhood changes, so does the perception of acceptable land uses. Laska and Spain (1980) among others have documented an intolerance among in-migrants for industrial and institutional land uses existing in their neighborhoods. "Neighborhood" organizations often transform around this issue and work towards re-zoning (Thomas, 1987: 43-44).

Schaffer and Smith (1986:348) have noted that the debate over gentrification revolves around three questions: the significance of the process, the effects of gentrification, and its causal elements. The first of these issues is of critical importance. How significant is gentrification in reversing the decline of the inner cities? If gentrification is a small-scale, spatially restricted occurrence with little effect on the city as a whole, then quantitatively its public policy significance is minimal. If, however, gentrification is seen as part of the larger restructuring of urban space in western capitalist cities, qualitatively its policy and theory import is amplified.

This latter view of the significance of gentrification as part of a larger restructuring of urban space (Schaffer and Smith, 1986: 349) sees a transition of American cities to the "European model," characterized by a preserved urban center surrounded by high income residential and commercial centers (Bourne, 1993). This process has also been referred to as "social Manhattanization" (Williams and Smith, 1986). The restructuring of urban space is tied directly to the transformation of the economic function of cities

and the national shift to a service economy. The change in the function of cities from production and distribution to centers of control and consumption by elites has been made possible by capital mobility and permissive technology (Bluestone and Harrison, 1982). Middle income manufacturing jobs which benefit the working class are lost during this restructuring (Fainstein and Fainstein, 1983). The result of this shift is the increasing inequality in the income of city residents (Tomaskovic-Devey and Miller, 1982). The shift away from a production economy on a national scale further enhances the trend towards a dichotomy of elite and poor in inner cities.

Research has established the relationship between the economic trends in the urban core and the middle class reinvasion of the inner city (Gale, 1984). The restructuring of the inner city housing market is predicated on the growing downtown labor market, based on private and public sector office employment (Fainstein and Fainstein, 1983: 7; Ley, 1988: 32). In his analysis of six major Canadian cities, David Ley (1988) has shown a link between the growth in office employment and the changing composition of inner city residential areas. Between 1971 and 1981, the percentage of inner city residents employed in the quaternary sector (professional, managerial, technical, and administrative jobs) increased from 18.2% to 27.3%. In the metropolitan areas, non-quaternary jobs have grown at a healthy rate. However, within the urban center the creation of quaternary employment has been matched by withdrawal of non-quaternary jobs (Ley, 1988: 34). A significant shift in the urban employment patterns of Canadian cities is obviously underway.

THE RESEARCH PROJECT

The subjects of this research are several historic uptown neighborhoods in New Orleans, Louisiana. According to an earlier study of gentrification in New Orleans (Laska et al, 1982), several of the census tracts in this portion of the city have experienced gentrification. The study area boundaries generally correspond to the nineteenth-century expansion of New Orleans by American immigrants to the City. The boundaries, therefore, have an historical basis. They also serve to circumscribe all gentrifying areas of the City upriver (or west) of the central business district. The study area is strongly defined by physical, land use, and cultural boundaries, and to neighborhood delineations by the City of New Orleans (see Map 1). The study area was limited to a portion of the City due to the volume of data to be collected and analyzed.

Several goals are pursued in this research. First, this is a methodological study. The intent is to develop a methodology which provides a detailed and fine-grain description of the extent and mechanics of the gentrification process. We investigate gentrification at the city block level and demonstrate that sufficient data (including racial and housing statistics) are published to allow delineation and analysis of gentrification.

While other studies have utilized heightened real estate activity as an indirect measure of gentrification, the validity of this measure has not been tested. Thus, the second goal of this study is to evaluate the validity of real estate activity as a measure of gentrification by comparing its results to the delineation obtained from the census reports in Uptown New Orleans. The third goal of this research is to investigate the contagion model of gentrification. This process appears to be similar to the disinvestment process where self-reinforcing mechanisms are operating to cause

clustering of investment and coalescing of nodes over time. Several earlier studies have suggested that this process is operating in gentrifying neighborhoods (see O'Loughlin and Munski, 1979 for one that focuses on New Orleans). We argue that a block level of analysis will better allow an investigation of this process. A fourth goal of this research is to briefly investigate the locational variables utilized by Laska et al (1982). Again the use of block level data allows a finer-grain analysis of residential location theory than that achieved by Laska et al. The variables investigated include centrality to historic areas, avoidance of poverty areas, and avoidance of high crime areas.

This latter goal leads to the theoretical implications of the research. The reinvasion of declining inner-city neighborhoods by the middle class represents a reversal in the process predicted in the traditional model of neighborhood succession. The traditional model predicts continued decline of inner city neighborhoods as middle class suburbs expand outward from the city core. Thus, gentrification seems to contradict residential location theory. Essentially, this theory argues that residential location choices, especially for the middle and upper classes, are based largely on class and racial similarities. This research investigates these topics at a fine-grain block level and demonstrates the theoretical importance of scale of analysis.

THE CASE STUDY PROFILE

Historical Development

An understanding of the largely nineteenth-century origin of the housing stock and social geography is important for analyzing recent neighborhood changes. The study area is located upriver or "uptown" of the original French city. New Orleans was established in 1718 with a formal grid pattern of streets laid out on the north bank of the Mississippi River on the cusp of a sweeping crescent of the River. This grid, which later became known as the Vieux Carré or "old square," served as the focus of New Orleans' urban growth throughout the eighteenth century. As population grew rapidly with the immigration of "Americans", the city spilled upriver and downriver along the natural levee of the Mississippi River. Most of the American immigrants chose to settle upstream, or uptown (Lewis, 1976:38). This westward urban expansion continued throughout the nineteenth century as one small suburban city after another was swallowed up. The expansion was finally complete when the City of Carrollton was annexed to New Orleans in 1874.

Development in the study area, of course, was not homogeneous. Several discrete residential areas or neighborhoods formed as the wave of settlement advanced upriver. Elite residential areas developed early in the Lower Garden District, the Garden District, and along St. Charles Avenue. Middle and working class neighborhoods developed as well, most notably in the Irish Channel and Central City. Upper and working class neighborhoods also grew up in the streetcar suburb of Carrollton. A patchwork quilt of residential areas spread across the study area, with a wide variation

in economic status and ethnic and racial origin. By the beginning of the twentieth century, the study area had substantially filled in with settlement and its physical and social geography were well defined.

Major streets perpendicular to the river were placed along plantation property lines as the City spread upriver (Lewis, 1976:42). These include Melpomeme Street, Jackson Avenue, Louisiana Avenue, Napoleon Avenue, Jefferson Avenue, Nashville Street, Broadway Street and Carrollton Avenue. Due to the convex edge provided by the river, these streets tend to converge like spokes in a wheel as they approach the northern extreme of the study area. St. Charles Avenue, which parallels the Mississippi River along the 40 arpent line of the former plantations, served as the major cross street and developed into one of the most important residential thoroughfares in New Orleans. The 1830's installation of the New Orleans and Carrollton streetcar line only enhanced its development as the main artery of the American residential sector of the City.

Lewis argues that the topography of New Orleans and the unique street pattern of the American residential areas (the present study area) profoundly influenced the historic patterning of European-American and African-American population in the City (1976:44-45). He describes the two types of African-American residential areas as "backswamp ghettos" and "superblocks." The backswamp ghettos occurred throughout the City as settlement expanded during the nineteenth century. Housing for African-Americans was pushed to the edge of the Mississippi River's natural levee, e.g. the interface of relatively high land with the low-lying, poorly drained backswamp. A discontinuous belt of African-American residential areas was thereby created some distance from the River's banks.

The other form of African-American segregation was unique to the American residential portion of the City. Here the widely spaced radial boulevards, when crossed by St. Charles Avenue, formed "superblocks" (Lewis, 1976:46). Many of these superblocks developed affluent European-American perimeters with working class African-American cores. Along the major streets, large houses were built for the economic elite. At the core of these superblocks were the residential areas for African-American servants and workers. Middle and working class whites served as a buffer between the two extremes. Thus, several discrete and well-defined pockets of African-American residential areas were created in the City.

Spain (1979:86) points out that these superblocks are a special adaptation or form of the "backyard pattern." This pattern of African-Americans residing in close proximity to European-American residential areas was common in Southern U. S. cities in the antebellum period. The results of this pattern were relatively integrated neighborhoods and the lack of large African-American ghettos, which developed later in most urban areas. Spain reports (1979:90) that the nineteenth century pattern remained stable in New Orleans until the 1930 census.

Lewis documents the increasing racial segregation of New Orleans between 1940 and 1970 (1976:98-99). He argues that African-American neighborhoods remained in the same places as they had first developed in the previous century, but they were growing and spreading to form a more continuous "superghetto." Spain (1979:90-91) attributes the increasing segregation to several factors. These include technological advances, such as drainage improvements, and extensions of streetcar lines, which allowed whites to suburbanize new areas. She also cites public housing

projects, urban renewal, and gentrification as mid- and late-twentieth century forces which exacerbated the segregation of residential areas.

The most common measure of residential segregation, the index of dissimilarity, for New Orleans was 81.0 in 1940, 86.3 in 1960, and then showed a drop to 83.1 in 1970 (Spain, 1979:95). Spain attributes the drop between 1960 and 1970 to the development of mixed residential areas in eastern New Orleans during that decade. She argues, however, that this is a temporary improvement and predicts that the residential segregation index would continue to rise.

Uptown New Orleans, 1970¹

In 1970, the population of the study area was 195,380 persons, which was nearly 33% of the total population of the City. African-Americans made up 54.09% of the population, compared to the citywide percentage of 45%. The study area contained 41.49% of the City's rental housing, and only 24.37% of the owner-occupied housing units. Thus, in 1970 the study area was more heavily African-American than the City as a whole and had a higher percentage of rental housing (and, correspondingly, a lower percentage of owner-occupied housing) than the City.

A review of the 1970 housing census data reveals a high variability in the African-American population of the study area census tracts. Map 2 provides a spatial representation of the racial variability in the study area. Eighteen of the tracts contain less than 20% African-American population; further, six of these contain less than 1%. On the other end of the spectrum, 15 of the tracts contain populations which are 80% or greater African-American; seven of these are 99-100% African-American. When taken together, these extremes (less than 20% or more than 80% African-American) represent

the majority (33 of 61) of the study area tracts. These tracts contain 108,693 persons, or 55.6% of the total study area population. The remaining tracts are closer to the study area average of 54.09% African-American population. As will be shown below, this fact does not indicate truly integrated neighborhoods.

A clearer delineation of the study area's racial geography is provided by the block statistics of the U.S. Census Bureau's Housing Census. Map 3 presents the block-by-block distribution of African-American population. Clearly seen in this map are two primary axes of predominantly European-American residential areas. One of these is centered on the Audubon Park/Loyola and Tulane Universities corridor in tracts 120, 121.01 and 121.02 (refer back to Map 1). This large area stretches from the Mississippi River to Earhart Expressway and is bounded on the west by Leonidas Street and Napoleon Avenue on the east. The other main axis of European-American population is the corridor between St. Charles Avenue and Magazine Street, stretching from Napoleon Avenue to the Central Business District (CBD). Included in this area is the Garden District, an exclusive upper-class European-American residential area since its initial development in the nineteenth century.

Likewise, predominantly African-American residential cores are situated in two locations. The largest of these is the Central City area located north of St. Charles Avenue and stretching from the CBD to Napoleon Avenue. The other focus of African-American population is found on the western edge of the study area. This residential zone is located between Leonidas Street and the Jefferson Parish line and extends from the Mississippi River to Palmetto Avenue on the northern edge of the study area.

Several racially mixed zones, of course, also exist in the study area. The

boundaries between predominantly African-American and European-American areas contain corridors of racially mixed blocks. In some cases, these transitional zones are fairly broad, while in other cases the distinction between African-American and European-American residential areas is abrupt. The northern edge of the St. Charles Avenue/Magazine Street European-American residential corridor is particularly sharp. Another mixed area exists along the southern border of this same European-American corridor. Here, the transitional area of mixed racial population is broader. The most compelling aspect of Map 3 are the superblock ghetto areas described by Lewis(1976). Three of these distinct pockets of predominantly African-American areas within predominantly European-American areas are located within the corridor defined by Carrollton Avenue and Lowerline Street. Census tracts within this area include 125, 125, 127 and 128. Another circumscribed concentration of African-American population exists at the northern extreme of this same corridor in census tracts 124, 128 and 72. Two additional superblock ghettos exist in the corridor between Jefferson and Napoleon Avenues. The northern pocket is the largest of all the superblock African-American cores and covers the majority of tracts 109 and 111.

To further illustrate the differences between tract and block level data and their presentation of the study area's racial geography, Figure 1 shows histograms of the two data sets. The most obvious conclusion to be drawn from this comparison is that tract level data greatly obscures the racial polarization of the study area. The tract level data indicates no exclusively African-American or European-American tracts and a large number of mixed neighborhoods. The block level data presents a strikingly different picture of the study area. The largest frequency range is zero percent African-

American; the next most frequent is 100 percent African-American. The number of racially mixed blocks is much less than the census tract-level data would indicate.

Table 1 shows the results of a correlation analysis of several other housing census block level variables with the percentage African-American variable. The purpose of this analysis is to investigate the relationship of the housing variables to the distribution of African-American population in the study area. Several interesting insights are provided in this analysis. The strongest correlation with the percent African-American variable is a negative relationship with average rent. The value of -0.56 is significant at the 0.001 level. Thus, lower rents are strongly correlated with the largely African-American portions of the study area. The next strongest relationship is the positive correlation with the number of housing units containing more than one person per room. The value of 0.41 is also significant at the 0.001 level. Not surprisingly, crowded housing units are more prevalent in blocks containing a high percentage of African-American population. Weaker, yet still significant, relationships are noted between largely African-American populated blocks and higher densities of population (0.26) and housing units (0.23) at the 0.02 confidence level. No significant relationship between African-American percentages and the number of owner-occupied units or the number of persons per unit were found in the study area during the 1970 census. In summary, African-American neighborhoods contain more housing units, are more densely populated, contain a disproportionate share of crowded housing units, and have lower rents than European-American neighborhoods.

GENTRIFICATION IN UPTOWN NEW ORLEANS

THE CITY-WIDE CONTEXT

During the 1970's, the City of New Orleans lost 35,956 in population, which is a 6% decline from 1970. The African-American population of the City, however, gained 40,841 persons, which was a 15% increase from 1970. This increase was more than offset by the loss of European-American population (mostly white, but including Hispanics and Asians). The European-American population during this decade declined by 24%, or 76,797 persons. The result of these opposite trends was that the City's majority was African-American (55%) by 1980. In 1970, the city was only 45% African-American.

The study area, representing 33% of the city's population in 1970, experienced an even more dramatic loss of population than the City as a whole. The study area lost 31,119 residents during the 1970's, which represents a loss of 16%, nearly three times the citywide loss rate. In fact, the population loss from the study area accounts for 86.5% of the City's net loss. The other significant aspect of this loss is that the African-American population in the study area also declined during the decade. The loss of 6,862 African-American persons is a 6.5% loss for the study area, which is in stark contrast to the overall 15% increase in African-American population citywide. Because the loss of European-American population is even greater than the African-American population loss, the study area increased from 54% African-American in 1970 to 60% African-American in 1980.

In terms of housing unit changes during the 1970's, the City of New Orleans

gained 18,108 housing units, or a 9% increase from 1970. This included increases in both owner-occupied and rental housing units. Combined with the population decline described above, this resulted in a significant decrease (35%) in crowded housing units, i.e. those with more than one person per room.

In contrast to the citywide trend, the study area lost 2,040 housing units during the decade. This represents a 2.8% loss of the 1970 housing stock, in contrast to the citywide gain of 9%. The reduction in housing units was the result of a strong decline in rental housing coupled with a small increase in owner-occupied housing units.

A correlation analysis was performed with the 1980 Housing Census data (Table 3). Not unexpectedly, the same significant relationships shown in the 1970 analysis are evident in 1980. Interestingly, all but one of the variables correlated with the African-American percentage of the study area's blocks show a slight lessening in the strength of their relationship. The exception to this trend is the theoretically significant, strengthened negative correlation of African-American population percentage with average rent. The coefficient increased from -0.56 in 1970 to -0.73 in 1980.

GENTRIFICATION DELINEATED WITH BLOCK LEVEL DATA

The block-by-block distribution of African-American population in the study area in 1980, as revealed by the 1980 Housing Census, is shown on Map 4. Comparison of this map with the 1970 racial geography of the study area (Map 2) reveals subtle changes in the distribution of African-American residential areas. In order to more clearly show where changes occurred during the decade, Map 5 was produced to display both positive and negative changes in the African-American percentage of each

block's population.

Blocks showing changes of less than 10% in their African-American population percentage, either positive or negative, occur frequently and are distributed throughout the study area. Figure 2, which presents a histogram of the block-by-block change in African-American population percentage between 1970 and 1980, further illustrates this observation. The large number of blocks in the "-0.01", "0", and "0.01" percentile ranges (representing blocks ranging between -9.99% and +9.99%) reveals that the great majority of blocks in the study area either did not change their racial makeup or experienced less than 10% change from the 1970 Census.

In order to clearly identify blocks experiencing significant changes in their racial makeup, Map 6 shows only blocks experiencing a change of 10% or more between 1970 and 1980.² In the context of a citywide 27% loss of European-American population during the decade, blocks showing a significant increase (10% or greater) in European-American population can best be explained by the process of gentrification. The delineation of gentrification for the decade under study can be defined by the occurrence of multiple blocks of significant negative changes in African-American population percentages. Each census tract which exhibits this characteristic is likely to be experiencing gentrification.

Based on the above argument and the general experience of gentrification in U.S. cities, it is not unreasonable to define gentrification in terms of African-American-to-European-American racial change in Central City neighborhoods. A more robust delineation, however, can be achieved through an analysis, which is provided below, using a combination of data available from the U.S. Housing Census. The incidence of

significant decreases in African-American population percentage (Map 6) will, henceforth, serve as a control on the delineation derived from the full set of variables utilized in this paper.

A strict definition of gentrification is obtained by identifying those blocks that show a decrease in African-American population percentage of 5 percent or greater and changes in three additional variables.³ The other changes required in this delineation are an increase in average rent greater than the study area increase, an increase in owner-occupied housing units greater than the study area increase rate, and a decrease in the number of crowded housing units (those with 1.01 persons per room or more) greater than the study area decrease rate.⁴ Utilizing these criteria, 31 blocks are identified as experiencing gentrification during the 1970's. The locations of these blocks are shown on Map 7. A comparison of Map 7 with the control data in Map 6 shows a close fit; all tracts showing multiple blocks undergoing gentrification also show multiple blocks of significant reductions in African-American population percentage.

This delineation, however, is overly restrictive. The two variables which serve to underrepresent the occurrence of gentrification are the required increases in owner-occupied units and the reduction in crowded housing units. While the standard definition of gentrification involves an increase in owner-occupied housing units, i.e. European-American middle class families purchasing homes and displacing African-American renters, other possible outcomes can result from the influx of the European-American middle class into a block or neighborhood. European-American renters can displace African-American renters or even African-American home owners, and these situations will not register as gentrification in the above analysis.

Similarly, the requirement that blocks show a decrease in crowded housing units at a greater rate than the study area as a whole may result in missing many blocks which are undergoing gentrification. New European-American residents may occupy previously abandoned housing units which would not cause a decrease in crowded units. Also, increasing rents in upscaling neighborhoods could force incumbent African-American families to increase their household size (e.g. a working adult child chooses to stay at home) to help compensate, thus resulting in increased crowding. Finally, many blocks contained no crowded housing units in 1970, and, therefore could not show a decrease over the decade.

To correct for the restrictive aspects of this delineation of gentrification, a more flexible analysis was employed. The first two requirements remain unchanged. That is, a negative change of 5 percent or more in the African-American population and an increase in the average rent greater than the increase for the study area as a whole are still required. The expected alterations to the housing structure of a gentrifying neighborhood include a loss of total housing units, an increase in owner-occupied units, and a reduction in the number of rental units. As middle class newcomers move into inner city neighborhoods, houses divided into multiple housing units are converted into single family houses. Rental units are lost by this process as well as by the increase in home ownership that also occurs with middle class upscaling. Instead of the requirement that a block show an increase in the number of owner occupied units at a higher rate than the study area increase, the candidate blocks could alternatively meet one of two other criteria: either a decrease in total housing units greater than the study area loss rate or a decrease in rental units greater than the study area loss rate. The

flexibility obtained by this alternative analysis was intended to capture the changing housing unit structure in upscaling blocks.

Decreasing population density is another characteristic expected in gentrifying residential areas. This is the result of smaller family sizes expected in incoming middle class families when compared to the incumbent families, as well as the reduction in housing units expected as described above. In a similar fashion, the candidate blocks could either show a decrease in crowded housing units more than the study area average, or meet one of two similar criteria: either a decrease in total population greater than the study area rate or a decrease in the total persons per room greater than the study area rate. By meeting one of these three measures, a decrease in population density is exhibited.

In summary, the definitive delineation of gentrification occurring in the study area requires that candidate blocks meet four distinct criteria. These include: a five percent or more decrease in African-American population percentage; an increase in average rent greater than the study area increase; meeting one or more of three criteria designed to measure changes in the structure of housing units; and meeting one or more of three criteria measuring a decrease in population density. Table 4 summarizes the formula for this definition of gentrifying blocks in the study area. A total of 82 blocks, whose locations are shown in Map 8, met these requirements. The block level delineation was used to identify tracts experiencing gentrification. Tracts containing two or more blocks showing gentrification activity were identified as gentrifying. These tracts served as the comparison set to evaluate tract-level delineations. In comparison, Map 6 shows a close match with the control data set based on racial change only. All

16 tracts with two or more blocks of gentrifying activity also show multiple blocks of significant African-American-to-European-American racial transition and would, therefore, also be identified as gentrifying on a racial change criterion only. It's noteworthy that seven additional tracts would be identified as gentrifying if the racial change criterion (Map 6) was the only measure. This may indicate that the definitive delineation adopted in this study is conservative and may be somewhat undercounting the extent of gentrification and/or that any tract level delineation is likely to be misleading. A discussion of the spatial pattern of gentrification observed follows.

THE SPATIAL PATTERN OF GENTRIFICATION

In the western portion of the study area, several interesting patterns are evident. The two southernmost superblock cores in the corridor between Lowerline Street and Carrollton Avenue are clearly under assault by gentrification. Located in tracts 125, 126 and the southern edge of 127, multiple blocks in the transitional area between the all-European-American fringe and the predominantly African-American interiors of these two superblocks show clear evidence of neighborhood change. At the same time, only a few blocks show a significant increase in their African-American population percentage (see Map 6). Obviously, strong evidence of gentrification is indicated in these three census tracts, and the process is clearly not random. It is focused on the mixed transition zone that surround the African-American residential cores of these superblocks.

The other superblock located in this corridor (contained within the northern portion of tract 127 and the southern edge of tract 128) shows the opposite trend. While

a few blocks on the outer fringes of this superblock show significant evidence of gentrification, they are far outpaced by the number of blocks which experienced significant increases in their African-American population component (see Map 6). The racially mixed transitional blocks of this more northern superblock became substantially African-American by 1980, and the transitional zone was displaced outward into blocks that were predominantly European-American in 1970.

The other trend displayed in this portion of the study area is the eastward expansion of the African-American residential core from its 1970 concentration on the western edge of the uptown area. Census tracts 129, 130, 132, 75.02 and 72 show a clear succession of racially mixed blocks in 1970 to predominantly African-American populations in 1980 (see Map 6). This change is most strongly indicated in the northern reach of this corridor. The transitional zone of racially mixed blocks is likewise displaced eastward into blocks that were predominantly European-American in 1970. Contrary to the trend, several blocks of gentrification activity occur in census tracts 129 and 130 along the advancing eastward expansion of this African-American residential area.

As one moves eastward in the study area, similar patterns of racial change define the spatial pattern of gentrification behavior. The southern superblock area located in census tracts 107 and 108 in the corridor between Jefferson and Napoleon Avenues is clearly experiencing gentrification. Multiple blocks in both tracts exhibit the required criteria. Contagious behavior is apparent along Robert Street, the border between the two tracts. The gentrification activity is focused on the western and northern transitional zones of this superblock. While some activity is occurring on the

eastern and southern edges of the mixed zone, it is offset by more blocks showing an increase in African-American population percentage (see Map 6).

Meanwhile, the superblock just north of this area in tracts 109 and 111 is experiencing the expansion of its African-American residential core. With this expansion, the transitional zone of racially mixed blocks is expanding outward. The change from a predominantly European-American to a racially mixed residential zone along the superblock's eastern boundary, Napoleon Avenue, is particularly striking. Some gentrification activity can be seen along the southern boundary of the superblock in the middle of tract 109 as well as two blocks on the western edge of the superblock in tract 111.

Another area in the south central portion of the study area which is undergoing gentrification is tract 101. Along a northwestern-southeastern axis, several gentrifying blocks are spread along a transitional edge. This represents an assault along the southwestern edge of the predominantly African-American Central City area. Interspersed with these changing areas, however, are several blocks undergoing the opposite trend in their African-American population.

Tract 99 shows a similar mixture of racial change. Blocks undergoing gentrification are located in the mixed blocks in the center and eastern portions of the tract. At the same time, an increase in African-American population percentage is occurring along the southern edge of the tract (Magazine Street). Immediately adjacent to this tract is tract 90, the wealthy Garden District area. While several blocks show significant changes in their African-American population percentage, this tract retains its almost exclusively European-American status.

The series of census tracts south of Magazine Street in the central portion of the study area show, for the most part, a significant increase in their African-American population percentages (see Map 6). These included tracts 88, 89, 96, 97, 105 and 106. As a review of Map 8 reveals, however, this transition is uneven; several isolated areas of gentrification are evident in three of the five tracts. The strongest clustering of such blocks is shown in tracts 96 and 88, with evidence also shown in tract 106.

In tract 96, a group of contiguous gentrification consisting of three blocks is found on the eastern boundary of the tract. Just west of this zone, a strong increase in African-American population percentages is noticeable. Tract 88 contains a contiguous corridor of four blocks of gentrification extending into the center of the tract on a perpendicular axis from Magazine Street. This zone, however, is surrounded by blocks showing the opposite trend.

While gentrification is occurring in the south central portion of the study area, the north central area is experiencing a westward expansion of the Central City African-American residential area. This transition is most strongly represented in tract 103, which became predominantly African-American by 1980. Other tracts showing this expansion are 123, 102, and 111.

A final area of gentrification is evident in the eastern end of the study area. Centered on Prytania Street (the boundary between census tracts 78 and 79) in the Lower Garden District is a large clustering of blocks evidencing gentrification activity. The activity is focused on tract 78, but includes the southern portions of tracts 67 and 79. This change is particularly striking in light of the general transition of the adjoining areas to a higher African-American population percentage.

In summary, gentrification is occurring in discrete locales within numerous census tracts throughout the study area. Map 9 shows the tracts which experienced this process as defined by the block level analysis. In order to be identified as experiencing gentrification, the tracts were required to contain two or more blocks of gentrification activity (see Map 8). This shift to census tract level delineation of the process allows for comparison of the results with other tract level analyses.

COMPARING BLOCK AND TRACT LEVEL DELINEATIONS

The first tract level analysis performed in this study was the same test applied in the block level analysis. This resulted in very limited delineation of gentrifying activity. Only tracts 67, 108 and 125 met all four criteria of the definitive analysis. All three tracts were also identified by the block level analysis as experiencing gentrification; however, they represent only 19% (3 of 16) of the tracts identified by the block level study.

The other tract level analysis performed utilized three commonly cited gentrification indicators available for census tracts, but not blocks. These consisted of family income, occupational status, and educational status. Specifically, mean family income, the percentage of professionals and managers of the total employed, and the percentage of persons 25 years and older who had completed 4 or more years of college were analyzed.

A total of 20 tracts were identified which exhibited evidence of gentrification activity (see Map 10). Eleven tracts had increases in all three variables, which exceeds the average increase for the study area. An additional nine tracts met two of the three tests for gentrification.

Comparing these results with that derived from the block level analysis shows a fair level of agreement. Eleven of the 16 (69%) tracts identified from the block level analysis are also characterized as gentrifying with the tract level variables. When the two tracts (67 and 125) from the previous analysis of tract level data are added to the total, an agreement rate of 81% is derived (13 of 16 tracts). While this is impressive, it's important to note that the tract level analysis identifies nine tracts as gentrifying which are not supported by the block level analysis. Thus, the real agreement percentage between the block level analysis and the combined results of the tract level analyses is only 59% (13 tracts in agreement out of 22 identified at the tract level).

Another tract level delineation of gentrification or "renovating" areas in the study area is provided by Laska, et al 1982. This study identified gentrifying tracts by analyzing real estate activity (transfers of property including a structure) as an indirect measure of renovation activity. The results of this research are shown in Map 11.

Comparing these research results with Map 9 shows that their methodology successfully identified all but one (tract 125) of the census tracts identified by the block level analysis employed in this study. This agreement rate of 94%, however, is tempered by the fact that their analysis also indicated that gentrification was occurring in 11 tracts which are not supported by the block level analysis performed in this study. Only 58% of their "renovating" tracts can be supported as gentrifying with the block level analysis of this study.

Locational Variables and Contagion

Also of interest from the 1982 Laska et al study is the locational analyses performed once they had delineated which census tracts were undergoing gentrification.

Their findings can be summarized as follows (Laska et al, 1982:163-164):

- 1) the quality of housing was a good predictor for the existence of renovation activity, the amount of that activity and its timing;
- 2) proximity to historic districts is a weak to modest predictor; and
- 3) traditional locational factors were weak predictors. Industrial and warehouse areas were actually strongly predictive of adjacent renovation activity. Poverty did not appear to be a deterrent in terms of several census data categories (including race, income, education, rent, and crowding of units). The exception to this finding was that public housing projects were strong deterrents to renovation activity.

The central conclusion of their locational analysis was that expectations based upon ecological theory and residential choice theory are not well supported. They conclude that the key to understanding the process of gentrification is the central importance of historically valuable housing stock.

The delineation of gentrification at the block level of study allows for a finer-grain analysis than accomplished by Laska et al. Notwithstanding the inability to review their housing quality assessment, the results of the block level analysis presented above strongly refutes some of Laska et al's other conclusions.⁵ First, the strongest predictor of where gentrification occurred in the 1970's would appear to be the presence of European-American majority residential areas. Map 12 displays the location of gentrifying blocks overlaid on the 1970 map of the study area's racial geography. The vast majority of these blocks (82%) border on solidly European-American residential areas (0 to 19% African-American), and all exhibit limited incursions into African-

American neighborhoods. This finding supports traditional residential location theory by demonstrating the reluctance of gentrifiers to venture far from neighborhoods of comparable race and class composition.

Contrary to Laska et al's findings, racial composition of potential gentrification areas is obviously a primary factor. Solidly African-American neighborhoods are strongly avoided by gentrifiers. Gentrifying blocks cluster along the edges of predominantly African-American residential areas and seem to require close proximity to established European-American neighborhoods as the base for expansion. The contagion model of revitalization is well supported by these findings. Maps 8 and 12 clearly illustrate that gentrifying blocks occur in clusters and in a fairly uniform pattern.

Contrary to Laska et al's findings, the locations of historic districts seem highly predictive of gentrification, at least in the eastern portion of the study area. Map 13 displays the location of historic districts listed in the National Register of Historic Places between 1970 and 1980. These districts include the Garden District (listed in 1971), the Lower Garden District (listed in 1972), and the Irish Channel (listed in 1976). Map 14 shows the location of the two local historic districts created in 1976 by the City of New Orleans. These are the Lower Garden District and the St. Charles Avenue Historic District. Especially strong evidence is shown in the Lower Garden District and the Irish Channel, whose boundaries almost seem designed to circumscribe the areas undergoing renovation.

The overlay of historic districts on the map of gentrifying activity also offers intriguing insights into the issue of the timing of historic district designation in the study area. All the districts existing in the area by 1980 were designated during the 1970's,

the period of study for this research. Thus, the data from the eastern portion of the study area tends to support the view that gentrification occurs contemporaneously with or after district designation.

On the other hand, gentrification occurring in the central and western portions of the study area happened in the absence of such designation. Such designation, however, did take place in the ensuing decade. The Uptown Historic District was listed in the National Register in 1985 and encompassed the gentrifying areas in the central portion of the study area. Listed in 1987, the Carrollton Historic District includes all the gentrifying blocks identified in the western portion. The data from the central and western portions of the study area, therefore, support the view that historic district listings follow on the heels of gentrification. This finding tends to contradict the argument that historic district designation leads to gentrification (see Gale, 1991 for a similar argument).

Finally, public housing projects in the study area served as indirect measures of high incidences of poverty and crime. The locations of the three projects were overlaid on the gentrification maps to examine the relationship between these significant social features and gentrifying activity (see Maps 13 and 14). Three public housing projects are located within the study area: (from north to south) the Calliope, Magnolia and St. Thomas housing projects. Laska et al argue that these projects are definite deterrents to renovators. However, the numerous blocks of gentrification surrounding the St. Thomas project do not support this conclusion. This housing project is even included within the Lower Garden District listed in the National Register of Historic Places. While gentrification does not occur in the vicinity of the other two projects, this seems to have

more to do with the fact that they are located deeply within all-African-American residential areas.

Declining Areas and the Rent Gap Hypothesis

By reversing the criteria utilized to define blocks which were experiencing gentrification (see Table 4), it is possible to identify blocks that are experiencing decline. The declining blocks are defined, then, as those experiencing a five percent or greater increase in their African-American population percentage, a decline in average rent relative to the study area average increase, a declining housing unit structure, and an increase in population density. A total of 216 blocks meet these criteria. Map 15 displays the locations of these declining blocks relative to the location of gentrifying blocks.

Some of the declining blocks occur in census tracts which are clearly undergoing succession into African-American neighborhoods. These occur largely in the northwestern and north-central portions of the study area where no evidence of gentrifying activity is present. However, review of this map reveals that blocks showing decline are often located in tracts which are also experiencing gentrification. In fact, deteriorating blocks sometimes immediately adjoin gentrifying blocks. In other cases, the decline is occurring in adjacent tracts. This observation supports the theoretical position that gentrification goes hand-in-hand with neighborhood decline (Guterbock, 1980).

It's interesting to note that decline seems to be occurring on the outward fringes of gentrifying areas. Two possible explanations are offered here. First, the declining blocks may represent receptor areas for families displaced from gentrifying areas. An

earlier study of displacement from the Lower Garden District indicated that displacees normally end up a few blocks from their previous location (Rosenberg, 1977). The declining blocks on the outer edges of gentrifying areas could then be interpreted simply as the "downside" of revitalization. These negative aspects include increased racial polarization and reduced housing quality for incumbent lower income families.

Another more ominous explanation is that neighborhood decline and disinvestment may actually be a necessary precondition to gentrification. This view is consistent with the rent gap theory, which emphasizes the primary role of capital in the gentrification process (Schaffer and Smith, 1986: 350). The declining blocks on the fringes of revitalizing areas would, under this approach, be interpreted as likely sites of future, though not immediate, gentrification activity.

A final step in the spatial analysis of gentrification in the study area is a further investigation of the issue of rent gap. While residential choice theory adequately explains why gentrifying blocks are located only on the fringes of solidly European-American residential zones, an alternative explanation for the risk involved in edging toward African-American residential areas is needed. The aesthetic quality of historic housing stock may be part of the answer but does not seem sufficient to explain the gentrification of mixed racial zones. The concept of a rent gap provides a possible solution.

The correlation analysis for 1970 and 1980 demonstrated a strong negative relationship between African-American residential blocks and average rent. The strength of this negative correlation actually increased from -0.56 to -0.73 during the decade. This would suggest that historical housing stock in racially mixed zones on the

edges of European-American residential corridors had lower rents (and presumably lower sales prices) than comparable housing in the adjacent European-American areas. This discrepancy created an opportunity for risk-taking households to move into racially mixed areas, get a good value for their housing expenditure, and potentially make a large profit upon resale of the property.

As the relationship between higher rents and lower percentages of African-American population increased during the decade, it seems that the spatial distribution of rent increases may be predictive of future areas of gentrification. Map 16 provides the spatial data on this variable relative to the locations of gentrifying blocks.

CONCLUSIONS

This study presents a methodological issue of major significance —gentrification is a small-scale process and is best examined at a finer scale than census tracts allow. Contrary to Spain's (1992: 132) assertion that block level census data are not adequate to detect the presence of gentrification, we demonstrate that the housing census reports provide sufficient social and housing data to measure changes that are likely to be caused by the process of gentrification. The occurrence of African-American-to-European-American racial change in numerous study area blocks in the context of significant European-American flight for the study area and the City as a whole is a strong indicator of gentrification. When combined with accelerated average rents, a changing housing unit structure and lowering population densities, a conclusive assessment of gentrifying activity is accomplished. Using this combination of data, Map

8 provides a definitive, block level, delineation of gentrification occurring in the study area during the 1970's.

The inadequacies of census tract level definitions of where gentrification is occurring are amply demonstrated in our analysis. In comparing the block level delineation with census tract analyses, the block level of analysis provides a more definitive and fine-grained view of the phenomenon of gentrification. As explored above, relationships between gentrifying blocks and their neighboring blocks are significant for theoretical constructs which attempt to describe and explain the process of neighborhood change. These relationships are largely obscured at the tract level of study.

The application of real estate activity by Laska et al (1982) resulted in the correct identification of all but one of the tracts determined to be gentrifying with the block level analysis employed in this study. The problem with the compatibility of the results is the fact that real estate activity indicated that gentrification was occurring in 11 tracts, which are not supported by the analysis performed in this study. Thus, only 58% of the tracts identified by Laska et al as "renovating" were supported by this study.

The spatial patterning of gentrifying blocks is definitely not random. Maps 8 and 12 clearly display contagious behavior; gentrified blocks tend to cluster together and lie adjacent to established white, middle class areas. Initial pioneers are soon followed by additional gentrifiers in a self-fulfilling expectation of continued social change.

The analysis of locational relationships based upon census tract definitions of gentrification may be severely flawed as illustrated by the Laska et al(1982) study results reevaluated here. Traditional location theory is supported by the limited

excursions of gentrifying blocks into African-American neighborhoods. Immediately adjoining European-American neighborhoods is almost a requirement for gentrifying activity. Additionally, large African-American residential areas are obvious repellents to gentrifying activity. Thus, residential location theory, at least in terms of middle-class whites staying close to home, is strongly explanatory of the pattern of gentrifying activity observed in the study area. The exception to this support is the occurrence of gentrification in close proximity to the St. Thomas housing project. It's obvious that other attractions, not explained by location theory, are at work in the vicinity of this housing project.

Finally, our results are also consistent with rent gap theory, which is evidenced by the close correlation of gentrification activity with accelerating rents and the spatial coincidence of gentrifying and declining blocks. Unanswered, however, is the question of whether decline is a necessary precondition of gentrification or is simply an inevitable byproduct.

Endnotes

1. The study area includes 61 census tracts (1980 census) and a total of 2,401 census blocks. For each block, seven variables were collected and analyzed and the same seven variables, plus three additional ones, were obtained for each census tract. In addition, two census years (1970 and 1980) were included in the study. In total, this involved the collection and analysis of 34,834 observations.

The large scope of the study and the focus on racial geography essentially dictated the use of a computer GIS (geographic information system) program to allow the efficient analysis and mapping of the study area's changes between 1970 and 1980. The GIS program selected for this study was IDRISI, version 4.0, a raster-based geographic information and image processing system.

While IDRISI served as the centerpiece of the analysis performed in this study, other computer programs were also used at various points of the process. These included Microsoft's Excel for Windows, version 4.0; Inset Systems' HiJaak Pro, version 2.0; Microsoft's Paintbrush included in Windows, version 3.1; and finally Microsoft's Word for Windows, version 2.0.

2. Considering that the study area blocks contain an average population of 76 persons in 1980, racial change of a single three person household on a block would result in a 4% change in the block's African-American population. Since a 10% change in an average block would represent a racial change in several households, this was selected as the threshold for significant racial change.
3. The 5 percent threshold was selected because it represents a net racial changeover of at least one household in the typical block.
4. With the exception of the racial variable, all changes in variables were indexed to the average change for the study area between 1970 and 1980. For example, the average rent for the study area increased 122% over the decade; only blocks with average changes greater than 122% were identified as potentially gentrifying.
5. Unfortunately, the central variable of their analysis, historically valuable housing, is not easily evaluated. As stated in their article (Laska et al, 1982:159), the architectural quality of housing in each tract was evaluated on a four-point scale by a panel of architects. Two problems prevent the use of their evaluation in our analysis. First, the results of their rating system are not provided in the article. Second, and more importantly, the architectural ratings were assigned at the census tract level.

Application of tract level architectural ratings is inherently flawed in the study area due to the high degree of variability in housing quality. As Lewis (1976: 44-46) demonstrates, the presence of numerous "superblocks" in the study area results in multiple, small-scale, concentric patterns of race and housing quality. This pattern results in mansions along the major boulevards grading quickly into working class structures in the core of the superblocks. Census tract boundaries generally follow the

major boulevards and, thus, contain both high status housing along their peripheries and lower status housing in their interior. A tract-average ranking obscures this broad variability and, therefore, has little value for a block level scale of study.

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