

Population Review

Volume 49, Number 1, 2010

Type: Article pp. 53-81

Ethnic Diversity in Houston, Texas: The Evolution of Residential Segregation in the Bayou City, 1990-2000

Authors: John B. Strait and Gang Gong

Affiliations: Department of Geography and Geology, Sam Houston State University (Strait); Department of Geography and Geology, Sam Houston State University (Gong)

Corresponding author/address: John B. Strait, Department of Geography and Geology, Sam Houston State University, P.O. Box 2148, Huntsville, TX 77341; E-mail: JBS008@SHSU.EDU

Abstract

The increased racial and ethnic diversity in the United States has been shown to alter significantly the residential landscapes within urban areas. This research investigates the impacts that an increase in diversity has had on the levels of residential segregation among racial and/or ethnic groups in Houston, Texas from 1990 to 2000. Empirical analysis entailed the measurement of two dimensions of segregation evident among Non-Hispanic whites, African-Americans, Hispanics and Asians. Measures of residential exposure were decomposed in order to investigate the relative impacts of metropolitan-wide compositional change and intra-urban redistributive change on segregation among the four groups. During the 1990s, all non-white groups became increasingly segregated from whites and increasingly integrated with one another. Results suggest that both whites and Asians exhibited some degree of “ethnic (or racial) self-selectivity” that functioned to concentrate these groups residentially, although these forces were partially overwhelmed by other redistributive and compositional changes. The evidence further suggests that the degrees of segregation experienced among minorities were strongly impacted by the residential behavior of whites.

Keywords

Race, ethnicity, residential segregation, diversity

Introduction

Urban areas in the United States have long been noted for exhibiting high levels of racial and ethnic segregation. Despite the passage and enforcement of fair housing laws, racially segregated neighborhoods continue to be the norm rather than the exception. Substantial scholarly research has focused on the degree to which racial and ethnic groups reside in separate urban neighborhoods, and has also attempted to identify both the causes and implications of this phenomenon (Clark 1986; Sampson et al. 2005; Strait 2006a; Strait, Gong and Williams 2007; Kwate 2008). The bulk of this literature has emphasized a binary or “bi-racial” approach, focusing primarily on the residential separation between Non-Hispanic whites and African-Americans. This is particularly true in regards to studies focused on segregation within the U.S. South, a region traditionally viewed with a bi-racial lens (Strait, Gong, and Williams 2007). The reasoning for such emphasis is simple: these two racial groups have historically comprised most of this country’s population, and the highest levels of residential separation have consistently existed between them (Massey and Denton 1993; Farley and Frey 1994; Farley 1996, 1997; Glaeser and Vigdor 2001; Frey and Myers 2005). Residential landscapes, however, like most urban phenomena, have evolved considerably over time in response to a host of economic, demographic, geographic and social processes. One process that has significantly impacted residential landscapes in recent years has been the increased racial and ethnic diversity evident among urban populations. As a result of this process, the “chocolate city, vanilla suburbs” phenomena has ceased to apply to most large urban areas in the U.S. (Farley et al. 1978, 1993; Strait 2006b; Strait and Gong 2008). Residential landscapes continue to function as the lynchpin for social relations in the United States and elsewhere, thus understanding these evolving patterns of segregation remains imperative.

By focusing on residential segregation within Houston, Texas, this research explores the impact that increased racial and ethnic diversity has had across a rapidly growing and rapidly diversifying urban area. This paper investigates changes in the levels of segregation exhibited during the 1990s among four major racial and/or ethnic groups in the Houston metropolitan area: African-Americans, whites, Hispanics and Asians.¹ The overall purpose of this paper is to address the following specific questions: (1) What are the relative levels of segregation experienced among these four groups in Houston and how have they changed over time? (2) What forces are driving the changes in segregation exhibited among the four groups? (3) How do the impacts of these forces on segregation vary by race and ethnicity? In addressing the last two questions, this paper investigates the possibility that certain racial and/or ethnic groups may exhibit residential behaviors that lead them to be more or less “clustered” over time.

Background

Conceptual Framework

This analysis involves the measurement and identification of two different manifestations of segregation: *residential evenness* and *residential exposure*. Residential evenness is the form of segregation more commonly focused upon and generally refers to the degree to which members of different groups are over-represented and under-represented in different sub areas relative to their overall proportions in a larger population (Massey and Denton 1988; Massey et al. 1996). This research documents levels of residential evenness evident in Houston, yet we also utilize a measure of residential exposure as a means to examine the nature and magnitude of two different processes that directly influence the degree to which racial and ethnic groups actually *experience* segregation (Holloway et al. 1999; Strait 2001, 2002, 2006b; Strait, Gong and Williams 2007). These two forces—metropolitan-wide compositional changes and intra-metropolitan-scale redistributive changes—operate at different scales and can potentially impact levels of segregation in different ways. First, the relative composition of different racial and/or ethnic groups residing within a metropolitan area may change simply due to overall population change. For example, if

an urban area experiences a significant increase in members of group X, we would expect all other populations residing within that area to become increasingly exposed to members of this group. Thus, residential integration could occur over time as a result of a metropolitan-wide *compositional* change. In addition to such a metropolitan-wide process, neighborhood-level redistributive processes may also impact levels of segregation. In this instance, a metropolitan area may become increasingly integrated if members of Group X relocate to neighborhoods formerly and strictly inhabited by other populations. However, this integrative process may be mitigated, or even overwhelmed, if other groups are relocating from such neighborhoods at the same time. In either scenario, levels of segregation could be impacted due to intra-metropolitan redistributive forces, without any form of metropolitan-wide compositional change occurring at all. This study utilizes a measure of residential exposure to investigate the relative impacts of both compositional and redistributive forces on the residential experiences of different racial and ethnic groups in Houston.

Previous Research

Evidence generated from 2000 census data demonstrates that residential landscapes are in the process of evolving in terms of the relative distributions of the four major racial and ethnic groups. A number of scholars attribute these changing patterns to recent immigration trends (Zhou and Logan 1991; Boswell 1993; Boswell and Cruz-Baez 1997; Zhang 1998; Charles 2000, 2001; Grant 2000; Strait 2002, 2006b; Clark 2003; Newbold 2004). It has been consistently shown that African-Americans still experience more residential segregation than any other racial and/or ethnic group, although African-American/white segregation did decline modestly during the 1990s (Glaeser and Vigdor 2001; Logan, Stults, and Farley 2004). Notable shifts are evident nation-wide, however, in the degrees to which Asians and Hispanics share neighborhoods with African-Americans and whites, respectively. In short, this evidence suggests that both Asians and Hispanics are becoming increasingly *integrated* with African-Americans while becoming increasingly *segregated* from whites (Logan, Stults, and Farley 2004; Strait, Gong and Williams 2007). At the same time these two groups have become increasingly concentrated within racial and ethnic enclaves, and are becoming slightly more integrated with one another.

It is generally believed that the increased isolation of Asians and Hispanics from whites partially stems from the rapid growth of new immigrant groups among these minority populations (Farley and Alba 2002; Logan, Stults, and Farley 2004; Strait, Gong and Williams 2007). According to this notion, new immigrants face unique situations in terms of language and job skills that encourage the development of group-specific social networks. For example, Zhou and Bankston (1998) have demonstrated that maintaining networks in an ethnic community can provide benefits to immigrants newly immersed into a host society. The formation of residential “enclaves” is thought to represent a natural mechanism to facilitate such networks. The tendency for immigrant populations to place very strong emphasis on ethnic affiliation when making residential decisions—a process referred to as “ethnic (or racial) self-selectivity”—has been widely investigated (Gordon 1964; Cooney and Contretas 1978; Winsberg 1979; Aquiree, Schwirian, and La Greca 1980; Massey and Eggers 1990; Clark 1991; 2002; Boswell and Cruz-Baez 1997; Charles 2001; Strait 2002, 2006b; Strait, Gong and Williams 2007). The wide variety of findings and interpretations generated from these research efforts have been quite mixed, suggesting that the tendency for racial or ethnic groups to exhibit self-selectivity is highly contingent on context.

A small, yet growing, literature has directly or indirectly investigated the nature of “self-selectivity” by focusing on the relative impacts of the aforementioned intra-metropolitan redistributive forces (Holloway, et al. 1999; Strait 2001, 2002, 2006b; Strait, Gong and Williams 2007). It is noteworthy that some of these studies failed to investigate the residential experiences and impacts of all major racial and ethnic groups.² Studies focused on poverty concentration among African-Americans and whites in Columbus, Ohio and Atlanta found no evidence that African-Americans exhibited self-selectivity during the 1980s (Holloway et al. 1999; Strait 2001). Rather, in both contexts this minority population made residential moves that over time would have integrated them with whites. A similar study focused on poverty

concentration within Miami, Florida found no evidence of self-selectivity among either African-Americans or Hispanics during the same decade (Strait 2002). All three of these aforementioned studies were limited in that they failed to investigate the residential experiences of Asians. More recent studies of Los Angeles and New Orleans incorporated analysis on all four main racial and/or ethnic groups during the 1990s and do provide some evidence that both Asians and Hispanics exhibited self-selectivity (Strait 2006; Strait, Gong and Williams 2007). In sum, the results generated from this literature have been informative, although with the exception of the study of New Orleans, the primary purpose of this literature was to investigate factors responsible for poverty concentration, not segregation per se. To date, little research has directly analyzed the role of self-selectivity as a redistributive force in a study focused explicitly on racial segregation within a truly diverse, multi-ethnic urban area.

The Relevance of Houston, Texas

An analysis of Houston is particularly relevant to the contemporary study of racial segregation for three important reasons. First, it is one of the most ethnically and racially diverse urban areas in the U.S. As a result of immigration, the United States as a whole has recently shown a rapid increase in the number of truly multiethnic urban areas. Few urban areas, however, have been impacted by immigration as significantly as Houston. During the 1990s Houston emerged as a member of the select group of large U.S. cities classified as “minority-majority” cities, along with Los Angeles, Chicago, and New York.³ By 2000 Houston’s non-Hispanic white population was surpassed in absolute and relative terms by its “minority” population across the entire *metropolitan area*. Like most other U.S. urban areas, particularly those in the southwest, Houston’s population was significantly impacted by immigration from Latin America. However, it also stands out from most other urban areas because of its rapidly growing and diversifying Asian population. For example, Houston contains the country’s second largest Vietnamese population, and is also home to rapidly emerging South Asian Indian and Chinese communities (Houston Chronicle 2007).

Previous research on the neighborhood-level dynamics of Houston highlights a second reason why Houston offers an intriguing case study for the study of residential segregation. Recent study of poverty concentration within Houston, while not focused on the potential impacts of redistributive or compositional forces, does strongly suggest racial segregation plays a role in the degree to which different groups actually experience neighborhood poverty (Strait and Gong 2008). In short, findings generated from this research suggest that African-Americans are more exposed to “extreme” neighborhood poverty than other groups, partially because they are more likely to be more residentially isolated from other Houstonians. While poor African-Americans remain disproportionately concentrated in a few very poor neighborhoods, the remaining poor populations are distributed far more widely across the greater Houston area. More broadly, this research also suggests that changes stemming from the evolving racial and ethnic dynamics occurring within Houston are evident at the neighborhood scale (Strait and Gong 2008).

A third reason Houston functions as an excellent case study relates to the fact that it is one of the most rapidly growing urban areas in the United States (Combs 2005; Gilmore 2004; Bureau of the Census 2006). A number of urban areas within the southern and western regions of the United States exhibited considerable growth during the last few decades, yet few have grown as rapidly as Houston. The Houston Consolidated Metropolitan Statistical Area (CMSA) added close to a million residents during the 1990s alone and by 2000 had emerged as the 10th largest metropolitan area in the country (Bureau of the Census 1990; 2000). Unlike the central cities of most other large urban areas, the *central-city* of Houston was not immune to such rapid population growth. In fact, Houston’s central city grew more than many metropolitan areas during the decade (Bureau of the Census 1990; 2000; Strait and Gong 2008). Thus, the context of Houston varies considerably from that of the core other urban areas, such as Chicago, where evolving levels of racial and ethnic segregation were significantly influenced by central-city population loss and middle-class flight (Greene 1991, 1994; Jargowsky 1997). In short, a focus on

Houston potentially offers a glimpse of how residential dynamics operates within a rapidly growing and increasingly diverse North American metropolis.

Data and Methodology

Data used in this paper were derived and tabulated from the 1990 and 2000 census tract files for the seven counties that comprise the Houston-Galveston-Brazoria, Texas CMSA as defined in 1990.⁴ Throughout the remainder of this paper this broad metropolitan unit will simply be referred to as “Houston.”⁵ This study measured two different dimensions of segregation and required the use of two separate indices. The commonly used *Index of Dissimilarity (D)* was used to measure residential evenness. Conceptually, *D* is interpreted as reflecting the percentage of either group’s population that would have to change neighborhood residence in order for the group to become evenly distributed across a larger area relative to another group.

The second index of segregation utilized, often referred to as the exposure, isolation or interaction index, was used to gauge levels of residential exposure. Used here, the concept of exposure refers to the potential level of residential contact that different racial or ethnic groups share with one another. Unlike indices of residential evenness, such as the index of dissimilarity, this index measures the degree to which a member of a particular group actually *experiences* segregation within their residential environment. For instance, the exposure index measures the extent to which groups share common neighborhoods. Unlike the index of dissimilarity, it strongly depends on the relative sizes of the groups being considered (Massey 1985; Massey and Denton 1988; Massey et al. 1996). Two distinct forms of the exposure index are utilized. One form of the index, referred to as the isolation index, is interpreted as indicating the probability that an average member of a specific population would have residential contact with other members of the same population within their neighborhood environment.⁶ Thus, for the purpose of this paper, increased isolation or concentration refers to the process whereby members of a particular ethnic or racial group come to reside in neighborhoods inhabited by relatively larger numbers of the same group. For example, this index could be used to calculate the proportion of the total population residing with the average Asian’s neighborhood that is also Asian. A related form of this index is used to measure the probability that an average member of a specific population will have residential contact with, or residential exposure to, members of a different group. This index can then demonstrate the proportion of the population residing within the average Asian’s neighborhood that is African-American. Collectively these indices essentially provide the demographic breakdown of the neighborhood inhabited by average members of the particular racial or ethnic groups being considered.

One benefit realized from utilizing these exposure indices is that they conceptually and empirically reflect the combined effects of overall population composition and the relative spatial distributions of different sub-groups (Holloway et al. 1999; Strait 2001, 2002, 2006b; Strait, Gong, and Williams 2007). Thus, by considering changes in these indices over time, it is possible to demonstrate the relative impacts of metropolitan-wide compositional forces and neighborhood-level redistributive forces on the degrees to which different racial and ethnic groups are isolated from or exposed to one another residentially. It is further possible to decompose changes in these indices, thus demonstrating relative influences of group-specific forces (for a more thorough description of the decomposition of these indices see Holloway et al. 1999 and/or Strait 2001).⁷ For instance, it is possible to determine the specific impact that the redistribution of Hispanics has had on the residential isolation of African-Americans. In short, by demonstrating the relative distributions of specific populations at different time periods, it is possible to use this method of decomposition to estimate the outcomes of migratory behavior exhibited among the various groups.⁸

Results of Analysis

Changes in Residential Evenness

Data in Table 1 clearly demonstrate the growing diversity evident within Houston's population during the course of the 1990s. All three minority groups grew more rapidly than did whites. The relative and absolute increases in both Hispanics and Asians were especially notable. Testament to the significant impact of immigration realized in the region, over 65% of the Houston's population growth during the decade was accounted for by Hispanics (Table 1). Table 2a includes a segregation matrix showing measures of evenness evident among the four groups as measured by the index of dissimilarity for both 1990 and 2000. For comparative purposes, Table 2b includes average measures of the same indices for a sample of the 50 largest metropolitan areas in the United States (Logan, Stults, and Farley 2004). The data indicate that a similar segregation continuum exists in Houston compared to other metropolitan areas, yet in Houston all three minorities became more segregated from whites during the decade. As is the case elsewhere, in Houston African-Americans were more segregated from whites than other groups. Hispanics exhibited intermediate levels of segregation, while Asians were only modestly segregated from whites.

Table 1. Population Change Among Racial and Ethnic Groups in the Houston (TX) Metropolitan Statistical Area, 1990 - 2000

	1990	2000	Change	% Change
Total MSA population	3,677,328	4,550,328	873,538	23.76
White population	2,130,095 (57.9 %)	2,200,271 (48.3 %)	70,176	3.29
Hispanic population	750,589 (20.4 %)	1,319,582 (29.0 %)	568,993	75.81
African-American population	654,003 (17.8 %)	750,589 (16.5 %)	96,586	14.77
Asian population	129,883 (3.53 %)	220,124 (4.8 %)	90,241	69.51
Other groups	12,758 (0.3 %)	62,610 (1.4 %)	49,852	390.75

Changes in Residential Exposure

Table 3 lists measures of residential exposure exhibited by the four groups as measured by both the isolation and exposure indices for 1990 and 2000. These indices are influenced by changes in the relative group compositions, so they would be expected to change over time. To some degree these changes reflect the increased diversity evident region-wide, but they also reinforce the fact that whites in Houston still tend to reside in separate neighborhoods from racial and ethnic minorities. As would be expected

given the overall compositional change evident during the decade, all groups became significantly more residentially exposed to Hispanics. This growing Hispanic population became numerically significant and increasingly present throughout the majority of the study area during the decade, with the exceptions being the far outer reaches of Montgomery and Liberty counties (see Figures 1 and 2 in appendix). Over the same time period, all groups became less exposed to whites.

Table 2a. Measures of Residential Evenness Among Racial and Ethnic Groups in Houston, Texas, 1990 and 2000 (1990 figures in parenthesis, based on the Index of Dissimilarity)

	Whites	African-Americans	Hispanics	Asians
Whites	X	64.6 (64.1)	52.0 (46.9)	49.4 (47.3)
African-Americans	64.6 (64.1)	X	48.8 (54.8)	58.9 (63.0)
Hispanics	52.0 (46.9)	48.8 (54.8)	X	55.6 (55.4)
Asians	49.4 (47.3)	58.9 (63.0)	55.6 (55.4)	X

Table 2b. Average Measures of Residential Evenness Among Racial and Ethnic Groups in the 50 largest U. S. Metropolitan Areas; 1990 and 2000 (figures from Logan, Stults and Farley 2004; 1990 figures in parenthesis, based on the Index of Dissimilarity)

	Whites	African-Americans	Hispanics	Asians
Whites	X	68.0 (69.9)	54.4 (53.3)	44.2 (43.8)
African-Americans	68.0 (69.9)	X	55.6 (62.8)	66.3 (72.5)
Hispanics	54.4 (53.3)	55.6 (62.8)	X	49.5 (48.4)
Asians	44.2 (43.8)	66.3 (72.5)	49.5 (48.4)	X

In 2000 the average white individual resided in a neighborhood that was 65.3% white, 20.2% Hispanic, 8.5% African-American, and 4.5% Asian. Comparatively speaking, on average all three minority groups resided in more diverse neighborhoods. This was especially true for Asians, who resided in neighborhoods where the racial and ethnic breakdown closely paralleled the metropolitan-wide figures for 2000 (see Tables 1 and 3). On average African-Americans also resided in neighborhoods that were especially diverse, although members of this group remained much more isolated from whites than either of the other groups. This racial minority comprised only around 17% of the overall metropolitan population, yet several neighborhoods in the central portions of Harris County were over 72% African-American (see Figures 3 and 4 in appendix). In fact, the majority of both African-Americans and

Hispanics reside in Houston neighborhoods where they are the numerically dominant group. For example, by 2000 Hispanics resided in neighborhoods where slightly less than half the population (46.1%) was comprised of co-ethnics.

Table 3. Changes in Residential Isolation and Exposure among Racial and Ethnic Groups in the Houston, Texas MSA, 1990 – 2000

	1990	2000	Change	Pct. change
Whites to:				
<i>Whites</i>	0.715	0.653	-0.062	-8.65
<i>African-Americans</i>	0.089	0.085	-0.004	-4.94
<i>Hispanics</i>	0.157	0.202	0.046	29.00
<i>Asians</i>	0.035	0.045	0.010	28.21
African Americans to:				
<i>Whites</i>	0.290	0.249	-0.041	-14.22
<i>African Americans</i>	0.511	0.432	-0.079	-15.45
<i>Hispanics</i>	0.167	0.264	0.098	58.45
<i>Asians</i>	0.030	0.046	0.016	53.31
Hispanics to:				
<i>Whites</i>	0.445	0.338	-0.108	-24.17
<i>African Americans</i>	0.145	0.150	0.005	3.17
<i>Hispanics</i>	0.376	0.461	0.085	22.66
<i>Asians</i>	0.031	0.041	0.010	32.90
Asians to:				
<i>Whites</i>	0.575	0.450	-0.125	-21.79
<i>African Americans</i>	0.152	0.157	0.005	3.35
<i>Hispanics</i>	0.179	0.247	0.068	37.86
<i>Asians</i>	0.091	0.124	0.034	36.89

Decomposition of exposure indices

Table 4 lists results of the decomposition of the changing levels of residential isolation and exposure into redistributive and compositional components. These data show the independent effects that both overall metropolitan-wide forces and neighborhood-level redistributive forces had on segregation levels among the four groups. The residential experiences of Houstonians were generally more impacted by broader, metropolitan-scale changes than they were by neighborhood-level redistribution. For instance, redistributive changes collectively functioned to increase the exposure of whites to one another by 1.0 % during the decade. Those same redistributive forces would have *decreased* the exposure of whites to

Hispanics by just under 2 % (0.0196). However, these respective neighborhood-level impacts were largely overwhelmed by metropolitan-wide demographic changes, resulting in whites becoming less exposed to one another and increasingly exposed to Hispanics. Aggregate compositional change across the metropolitan area decreased the exposure of whites to other whites by over 6% (-0.0639). These same metro-wide changes *increased* the exposure of this population to Hispanics by over 6.5% (.0651). It is notable that both sets of forces functioned to decrease the exposure of all three minority groups to the white majority.

Table 4. Decomposition of change in measures of residential isolation and exposure

Exposure of:	Total Change (1990-2000)	Due to spatial redistribution	Pct. of total change	Due to aggregate composition change	Pct. of total change
Whites to:					
<i>Whites</i>	-0.062	0.010	-16.16	-0.064	103.23
<i>Afr. Americans</i>	-0.004	0.000	-2.27	-0.005	102.27
<i>Hispanics</i>	0.046	-0.020	-43.08	0.065	143.08
<i>Asians</i>	0.010	-0.004	-44.44	0.014	144.44
Afr. Americans to:					
<i>Whites</i>	-0.041	0.000	0.24	-0.041	99.76
<i>Afr. Americans</i>	-0.079	-0.053	66.67	-0.026	33.33
<i>Hispanics</i>	0.098	0.038	38.77	0.060	61.23
<i>Asians</i>	0.016	0.005	33.54	0.011	66.46
Hispanics to:					
<i>Whites</i>	-0.108	-0.033	30.30	-0.075	69.70
<i>Afr. Americans</i>	0.005	0.022	467.39	-0.017	-367.39
<i>Hispanics</i>	0.085	0.000	-0.12	0.085	100.12
<i>Asians</i>	0.010	0.000	3.92	0.010	96.08
Asians to:					
<i>Whites</i>	-0.125	-0.044	35.20	-0.081	64.80
<i>Afr. Americans</i>	0.005	0.018	360.78	-0.013	-260.78
<i>Hispanics</i>	0.068	0.002	3.54	0.065	96.46
<i>Asians</i>	0.034	0.002	5.07	0.032	94.93

Table 5. Decomposition of spatial redistributive effects on changes in residential isolation and exposure into specific racial and ethnic components in Houston, Texas, 1990–2000

Exposure of:	Total change (1990-2000)	Change due to spatial redistribution	Group specific redistribution effects			
			Whites	African- Americans	Hispanics	Asians
Whites to:						
<i>Whites</i>	-0.062	0.009	0.019	-0.006	0.022	0.026
<i>Afr. Americans</i>	-0.004	0.000	-0.010	0.017	-0.006	-0.005
<i>Hispanics</i>	0.046	-0.020	-0.020	-0.043	0.034	-0.041
<i>Asians</i>	0.010	-0.004	-0.011	-0.007	-0.006	-0.007
Afr. Americans to:						
<i>Whites</i>	-0.041	0.000	-0.014	0.017	-0.018	-0.013
<i>Afr. Americans</i>	-0.079	-0.053	0.186	-0.054	-0.152	-0.130
<i>Hispanics</i>	0.098	0.038	0.018	0.007	0.016	0.001
<i>Asians</i>	0.016	0.005	0.022	0.014	0.001	0.021
Hispanics to:						
<i>Whites</i>	-0.108	-0.033	-0.024	-0.072	0.067	-0.069
<i>Afr. Americans</i>	0.005	0.022	0.014	0.007	0.004	0.001
<i>Hispanics</i>	0.085	0.000	0.104	-0.136	-0.044	-0.142
<i>Asians</i>	0.010	0.000	0.007	-0.004	0.004	0.004
Asians to:						
<i>Whites</i>	-0.125	-0.044	-0.016	-0.073	-0.064	-0.044
<i>Afr. Americans</i>	0.005	0.018	0.022	0.011	0.002	0.014
<i>Hispanics</i>	0.068	0.002	0.007	-0.026	-0.022	0.004
<i>Asians</i>	0.034	0.002	0.012	-0.013	-0.009	0.045

Decomposition of redistributive forces

Table 5 (previous page) lists the results of the decomposition of redistributive effects into specific components defined by race and ethnicity. These data provide evidence that the impacts of redistributive effects are quite complex and vary considerably by context. Results suggest that both Hispanics and African-Americans made residential relocations that alone would have reduced their spatial isolation and increased their residential exposure to whites. As a result of the redistribution of African-Americans, members of this racial group resided within neighborhoods in 2000 that would be 5.4% “less black” were it not for compositional changes and other redistributive effects. The redistribution of this group would have also functioned to increase the exposure of African-Americans to whites by 1.67%. The redistribution of Hispanics alone would have only slightly decreased the isolation of this group, yet would have functioned to increase the exposure of this ethnic group to whites by over 6.6%. In both cases these group-specific redistributive behaviors were overwhelmed by compositional effects and the redistribution of other groups. Compared to African-Americans and Hispanics, Asians represent an intriguing contrast in that this racial group exhibited redistributive behavior that actually increased the concentration of this group (.0450) and decreased the exposure of this group to whites (-0.0436). In short, this evidence suggests that members of this group seemed to be exhibiting a form of “racial” self-selectivity by redistributing over time into the same neighborhoods. In doing so, they are increasingly segregating themselves from whites.

Perhaps the most notable pattern evident by the data exhibited in Table 5 relates to the effects of the redistributive behavior of the white population. In all cases, the redistribution of this population functioned to directly reduce the residential exposure that minorities have with them. Consequently, the redistribution of whites also increased the exposure of minorities to other minorities. This effect was strong enough that this redistributive force, combined with compositional changes, essentially overwhelmed any integrative effects generated by the minority groups themselves. The collective residential behaviors of whites, African-Americans and Hispanics suggest that a form of “racial/ethnic” transition occurred in Houston during the 1990s. Similar to what was found in Los Angeles, over time whites had become *less* exposed to both African-Americans and Hispanics, even as the redistributions of these minorities were facilitating *increased* exposure to whites (Strait 2006). This dynamic most likely stems from African-Americans and Hispanics relocating from predominantly minority neighborhoods to those that were in the process of being vacated by whites. Data in Table 5 does demonstrate that the redistributive behavior of all three minority groups was promoting a certain degree of integration, but only among the three respective minority groups. The relocations of African-Americans, Hispanics and Asians during the 1990s resulted in all three groups becoming increasingly exposed to one another residentially.

Discussion and Concluding Remarks

This research demonstrates the strong effects that demographic changes have had on Houston’s residential landscape during the 1990s. The state of Texas experienced exceptionally high population growth during the 1990s, and the Houston metropolitan area was situated at the crosshairs of this growth. As has been the case with the state as a whole, the most important factor behind Houston’s population growth has been the strong pace of migration (Peterson and Assanie 2005). Robust employment growth related to the energy industry and the high-tech/telecom boom has drawn a considerable influx of migrants into Houston from both domestic and international sources. The data used here do not distinguish between natural increase or population change related to migration, nor does it allow for a recognition of change due specifically to immigration from abroad. Undoubtedly much of the residential impact in Houston documented by this research stemmed from the continual flow of immigrants into the metropolitan area, with the exceptional growth in Hispanics having the largest impact. The growth of Asians was less influential demographically, yet the residential consolidation of Asian enclaves was certainly palpable. Immigration not only led Houston to become a “minority- majority” city by the end of

the decade, the impacts of this process also transformed neighborhood dynamics across the broader metropolitan region. The influences on segregation levels were shown to operate via two demographic mechanisms: 1) metropolitan-wide compositional change, and 2) neighborhood-level redistribution.

As measured here, residential experiences in Houston were generally more influenced by aggregate compositional influences than by redistributive forces. However, this finding partially reflects the specific methodology utilized, which underestimates the magnitude of neighborhood-level forces (Strait 2001, 2002, 2006b; Strait, Gong and Williams 2007). For instance, some of the compositional change exhibited by Houston during the 1990s would have included the out-migration of people to adjacent suburban or exurban counties not considered part of the metropolitan study area. This “spillover” effect into nearby areas could just as easily be considered a form of redistributive change, as opposed to a form of compositional change. Still, *real* metropolitan-wide compositional changes did impact Houston in significant ways. Moreover, while their magnitude may have been underestimated here, the effects of neighborhood-level forces were still certainly evident. Thus, these results indicate that the nature of racial and/or ethnic segregation can be influenced by separate processes operating at different scales. These results, then, also indicate that immigration, a process described as operating at the global, national and regional scales, also vividly manifests at the metropolitan and neighborhood-levels. The implications of these results are summarized below via three main points.

First, during the 1990s all non-white populations in Houston became increasingly segregated from and less residentially exposed to whites, while becoming more integrated with one another. In terms of the relative levels of segregation exhibited between whites and non-whites, the same segregation continuum exists in Houston that is evident across most of the metropolitan U.S. As is generally the case elsewhere, African-Americans in Houston are overall the most residentially isolated group and are far more segregated from whites than either Hispanics or Asians. Asians remained slightly more integrated with whites than Hispanics. What is different in Houston is not the relative levels of segregation, but the fact that all non-whites were less likely to share residential space with whites by the conclusion of the decade. The extremely high level of segregation evident between African-Americans and whites did not merely persist, it actually increased. A certain degree of integration did indeed occur, but only among the minorities whose redistributive behavior during the decade led them to become increasingly exposed to one another.

Second, empirical results suggest that the various demographic processes occurring during the decade had complex and sometimes contradictory impacts on residential experiences. Neighborhood-level impacts were apparent but were generally overwhelmed by major demographic shifts evident across Houston, especially the substantial metropolitan-wide increase in Hispanics and relative decline in the number of whites. Further, both compositional and redistributive changes were manifested within Houston in racially and ethnically-specific ways. Both African-Americans and Hispanics made residential moves that would have led them to become increasingly exposed to and integrated with whites. However, these integrative forces were overwhelmed by compositional changes and the redistributive behavior of whites themselves. In fact, a traditional “transition” process was evident, with African-Americans and Hispanics relocating to neighborhoods that were being abandoned by whites. Meanwhile, Asians seemed to be shunning integration with whites (at least residentially) and concentrating within their own neighborhoods.

Third, empirical results do provide evidence of ethnic (or racial) “self-selectivity,” at least among Asians and whites. The redistributions of these two groups had strong effects that alone would have increased their residential concentration. Hispanics did become increasingly exposed to fellow co-ethnics during the decade. However, this outcome stemmed from broader metropolitan-wide increases in members of this ethnic group, rather than inter-neighborhood processes. Both the Hispanic and African-American populations in Houston made residential moves during the decade that would have functioned to both reduce their residential isolation and increase their exposure to other racial and/or ethnic groups. Figures

5 and 6 (see appendix) illustrate the geographic manifestation of self-selectivity among Houston's growing Asian population. Two residential enclaves comprised of suburban neighborhoods containing a disproportionately high proportion of Asians are clearly evident. The pre-existing and well-entrenched Asian cluster located along the southwestern portion of the metropolitan core grew both spatially and demographically during the decade. By 2000 a newly emerged Asian district had also materialized along the southeastern corner of Harris County. Thus, the Asian population may very well be increasingly concentrating within Houston's version of what has been referred to as "ethnoburbs" (Li 1998).⁹ The suburban locations of these enclaves may very well be explained by the relatively recent arrival of much of Houston's Asian population and the higher educational and income status of this population. This evidence provides some support for previous research documenting links between the formation of ethnic enclaves and the rapid growth of immigrant populations (Iceland 2004).

What do these research findings tell us about the impact of immigration on residential segregation? Some scholars have argued that increased diversity functions to moderate white vs. black attitudes (Frey and Farley 1996). Others have shown that growing immigrant communities can potentially provide residential "buffers" between African-American and white neighborhoods, ultimately resulting in the increased integration of these two groups (Lee and Wood 1991; Frey and Farley 1996, Iceland 2004). The research reported here provides compelling evidence that this is certainly not true everywhere. Irrespective of Houston's increased diversity, the residential behaviors of white Houstonians continue to mitigate demographic mechanisms that would foster residential integration. Figures 7 and 8 (see appendix) demonstrate that the white population appears to be in the process of essentially abandoning much of Harris County, the central core of the overall metropolitan area (Figures 7 and 8). In short, the interpretations of these results lead to conclusions that may initially appear to contradict one another. In some respects a new residential paradigm seems to be at work in Houston. Increased diversity is indeed leading to certain forms of integration, at least among minorities. The levels of segregation between these minorities and whites, however, have been immune to such integrative effects. In his groundbreaking 1903 treatise *The Souls of Black Folk*, W.E. B. Du Bois claimed that "the problem of the Twentieth Century is the problem of the color line" (Du Bois 1903). Undoubtedly much has changed everywhere, residentially and otherwise, since Du Bois uttered this prescient statement. Yet results of this research indicate that the "color line" remains vividly entrenched in Houston, even as the complexions, ethnicity and distributions among those on one side of that line have evolved considerably.

This research yielded important evidence regarding residential segregation, yet a number of critical questions remain to be addressed. First, a thorough understanding of the findings presented here requires the application of this methodology to a broader range of metropolitan contexts. Patterns and processes related to segregation evident in Houston may not apply everywhere, particularly in urban areas primarily inhabited by African-Americans and whites. For example, would Asians and Hispanics increasingly integrate with African-Americans within urban areas having a significantly larger African-American population? The same processes unfolding within Houston may not be evident within urban areas that are equally as diverse, yet whose immigrant population is less dominated by Hispanics. Would Asians exhibit more or less self-selectivity in urban areas containing a more numerically significant Asian population? Would Hispanics exhibit ethnic self-selectivity in such a context? Second, to date little research has focused on the spatial behavior of specific sub-groups within the Hispanic or Asian populations. Vietnamese, Chinese, Koreans and Indians tend to occupy different economic and cultural niches within urban areas, and would almost certainly exhibit different residential behaviors (Zhou and Logan 1991; Zhou 1992; Chung 1995; Zhang 1998). It is also very probable that compositional and redistributive forces impact the different groups in different ways. The residential experiences of Hispanics also tend to vary by nationality, race and immigration status (Haverluck 1997). In essence, the inherent complexities associated with the ways that racial and ethnic identity interact and spatially manifest across urban space have yet to be fully understood. Finally, this research did not focus on the actual *causes* behind the redistributive processes recognized, nor were specific migrations to specific

neighborhoods directly investigated. The various racial and/or ethnic groups in Houston most likely relocated throughout the metropolitan area in a variety of different ways and for a variety of different reasons. It is very possible that the specific causal factors responsible for the patterns evident on the landscape also varied by race, ethnicity and/or class. Perhaps more importantly, it is also very likely that different groups, or different members of different groups, are impacted in different ways by the outcomes of neighborhood dynamics recognized here. For example, studies of segregation have demonstrated both positive and negative impacts for different groups in different geographies (Zhou and Bankston 1998; Khattab et al. 2010). In summary, racial and ethnic segregation will never be thoroughly understood until the specifics behind “how” and “why” are accurately identified and the implications of spatial arrangements are fully understood. Comprehending the answers to these questions remains critically important, yet they lie beyond the scope and purpose of this paper.

Notes

1. The terminology used in this paper to refer to different racial and/or ethnic groups follows that utilized by the U.S. Census Bureau. According to the U.S. Census, the Hispanic population refers to an ethnic group that includes people having varied racial backgrounds. In popular and scholarly usage, the terms “Hispanic” and “Latino” are often used interchangeably to refer to the same population. The term Hispanic is used here so that consistency may be maintained with the terminology utilized by the primary data source, the U.S. Census. Throughout this paper the term “white” is used to refer to what officially is known as the “non-Hispanic white” population. Likewise, the terms “black” or “African-American” are used here to refer to a non-Hispanic racial group that would not include “Black Hispanics.” The Census recognizes the “Asian” population as a distinct racial group that would include people from a variety of different ethnic backgrounds. Beginning with the 2000 Census, a multi-racial category was available, which allowed individuals to identify themselves as having more than one “racial” background. However, the proportion of the population claiming more than one race is relatively very small, even within environments as diverse as Houston. In order to compare population counts among racial and ethnic groups over different Census years, this multi-racial population was excluded.

The particular categories coded by the U.S. Census may not be the most accurate way to gauge racial and/or ethnic identity. The authors acknowledge the argument that such racial and ethnic categories represent “social constructs” that may have no real biological meaning that can be accurately measured scientifically (Omni and Winant 1986; Winant 1994). This argument becomes particularly relevant when considering the various distinct populations comprising the larger ethnic and/or racial groups labeled “Hispanic” or “Asian” according to the U.S. Census. However, for obvious reasons the methodology utilized here requires the use of such Census-defined categories. Moreover, geographical research, including findings reported in this paper, demonstrate that such categories do indeed have a geographical reality. Thus, given the purpose of this paper, the use of Census-defined categories was deemed both necessary and appropriate.

2. Holloway and his co-authors (Holloway, et al. 1999), and Strait (2001) focused strictly on the residential experiences of African-Americans and whites. Strait, in his investigation of Miami, expanded the focus of analysis to also include the residential experiences of Hispanics (Strait 2002). The more recent studies comprising this literature (Strait 2006; Strait, Gong and Williams 2007) focused on residential experiences among all racial and ethnic groups – whites, African-Americans, Hispanics and Asians.

3. The term “minority-majority” is used to refer to a US jurisdiction, such as a city or state whose racial and ethnic composition is less than 50% white. 'White' in this context means Non-Hispanic whites. Thus, a “minority-majority” city, such as Houston, is a city where the Non-Hispanic white majority is outnumbered by the “minority” population.

4. Census tracts represent geographic regions defined and used by the Census Bureau for the purpose of data collection and presentation at the neighborhood level. As geographic units they represent statistical subdivisions of a county having boundaries that are relatively permanent. Census tract boundaries are delineated such that they can function as geographical proxies for neighborhoods, with the intention of being maintained over a long time so that statistical comparisons can be made from census to census. Boundaries are designed to be homogeneous with respect to population characteristics, economic status, and living conditions.

The U.S. Census Bureau has specific requirements regarding the population size in delineating census tracts, although the criteria utilized may change from census to census to reflect the needs and population growth trends. These units were designed to study neighborhood populations, thus their spatial extent is

based on optimum population size, not geographic size. For example, the 2000 Decennial Census established the following criteria regarding population size in census tract: minimum population threshold: 1,200 (480 housing units); maximum population threshold: 8,000 persons (3,200 housing units); and optimum: 4,000 persons (1,600 housing units) (Federal Register, 2008).

5. In 1990 the Houston-Galveston-Brazoria Consolidated Metropolitan Statistical Area (CMSA) was comprised of 3 distinct Primary Metropolitan Statistical Areas (PMSAs) that collectively included 7 counties; the Houston, Galveston and Brazoria PMSAs. The Houston PMSA included Fort Bend, Harris, Liberty, Montgomery and Waller counties. The Galveston PMSA included Galveston County, while the Brazoria PMSA was comprised of Brazoria County.

The census-defined CMSA for 2000 also included Chambers, Austin and San Jacinto counties. However, for interpretive purposes the methodology utilized for this study required a standardized study area for both 1990 and 2000. For this reason these latter three counties were not considered. Thus, any figures for the 2000 Houston CMSA referenced in this paper only include data for the aforementioned seven counties. The three disregarded counties - Chambers, Austin and San Jacinto counties - were collectively populated by 56, 292 people in 1990 and were classified as non-metropolitan counties at that time. They were also largely non-urban in nature. Their collective populations increased by 27.7% during the decade (71,867 people in 2000), yet they still only accounted for less than 1.6% of the overall population of the Houston-Galveston-Brazoria CMSA in 2000. While their exclusion may cause the analysis to slightly under-estimate redistributive effects – population redistributions to these peripheral counties from core portions of Houston during the decade – we are confident that our overall findings and interpretations are not compromised.

6. The most common formula for the isolation index is the following:

$$xPx^* = \sum_{i=1}^I \left(\frac{x_i}{X} \right) * \left(\frac{x_i}{t_i} \right)$$

where t_i is the total population of tract i , x_i is the number of group-X members in tract i , and X is the total number of group-X members in the largest metropolitan region in question. The measure is interpreted as representing group-X's proportion of the population in the residential tract of an average group-X member. The related *exposure* index is

$$xPy^* = \sum_{i=1}^I \left(\frac{x_i}{X} \right) * \left(\frac{y_i}{t_i} \right)$$

where t_i , x_i , and X are the same terms as before, and y_i represents the number of group-Y members in tract i . This index then measures the potential that an average member of group-X will have residential contact with, or *exposure* to, members of group-Y within their neighborhood environment.

7. The decomposition procedure is based on the following form of the original index, with three hypothetical groups comprising the population of the study area (X, Y and Z):

$$x_{09}Px_{09} = \sum_{i=1}^I (x_{i09} / X_0) * (x_{i09} / t_{i09})$$

where x_{i09} is the number of group X members in tract i in 2000 if they were distributed as they were in 1990, calculated by:

$$x_{i09} = X_0 * (x_{i9} / X_9)$$

where X_9 is the number of group X members in the metropolitan region in 1990, X_0 is the number of group X members in the study area in 2000, and x_{i9} is the number of group X members in tract I in 1990. The 2000 population of tract i if all groups were distributed as they were in 1990 (t_{i09}) was calculated by:

$$t_{i09} = x_{i09} + y_{i09} + z_{i09}$$

with y_{i09} and z_{i09} calculated in the same manner as x_{i09} . The same procedure was used to calculate the amount of change due to the spatial redistribution and computational changes of specific subgroups defined by race and ethnicity.

8. This methodology does not provide a direct measure of specific migration patterns, nor can it determine the specific *cause* of compositional increases among different racial and ethnic groups. However, by demonstrating relative compositions and distributions of specific populations at different time periods, it is possible to use this method to estimate the *outcomes* of both compositional changes and migratory behavior.

9. Li (1998) has described “ethnoburbs” as newer Asian enclaves that exhibit features of both traditional ethnic enclaves and suburbs. Significant numbers of Non-Asians certainly reside in neighborhoods identified from Figures 5 and 6 as Asian enclaves, yet the proportion of the population residing within these neighborhoods that identified as being Asian was over three times the metropolitan average – over 16% Asian.

Appendix

Figure 1. Percent Hispanic 1990

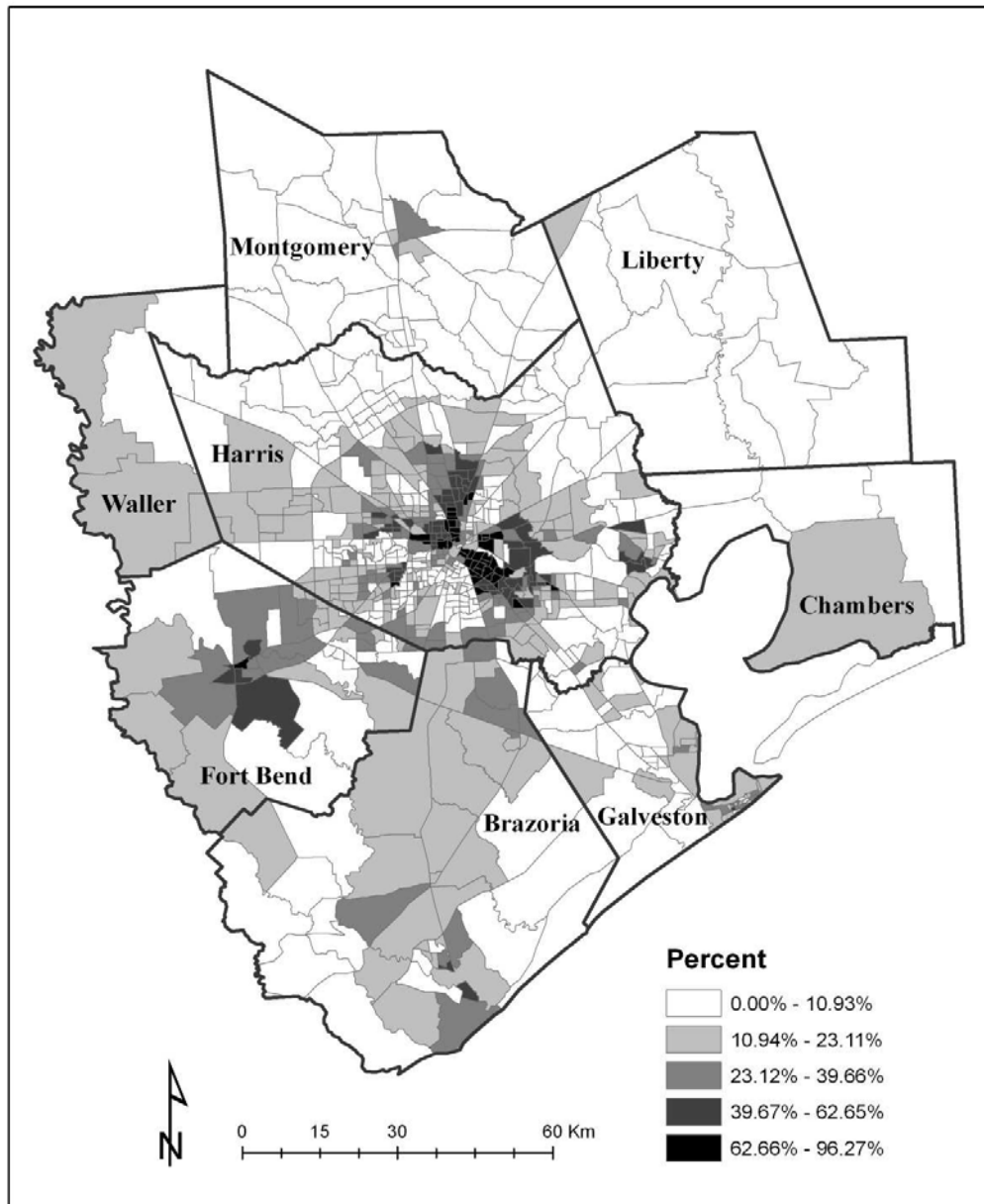


Figure 2. Percent Hispanic 2000

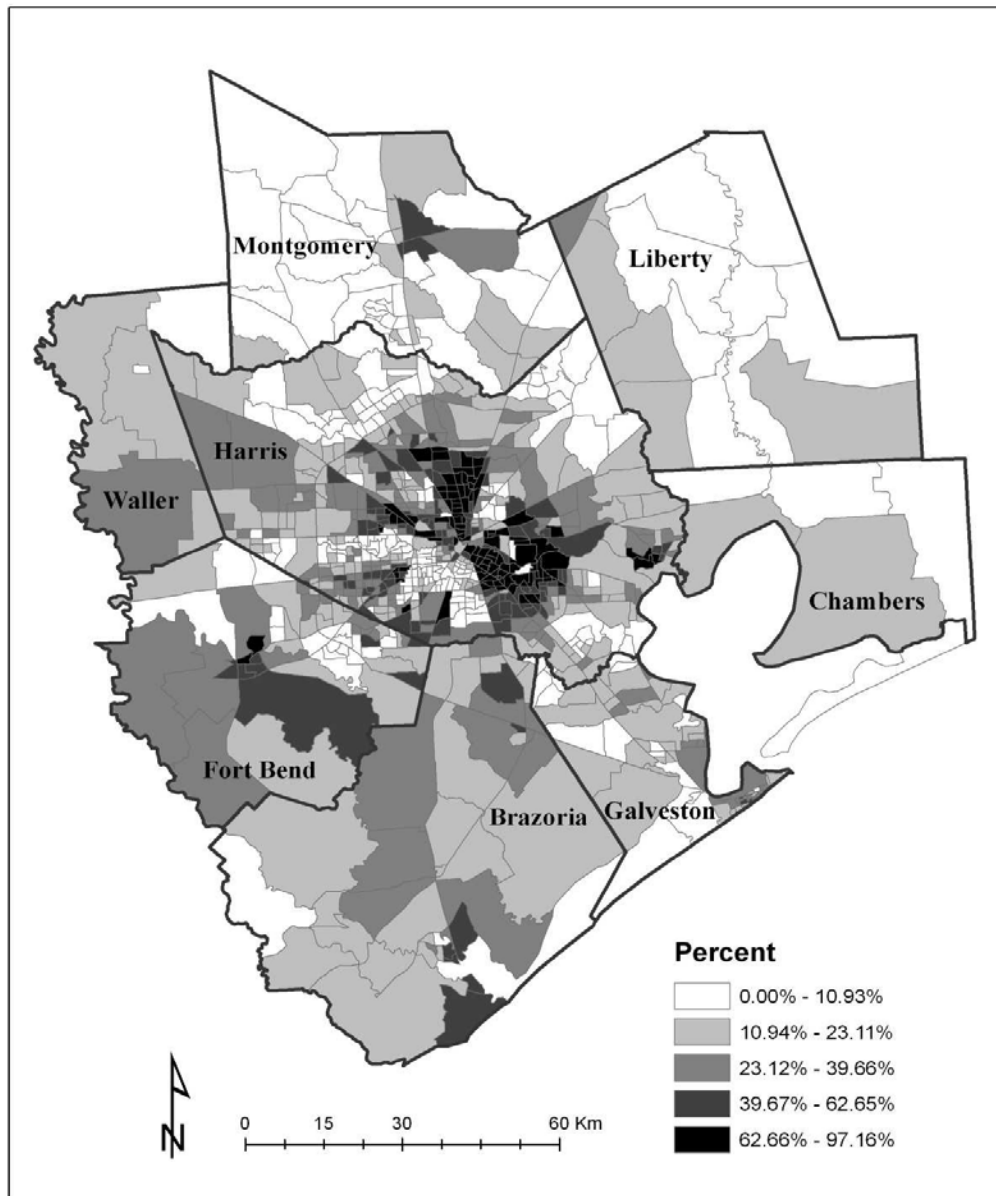


Figure 3. Percent Black 1990

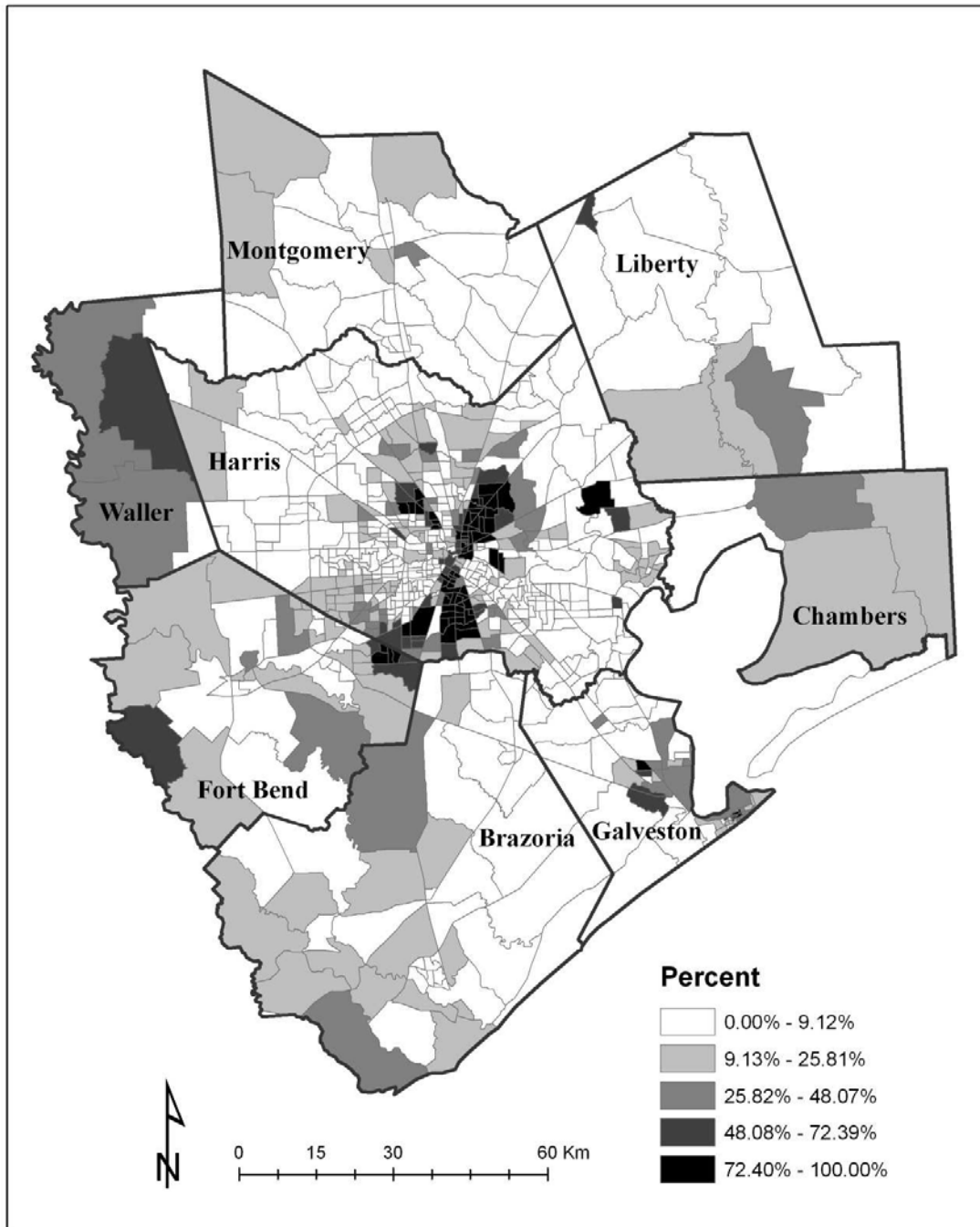


Figure 4. Percent Black 2000

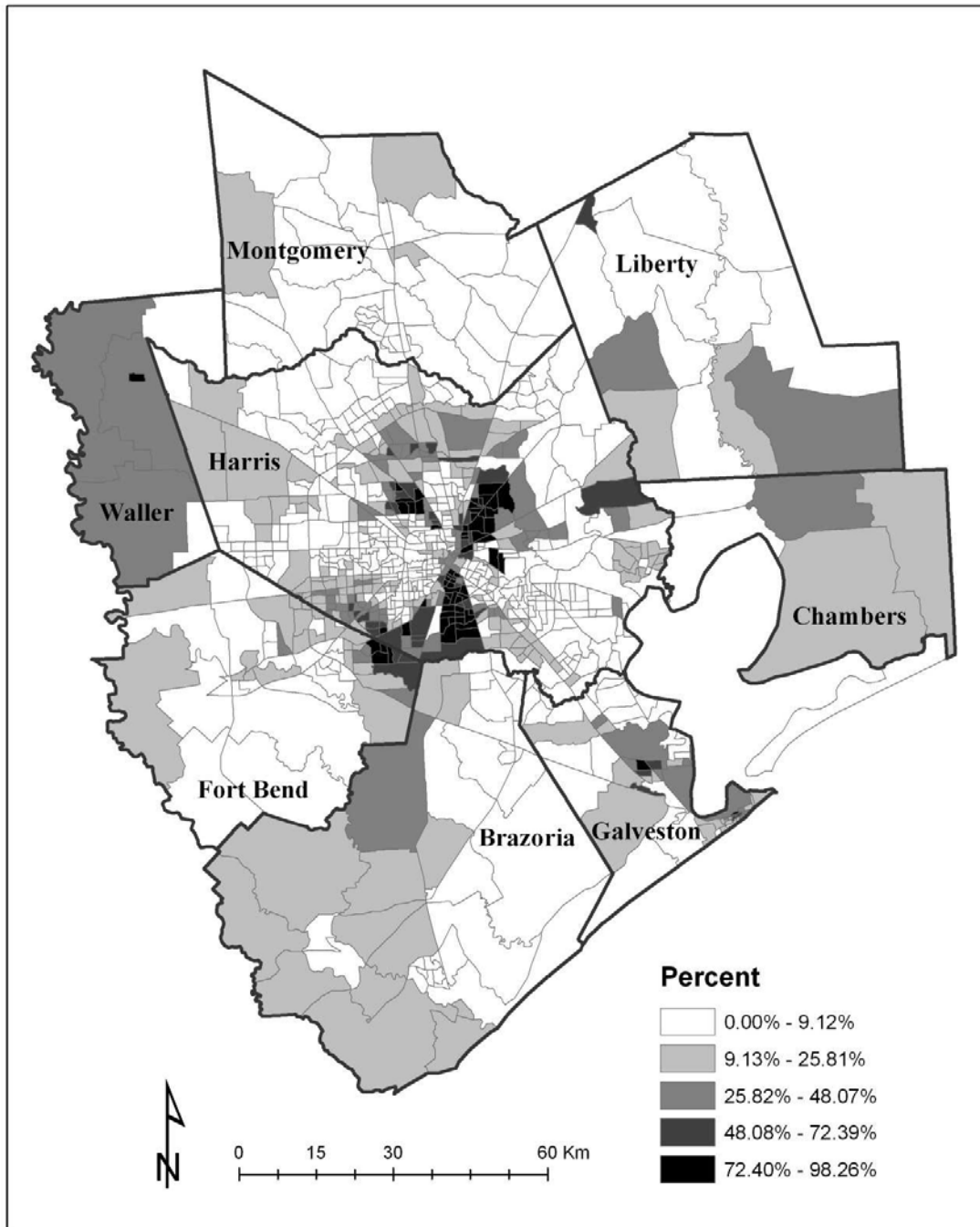


Figure 5. Percent Asian 1990

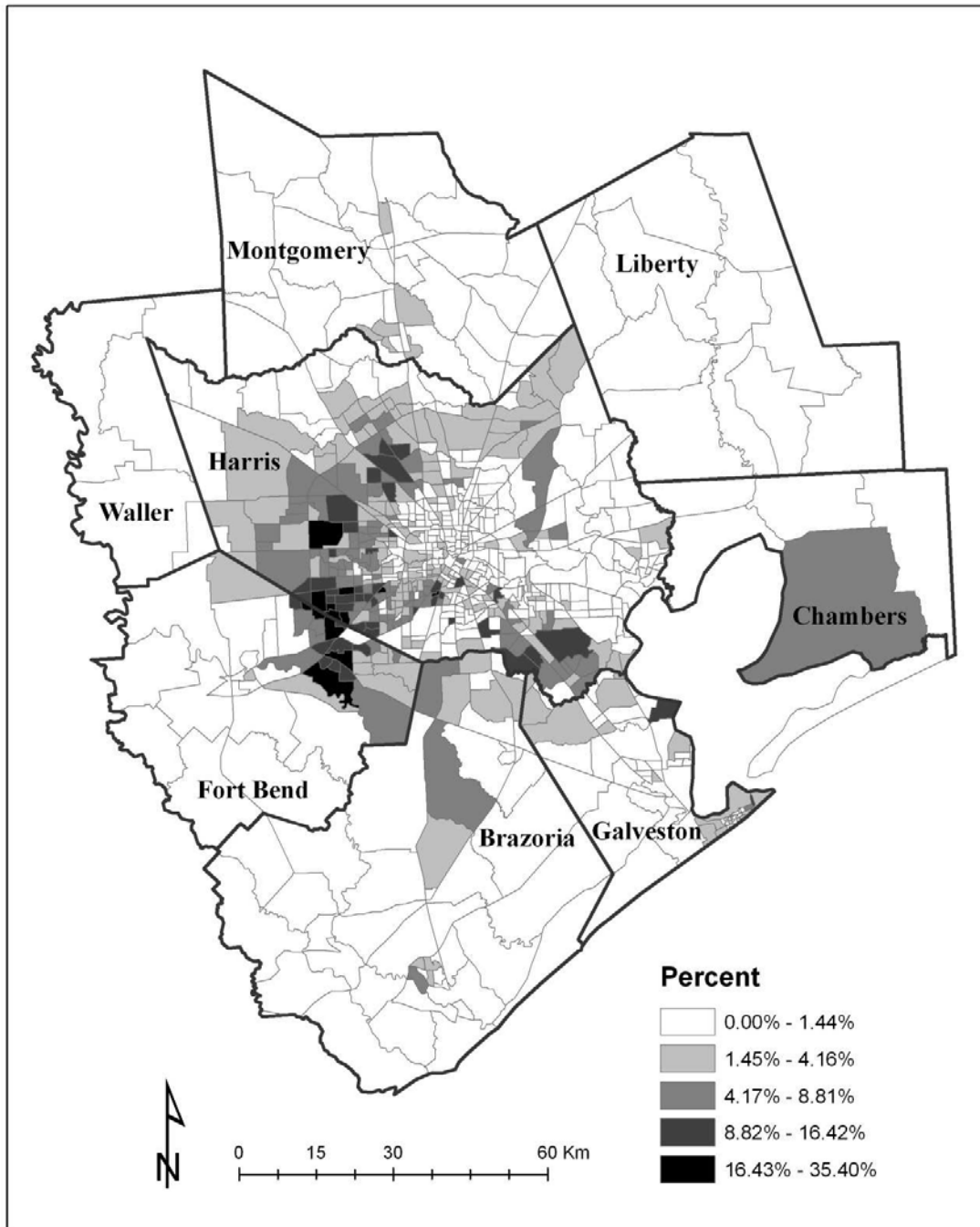


Figure 6. Percent Asian 2000

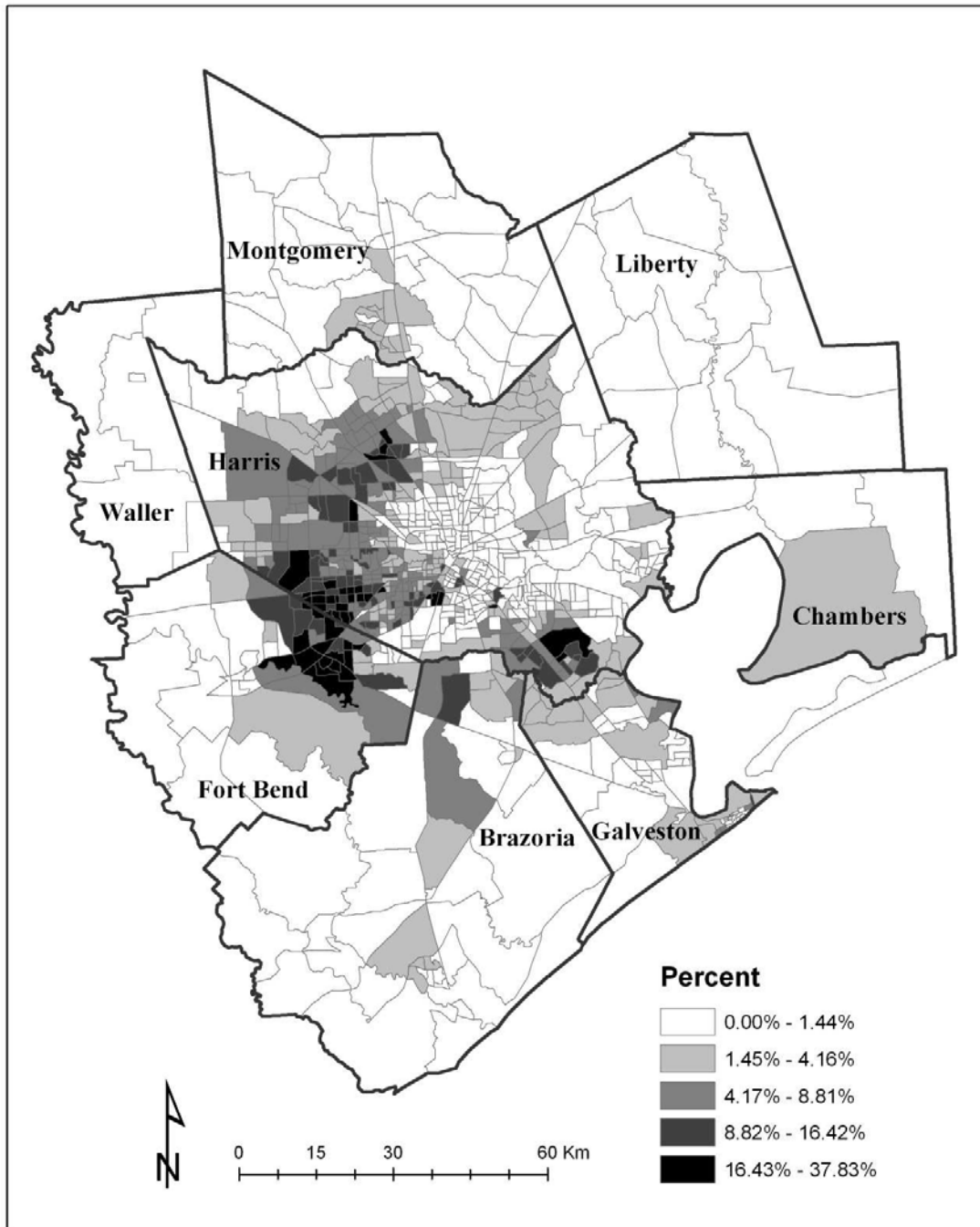


Figure 7. Percent White 1990

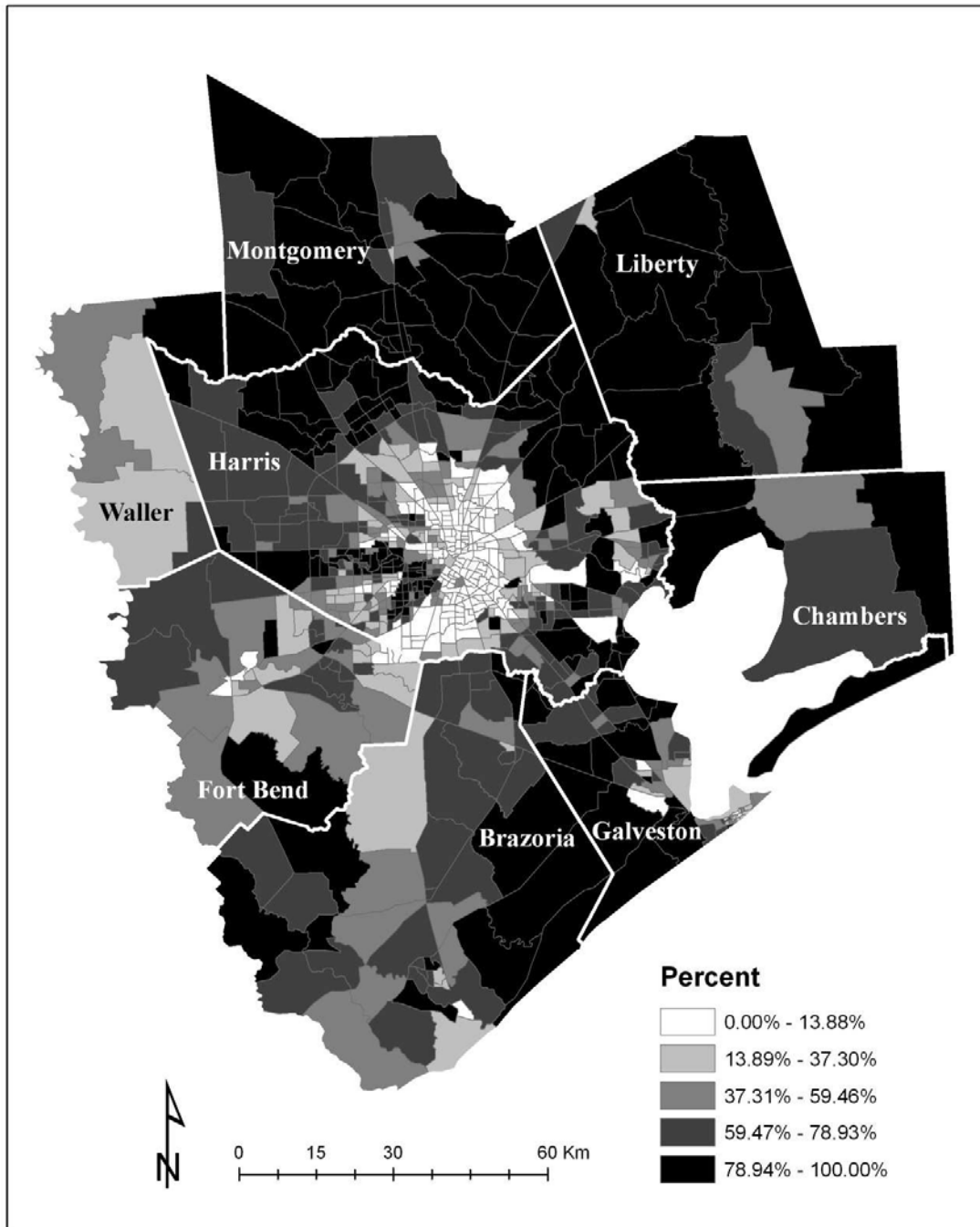
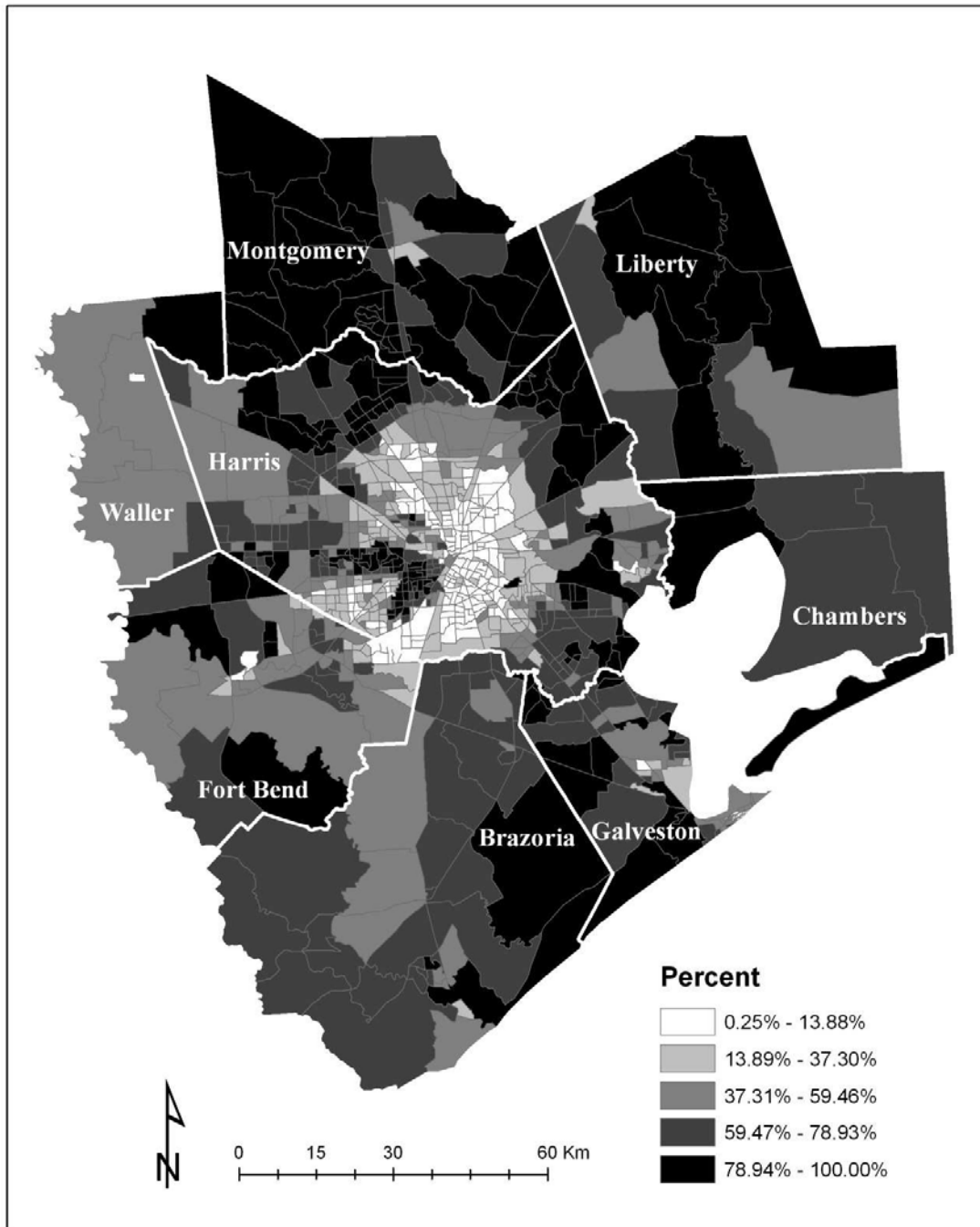


Figure 8. Percent White 2000



References

- Aquirre, B.E., K.P. Schwirian, and A.J. La Greca. 1980. The residential patterning of Latin American and other ethnic populations in metropolitan Miami. *Latin American Research Review* 15:35-63.
- Boswell, T.D. 1993. Racial and ethnic segregation patterns in metropolitan Miami, Florida, 1980-1990. *Southeastern Geographer* 33:82-109.
- Boswell, T.D., and A.D. Cruz-Baez. 1997. Residential segregation by socioeconomic class in metropolitan Miami: 1990. *Urban Geography* 18:474-496.
- Charles, C.Z. 2000. Residential segregation in Los Angeles. In *Prismatic metropolis: Inequality in Los Angeles*, eds. L.D. Bobo, M.L. Oliver, J.H. Johnson, and A. Valenzuela, 167-219. New York: Russell Sage.
- _____. 2001. Processes of racial residential segregation. In *Urban inequality*, eds. A. O'Connor, C. Tilly, and L.D. Bobo, 217-271. New York: Sage Foundation.
- Chung, T. 1995. Asian Americans in enclaves—they are not one community: New models of Asian American settlement. *Asian American Policy Review* 5: 78-94.
- Clark, W.A.V. 1986. Residential segregation in American cities: A review and interpretation. *Population Research and Policy Review* 5:95-127.
- _____. 1991. Residential preferences and neighborhood racial segregation: A test of the Schelling segregation model. *Demography* 28:1-19.
- _____. 2002. Ethnic preferences and ethnic perceptions in multi-ethnic setting. *Urban Geography* 23:237-256.
- _____. 2003. *Immigrants and the American dream: Remaking the middle class*. New York: Guilford Press.
- Combs, H. J. 2005. Supersizing the neighborhood: The McMansion effect in Houston, Texas. *Southwestern Geographer* 9: 24-41.
- Cooney, R.S., and M.A. Contreras. 1978. Residence patterns of social register Cubans: A study of San Juan, and New York SMSAs. *Cuban Studies* 8:33-49.
- Du Bois, W. E. B. 1903. *The Souls of Black Folk*. Chicago: A. C. McClurg & Company.
- Farley, R. 1996. Racial differences in the search for housing: Do whites and blacks use the same techniques to find housing. *Housing Policy Debate* 7: 367-385.
- _____. 1997. Modest declines in U.S. residential segregation observed. *Population Today* 25:1-2.
- Farley, R., and R. Alba. 2002. The new second generation in the United States. *International Migration Review* 36:669-701.
- Farley, R., H. Schuman, S. Bianchi, D. Colasanto and S. Hatchett. 1978. Chocolate city, vanilla suburbs: Will the trend toward racially separate communities continue? *Social Science Research* 7: 319-44.

- Farley, R., Charlotte Steeh, Maira Krysan, Tara Jackson, and Keith Reeves. 1994. "Stereotypes and Segregation: Neighborhoods in the Detroit Area." *American Journal of Sociology*, 100(3): 750-80.
- Farley, R., and W.H. Frey. 1994. Changes in the segregation of whites from blacks during the 1980s: Small steps toward a more integrated society. *American Sociological Review* 59:23-44.
- Federal Register. 2008. Vol. 73. No. 51. Page 13836.
- Frey, W.H., and R. Farley. 1996. Latino, Asian and black segregation in U.S. metropolitan areas: Are multi-ethnic metros different? *Demography* 33:35-50.
- Frey, W.H., and D. Myers. 2005. Racial segregation in U.S. metropolitan areas and cities, 1990-2000: Patterns, trends and explanation. *Population Studies Center Research Report 05-573*. University of Michigan, Institute for Social Research.
- Gilmore, Bill. 2004. Houston business: A perspective on the Houston economy. *A report by the Federal Reserve Bank of Dallas, Houston Branch*. Houston, Texas.
- Glaeser, E.L., and J.L. Vigdor. 2001. Racial segregation in the 2000 census: Promising news. *Center on Urban & Metropolitan Policy: Survey Series*. The Brookings Institute.
- Gordon, M.M. 1964. *Assimilation in American life*. New York: Oxford University Press.
- Grant, D.M. 2000. A demographic portrait of Los Angeles County, 1970-1990. In *Prismatic Metropolis: Inequality in Los Angeles*, eds. L.D. Bobo, M.L. Oliver, J.H. Johnson, and A. Valenzuela, 51-81. New York: Russell Sage Foundation.
- Greene, R. P. 1991. Poverty area diffusion: The depopulation hypothesis examined. *Urban Geography* 12: 526-41.
- _____. 1994. Poverty-area instability: The case of Chicago. *Urban Geography* 15: 362-75.
- Haverluck, T. 2007. The changing geography of U.S. Hispanics, 1850-1990. *Journal of Geography*, May/June: 134-45.
- Holloway, S.R., D. Bryan, R. Chabot, D.M. Rogers, and J. Rulli. 1999. Race, scale, and the concentration of poverty in Columbus, Ohio, 1980 to 1990. *Urban Geography* 20:534-51.
- Houston Chronicle*. 2007. Opinions vary over naming the growing Asian community on Houston's southwest side. 9 May, A1.
- Iceland, J. 2004. Beyond black and white: Metropolitan residential segregation in multi-ethnic America. *Social Science Research* 33: 248-71.
- Jargowsky, Paul. 1997. *Poverty and Place: Ghettos, Barrios and the American City*. New York: Russell Sage Foundation.

- Khattab, Nabil, Ron Johnston, Ibrahim Sirkeci and Tariq Modood. 2010. The impact of spatial segregation on the employment outcomes of Bangladeshi men and women in England and Wales. *Sociological Research Online* 15 (1).
- Kwate, N. O. A. 2008. Fried chicken and fresh apples: Racial segregation as a fundamental cause of fast food density in black neighborhoods. *Health & Place* 14: 32-44.
- Lee, B. and P. Wood. 1991. Is neighborhood racial succession place-specific. *Demography* 28: 21-40.
- Li, W. 1998. Los Angeles's Chinese ethnoburb: From ethnic service center to global economic outpost. *Urban Geography* 19: 502-17.
- Logan, J., B.J. Stults, and R. Farley. 2004. Segregation of minorities in the metropolis: Two decades of change. *Demography* 41:1-22.
- Massey, D.S. 1985. Ethnic residential segregation: A theoretical and empirical review. *Sociology and Social Research* 69:315-350.
- Massey, D.S., and N. Denton. 1988. The Dimensions of Residential Segregation. *Social Forces* 67:281-315.
- _____. 1993. *American apartheid: Segregation and the making of the underclass*. Cambridge, MA: Harvard University Press.
- Massey, D. S. and M. L. Eggers. 1990. The ecology of inequality: Minorities and the concentration of poverty, 1970-1990. *American Journal Sociology* 95: 1153-88.
- Massey, D.S., M. J. White, and V.C. Phua. 1996. The dimensions of segregation revisited. *Sociological Methods and Research* 25:172-206.
- Newbold, B.K. 2004. Segmented paths and the differential role of primate immigrant centers. *Geographical Analysis* 36:21-37.
- Omi, M., and H.A. Winant. 1986. *Racial formation in the United States from the 1960's to the 1980's*. New York: Routledge.
- Peterson, D'Ann and Laila Assanie. 2005. The changing face of Texas: Population projections and implications. *The Face of Texas: Jobs, People, Business, Change*, October, 2005.
- Sampson, R.J., Jeffrey Morenoff, and Steven W. Raudenbush. 2005. Social anatomy of racial and ethnic disparities in violence. *American Journal of Public Health* 95: 224-32.
- Strait, J.B. 2001. The impact of compositional and redistributive forces on poverty concentration: The case of the Atlanta, Georgia metropolitan region, 1980-1990. *Urban Affairs Review* 37:19-42.
- _____. 2002. Poverty concentration in a multi-ethnic city: The impact of compositional and redistributive forces in Miami, Florida, 1980-1990. *Southeastern Geographer* 42:159-182.
- _____. 2006a. An epidemiology of neighborhood poverty: Causal factors of infant mortality among blacks and whites in the metropolitan United States. *Professional Geographer* 58: 39-53.

- _____. 2006b. Poverty concentration in the prismatic metropolis: The impact of compositional and redistributive forces within Los Angeles, California; 1990-2000. *Journal of Urban Affairs* 28:71-94.
- Strait, J. B. and G. Gong. 2008. Poverty evolution in the capital of the Sunbelt: An investigation of neighborhood-level poverty among racial and ethnic groups within Houston, Texas; 1990-2000. *Southwestern Geographer* 12: 40-70.
- Strait, J. B., Gang Gong, and Cherisha Williams. 2007. Rubbing elbows in the Big Easy: Residential segregation among racial and ethnic groups in New Orleans, Louisiana; 1990-2000. *Southeastern Geographer* 47: 254-282.
- U.S. Bureau of the Census. 1993. *Census of population and housing, 1990, census tract files*. Washington DC: Bureau of the Census.
- _____. 2003. *Census of population and housing, 2000, census tract files*. Washington DC: Bureau of the Census.
- _____. 2006. *Current Population Survey, 2005, Annual Social and Economic Supplements*. Washington DC: Bureau of the Census.
- White, M.J. 1986. Segregation and diversity: Measures in population distribution *Population Index* 52:198-221.
- Winant, H. A. 1994. *Racial conditions: Politics, theory, comparisons*. Minneapolis, MN: University of Minnesota Press.
- Winsberg, M.D. 1979. Housing segregation of a predominantly middle-class population: Residential patterns developed by the Cuban immigration into Miami, 1950-1974. *American Journal of Economics and Sociology* 38:403-418.
- Yodis, E.G., C.E. Colten, and D.C. Johnson. 2003. *Geography of Louisiana*. New York: McGraw-Hill.
- Zhang, Q. 1998. Residential segregation of Asian Americans in the Atlanta Metropolitan area, 1990. *Southeastern Geographer* 38:125-141.
- Zhou, M. 1992. *Chinatown: The socioeconomic potential of an urban enclave*. Philadelphia: Temple University Press.
- Zhou, M., and C. L. Bankston, C.L. 1998. *Growing up American: How Vietnamese children adapt to life in the United States*. New York: Russell Sage Foundation.
- Zhou, M., and J.R. Logan. 1991. In and out of Chinatown: Residential mobility and segregation of New York City's Chinese. *Social Forces* 70:387-407.