ASIAN RESIDENTIAL SEGREGATION IN HOUSTON, TEXAS

A Thesis

by

BO HEE YOON

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

August 2007

Major Subject: Sociology

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ABSTRACT

Asian Residential Segregation in Houston, Texas. (August 2007)

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This thesis investigates the residential segregation of the Asian population in Houston considering segregation among Asian groups as well as segregation of Asians from broader non-Asian groups, namely whites, blacks, and Hispanics. Methods applied in this thesis draw on previous works on residential segregation and measure segregation using indices of exposure and isolation and indices of uneven distribution. The demographic and historical backgrounds of Asian populations are reviewed to identify potential reasons for Asian residential segregation. New major findings from my analysis are that Asians have socioeconomic status similar to whites and, thus, have higher socioeconomic status than blacks and Hispanics who have low socioeconomic status. Other major findings are that Asians have moderate segregation from whites, high segregation from Hispanics and even higher segregation from blacks. Detailed Asian groups are mostly moderately segregated from whites and are more highly segregated from Hispanics and blacks. Also, Asian groups are sometimes highly segregated from each other. In conclusion, residential segregation of both broad racial and ethnic groups and Asians are affected by education and income in Houston area including other factors. Based on my analysis, I predict that the pattern of Asian residential segregation will still follow the previous patterns based on education and income.

To my mother, father, and brother

ACKNOWLEDGMENTS

I would like to thank my committee chair Dr. Fossett for his dedicated guidance and support throughout this research. His effort and help was so tremendous on this research that it would have been impossible for me to finish my thesis without his patient advice.

I would like to thank my advisory committee members Dr. Poston, Dr. Saenz, Dr. Sui, and Dr. Albrecht for their kind care. Thanks to my colleague Warren Waren for his help. Thanks also to the department faculty and staff for making my time at Texas A&M University a great experience.

Most of all, I would like to thank my mother, father, and brother for their support, love, and encouragement. Their devotion, especially my mother, helped me endure all the hard and difficult time during my studies. Also, I would like to thank God for helping and guiding me.

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CHAPTER I

INTRODUCTION AND OVERVIEW OF THESIS

There has been a substantial increase in the size of the Asian population in the U.S. in recent decades, especially after key changes in immigration law enacted in 1965. Before 1965 the Asian population in the U.S. was relatively small. In 1960 it was 0.5 percent. "After the passage of the 1965 Immigration and Nationality Act, Asia quickly became the second-largest source of immigrants to the United States, and, as a result, the Asian American population has grown rapidly" (Xie and Goyette 2005:420) reaching 1.4 percent in 1980 to 3.9 percent in 2000. As a result, Asians are now considered one of the most important immigrant groups in America and the third largest minority group behind Hispanics and blacks.

As in the U.S. overall, the Asian population has increased in the Houston metropolitan area. The growth of the Asian population in Houston reflects important changes in the ethnic composition of Houston. These changes create a need for research on residential segregation of the Asian population. Despite the rapid increase in the Asian population, few studies have examined residential segregation of detailed Asian groups (e.g., Chinese, Koreans, etc.) in urban cities in the U.S. Most studies focus on broad racial groups like whites, blacks, Asians, and Hispanics. This study on the residential segregation of the specific Asian group addresses this gap in the literatures.

This thesis follows the style of *American Sociological Review*.

Houston has been growing rapidly in recent decades and the growth of minority populations, especially the Asian population, has led the way. Table 1.1 documents that for Houston, the total population increased 20.9% from 1980 to 1990 and 34.6% from 1990 to 2000 considering the three counties of Fort Bend, Harris, and Montgomery. The Asian population of these three counties in Houston increased 150.6% from 1980 to 1990 and 70.7% from 1990 to 2000 showing a much faster rate of increase than the total population of Houston. The rapid growth of the Asian population has had a major impact on Houston's population. Among U.S. primary statistical metropolitan areas, Houston now has the seventh largest number of total Asian population, the fifth largest number of Asian Indians, seventh largest number of Chinese, the fourth largest number of Pakistanis and Taiwanese, and the second largest number of Vietnamese. This makes Houston, Texas an interesting and important metropolitan area in which to study the residential segregation of Asian groups.

Table 1.1 Houston Area Population Increase from 1980 to 2000

County	1980	Increase (%)	1990	Increase (%)	2000
Total Population	2,753,000	34.8	3,711,043	25.8	4,669,571
Fort Bend	130,846	72.3	225,421	57.2	354,452
Harris	2,409,547	17.0	2,818,199	20.7	3,400,578
Montgomery	128,487	41.8	182,201	61.2	293,768
Sub Total	2,668,880	20.9	3,225,821	34.6	4,342,566
Asian Population	51,235	157.9	132,131	72.7	228,212
Fort Bend	3,725	284.6	14,328	176.0	39,545
Harris	46,355	139.1	110,848	56.1	173,026
Montgomery	358	244.1	1,232	157.1	3,167
Sub Total	50,438	150.6	126,408	70.7	215,738

Source: U.S. Census Bureau (U.S. Census Bureau 1983, 1993, and 2001a)

The emergence of this significant and rapidly growing population raises questions about their impact on residential patterns in Houston. Are they residentially segregated from the large, established population groups in Houston, namely whites, blacks, and Hispanic? And are they residentially segregated from each other?

The goal of this thesis is to review and analyze residential segregation among the Asian population living in Houston. This thesis is organized in the following manner. Chapter II reviews previous studies of residential segregation of racial and ethnic groups giving particular attention to studies of Asian segregation. The historical background of different Asian groups is reviewed and possible reasons for expecting Asian residential segregation are also discussed. Next, Chapter III reviews the methods and data that are applied in this thesis.

Then, Chapters IV to VI examine residential segregation among Asians and other racial groups by considering measures of isolation, exposure, and uneven distribution. In Chapter IV, the social characteristics of each group are examined using data from the Census Bureau Public Use Micro Sample File for 2000. These data reveal important difference between groups, difference that provide a context for understanding their differences in residential patterns.

Chapter V analyzes the residential patterns for Asian groups using data from the Census Bureau Summary Files. Residential segregations among Asian populations are reviewed by looking at both broad racial groups and Asian subpopulations. I present analysis showing that group residential outcomes follow group distributions on educational attainment and income.

Chapter VI examines residential segregation of broad racial groups and Asian subgroups based on uneven distribution using three measures: the Dissimilarity Index (D), the Variance Ratio (V), and the Separation Index (S).

Chapter VII summarizes the results of the analysis and considers their implications for future study. I also speculate on the future of the Asian populations in Houston and the answers to the questions "How will the Asian residential patterns change in the future?", and "Will the residential segregation among Asians (among Asians and Whites, among Asians and minorities) increase or decrease in the future?"

CHAPTER II

BACKGROUND AND PERSEPCTIVE

Massey and Denton note that "urban America is still a residentially segregated society" (1993:1) and argue that residential segregation is a key institutional factor contributing to racial inequality and minority poverty. They define residential segregation as "the degree to which two or more groups live separately from one another, in different parts of the urban environment" (Massey and Denton 1988:282). Segregation has many dimensions (Massey and Denton 1988). In this thesis, I investigate two major dimensions, contact and evenness of distribution. These are the most important and most widely studied dimensions of segregation.

Segregation reflects the spatial assimilation of minority groups or the lack of it. Massey and Mullan (1984), in an article about the process of Hispanic and Black spatial assimilation, note that spatial assimilation is the process whereby a group attains residential propinquity with members of a host society and changes in education, income, and occupational status are usually followed by changes in location. Massey (1985) reviews the model of spatial assimilation and residential segregation set forth by urban ecological theory. He notes that immigrant ethnic populations have generally followed a pattern wherein spatial assimilation follows acculturation and assimilation on socioeconomic characteristics. Empirical studies suggest this model applies for Latinos and Asians as it did previously for European immigrant groups, but does not apply to African Americans.

Previous research on Asian residential segregation has mostly focused on the broad racial category of the Asian population instead of the specific groups of Asians. A recent study of residential segregation by Douglas Massey (2000) is interesting because it focuses on residential segregation among white, blacks, and Asians. Another recent study about Asian residential segregation by Michael J. White, Eric Fong, and Qian Cai (2003) is interesting for focusing on multiple Asian groups. They "examine the comparative residential segregation of Asian-origin groups in the United Stated and Canada" (White, Fong, and Cai 2003). Although they review historical facts and the dissimilarity index of the different Asian groups, they do not cover it based on the specific cities in the U.S. and they examine only a few Asian groups. Accordingly, my focus on the residential segregation of the different Asian groups in Houston can make a significant contribution to the literature, since there are few studies of residential segregation of specific Asians groups in a specific urban area in the U.S.

Lieberson (1980) discussed the residential assimilation experiences of Asians in the U.S. He notes that they share key characteristics with African Americans in having distinctive phenotype. But he also notes that they are similar to European immigrant groups in being voluntary migrants. Thus, he speculates that their experiences may fall somewhere between those of European immigrant groups and African Americans.

Historical Background of Asian Immigration and Population Growth

Table 2.1 shows that the Asian population has grown rapidly in recent decades. This pattern is observed for the nation, for the State of Texas, and for Houston.

According to the U.S. census, the Asian population in America numbered 3,466,847 in 1980, 6,908,638 in 1990, and 10,123,169 in 2000. In Texas, there are 554,445 Asians. Of these were 129,365 Asian Indians, 105,829 Chinese, 58,340 Filipinos, 17,120 Japanese, 45,571 Koreans, 134,961 Vietnamese, and 71,133 other Asians.[1] The total Asian population living in Houston was 226,177 in 2000 making it the seventh largest city in the U.S. in terms of Asian population. The specific numbers of detailed Asian groups in Houston are 51,959 Asian Indians, 2,648 Cambodians, 45,182 Chinese, 22,494 Filipino, 4,320 Japanese, 10,341 Korean, 10,633 Pakistani, 3,355 Taiwanese, and 63,924 of Vietnamese.

Table 2.1 Population Size of Broad Racial Groups and Detailed Asian Groups in the Year 2000

	U.S.	Texas	Houston
Broad Racial Groups			
White	194,552,774	10,933,313	2,239,893
Black	33,947,837	2,364,255	778,684
Hispanic	35,305,818	6,669,666	1,348,588
Asian	10,123,169	554,445	226,177
Detailed Asian Groups			
Chinese	2,314,537	105,829	45,182
Japanese	796,700	17,120	4,320
Korean	1,076,872	45,571	10,341
Filipino	1,850,314	58,340	22,494
Asian Indians	1,678,765	129,365	51,959
Pakistani	153,533	19,102	10,633
Vietnamese	1,122,528	134,961	63,924
Cambodian	171,937	6,852	2,648
Taiwanese	118,048	6,931	3,355

U.S. Census Bureau (U.S. Census Bureau 2001a)

[1] Data were from tabulation reported in Summary File 1 of the U.S. Census Bureau 2001a.

In this section I briefly sketch the demographic histories of the major groups within the broader Asian population in the U.S.

The Chinese

The first Chinese immigrants came to San Francisco before the Gold Rush of 1849. Their numbers increased rapidly in California based on the economic boom associated with the gold rush (Kitano and Daniels 2001:21). Most of them worked "at gold mining, in agriculture, at various urban occupations, and, most spectacularly, as the builders" (Kitano and Daniels 2001:23). Also, there were early Chinese immigrants in Hawaii brought in as indentured laborers. Although the Chinese population in America increased to just over 100,000 during the 1870s, the population steadily declined soon after influenced by the Chinese Exclusion Act of 1882. But after the 1900s, the population of the Chinese increased primarily by natural increase until 1965, due to strict immigration restriction. After 1965 the Chinese population increased rapidly due to immigration. There were 237,292 Chinese population in 1960, 436,062 in 1970, 812,178 in 1980, and 1,645,472 in 1990 (Kitano and Daniels 2001:50).

After the 1880s, urban service occupations like laundries, restaurants, grocery stores became the major jobs for Chinese. "Unlike most modern immigrant groups, Chinese were initially found largely in rural and small-town America" (Kitano and Daniels 2001:30). However, the Chinese living in cities increased after 1910. Most of the Chinese immigrants lived in San Francisco, which was the cultural, economic, and administrative hub of Chinese America (Kitano and Daniels 2001:31). Other Chinese

were found in cities like New York, Los Angeles, Chicago, Seattle, Portland, Sacramento, and Boston. Their enclaves were often called Chinatown. "Most of the early Chinese did not easily acculturate, integrate, or participate in the American society (Kitano and Daniels 2001:30).

The Japanese

The first large group of Japanese migrants came to Hawaii as indentured laborers in the 19th century and after the U.S. annexed Hawaii in 1898 many of them re-emigrated to the American West Coast. "In 1900 the census identified almost 25,000 Japanese on the West Coast; by 1920 there were more than 110,000, almost two-thirds of them in California" (Kitano and Daniels 2001:57). But due to the Gentlemen's Agreement Japanese immigration was restricted from 1907 to 1924. However, "they were the most populous Asian American group from 1910 to 1960" (Xie and Goyette 2005:417). But few Japanese entered the U.S. after the immigration laws after the 1965 because of their prospering economy.

The Japanese were employed in agriculture and railroad maintenance and were composed of peasants. However, Japanese who lived in cities worked primarily at service trades and in small businesses. Initially, San Francisco and Seattle were the major Japantowns, but by 1910, Los Angeles began to prevail and by 1940, Los Angeles had nearly 37,000 Japanese people; Seattle had the second largest Japanese American population almost 7,000 and San Francisco ranked third with some 5,000 Japanese (Kitano and Daniels 2001:63). There is also the significant phenomenon of war brides

tracing to U.S. military occupation of Japan after World War II. War bride marriages represent an experience that sets some Asian-American groups apart from other minority groups. “Many U.S. military men serving in Asia have married Asian women” (Aguirre, Hwang, and Saenz 1994:549), especially white men (88%). Most of these war brides have low socio-economic position. This might have affected Asian’s relationships with whites in the U.S.

The Koreans

The first Korean laborers, who arrived at Hawaii in 1903, were primarily from the lower class but very few were peasants. The second group of Koreans, who came between 1951 and 1964, were mostly wives of American servicemen (war brides), war orphans, and students connected to the Korean War. “The current immigration is family oriented and includes a large proportion of house wives and children” (Kitano and Daniels 2001:126). The majority of Koreans have settled in urban areas like Chicago, New York, and especially Los Angeles but they are the most dispersed Asian group in terms of geographic distribution after the Asian Indians related to job opportunities.

The Korean population in the U.S. stood at 70,000 in 1970, 357,393 by 1980, and 789,849 in 1990, which shows the growth of the Korean population is mostly due to recent immigration. “However, unlike the early Chinese, Japanese, and Filipinos, Korean immigrants often arrived in family groups” (Kitano and Daniels 2001:120) leading to difficulty of the first generation Korean to assimilate to the U.S. culture. The Korean churches are central to the Korean community. Other important fact of the Korean

immigrants is the Los Angeles riot of 1992, which caused conflict between Korean and black community.

The Filipinos

The history of the Filipinos was, initially, a direct and unforeseen result of American imperialism (Kitano and Daniels 2001:88). In 1898 the Philippines became a U.S. possession after Spanish-American War. Filipinos first came to America and Hawaii immediately after American acquisition of the Philippines from Spain in 1898 (Posadas 1999:13). The Filipino population numbered 406 in 1910, 5,603 in 1920, 45,208 in 1930, and 45,876 in 1940 (Posadas 1999:15). The Filipinos and the U.S. have had special relationship more than one hundred years. "That relationship has been military, economic, cultural, and demographic, but most notably political (Posadas 1999:3)". Unlike other Asian groups, they were more like American nationals instead of "aliens." "The first Filipino immigrants to the United States were students, the *pensionados*, who were chosen, financed, and sponsored by the U.S" (Kitano and Daniels 2001:90).

"But as with most other immigrants, it was economic rather than intellectual aspiration that motivated most Filipinos who came" (Kitano and Daniels 2001:91). The total populations of Filipinos in the United States were 181,614 in 1960, 336,731 in 1970, 774,652 in 1980, and 1,419,711 in 1990 (Kitano and Daniels 2001:96). "Filipino Americans are highly concentrated in California and Hawaii, where in 1990 almost two-thirds of them (64 percent) lived" (Kitano and Daniels 2001:96).

The Asian Indians

Most Asian Indians immigrated to the U.S. after 1960 (White, Fong and Cai 2003:156). According to the 2000 Census, Asian Indians now number about 1.7 million. Although Asian Indians are less than 0.5% of the national population of the US, they are one of the wealthiest groups with a heavy concentration of doctors, engineers, computer specialists, and college and university professors. The Indian self-employment rate is about 16%, behind Koreans at 24%, but comparable to the Chinese/Taiwanese (17%). The poverty rate among Asian Indians is one of the lowest. Asian Indians, despite their economic success, are less important to political parties and leaders, unlike other groups of comparable size, such as the Koreans in Los Angeles.

The Pakistanis

Pakistan emerged as an independent nation in 1947. Bangladeshi who came to America between 1947 and 1972 are recorded as Pakistani, and in the 1990 census, about 100,000 persons reported that they were of Pakistani origin. Between 1990 and 1997, an additional 93,000 immigrants came from Pakistan. There have been no systematic studies of the Pakistanis in America. “One place where a sizable Pakistani community has developed is in Chicago, where Asian Indians and Pakistanis share a business district along Devon Avenue” (Kitano and Daniels 2001:116).

The Vietnamese

The Vietnamese population was small in 1960. Vietnamese first came to America in significant numbers as refugees in the 1970s after the Vietnam War. Refugee camps were located in California, Arkansas, Florida, and Pennsylvania (Do 1999:32). Also, there were war brides who came to the U.S. resulting from American military presence in Vietnam. According to the 2000 Census, there are 1,122,528 people who identify themselves as Vietnamese alone or 1,223,736 in combination with other ethnicities, ranking fourth among the Asian American groups. Of those, 447,032 (39.8%) live in California and 134,961 (12.0%) in Texas. The largest concentration of Vietnamese found outside of Vietnam is found in Orange County, California—totalling 135,548. In addition, states such as Louisiana, Pennsylvania, Illinois, Minnesota, Washington, and Virginia have fast growing Vietnamese populations. The New England states and the New York City metropolitian area has a sizable Vietnamese community. Recently, the Vietnamese immigration pattern has shifted to other states like Oklahoma (Oklahoma City in particular) and Oregon.

The Cambodians

The Khmer are the majority group in Cambodia, constituting about 85 percent of the population; they are primarily Buddhist (Kitano and Daniels 2001:166). Prior to 1975, most of the few Cambodians in the US were children of upper class families sent abroad to attend school. After the fall of Phnom Penh to the communist Khmer Rouge in

1975, many Cambodians immigrated to the US as refugees. In order to encourage rapid assimilation into American culture, the US government settled the refugees in various towns and cities throughout the country. Large communities of Cambodians took root in cities such as Long Beach, Fresno and Stockton in California and Lowell, Massachusetts.

The Taiwanese

From the late 1950s until the 1970s, many Taiwanese people came to the United States, forming the first wave of post-war Taiwanese immigration. Their entry into the United States was further facilitated by the immigration act of 1965, which removed many of the previous severe restrictions against Chinese immigration. The exact number of Taiwanese-Americans is hard to calculate since most demographic research tends to combine immigrants from Taiwan, Singapore, and Hong Kong into the broadly-defined "Chinese-American" category. However, most statistics, including one by the Formosan Association of Public Affairs (FAPA), puts an estimate at around 500,000.

The historical immigration experiences and the socioeconomic characteristics for detailed Asian groups are summarized in the Tables 2.2 and 2.3 respectively. Table 2.2 shows historical facts and motivations of immigration of the detailed Asian groups. It compares the years of Asian immigration to the U.S., their first settlement place, and the reason of their immigration.

This summary table is based on the historical facts about Asian immigration in Kitano and Daniels' book (2001). Table 2.3 shows socioeconomic status about the income, poverty rates, and education of Asian population. As we can see, the Japanese

and Asian Indians have the highest income. Filipinos have the lowest poverty rate. Asian Indians and Chinese have higher educational attainment than other Asian groups. On the other hand, Cambodians have lowest income, highest poverty rate, and lowest educational attainment than other Asian groups.

Table 2.2 Summary of Immigration Experience for Detailed Asian Groups

	Period of Initial Arrival	Area of First Settlement	Primary Reason for Immigration
Detailed Asian Groups			
Chinese	Early as 1835	Hawaii San Francisco	Shelter from War Economic*
Japanese	1869	Hawaii	For Work*
Korean	1903	Hawaii	For Work
Filipino	1898	Hawaii	Economic
Asian Indians	1898	Hawaii	For Work
Pakistani	1947	No Data	No Data
Vietnamese	1970	Scattered	Political (war refugee)
Cambodian	1975-1979	California	Political (refugee)
Taiwanese	1950	Suburbia	Political

Note: Tables are mostly based on Kitano and Daniel (2001). *Economic**: means economic boom to seek money and job. *For Work**: means to work as indentured laborers.

Table 2.3 Socioeconomic Characteristics of Detailed Asian Groups in the U.S.

	Income (1999)	Poverty Rate (1999)	Bachelor's degree or higher (2000)
Detailed Asian Groups			
Chinese	$60,058	13.5	48.1%
Japanese	$70,849	9.7	41.9%
Korean	$47,624	14.8	43.8%
Filipino	$65,189	6.3	43.8%
Asian Indians	$70,708	9.8	63.9%
Vietnamese	$47,103	16.0	19.4%
Cambodian	$35,621	29.3	9.2%

Source: Reeves and Bennett (2004).

Possible Reasons for Expecting Asian Residential Segregation

In this section I review various reasons for residential segregation for expecting Asian groups to be segregated from non-Asian groups and also from each other.

Similar Reasons for Immigration

Asian groups with similar immigration histories may be more likely to live together. For example, most of Asians like Chinese, Japanese, Koreans, Filipinos, and Asian Indians came to America to work as laborers in Hawaii. In other words, the first Asian immigrants' settlement place were Hawaii to work for economic reasons. This have made Asians live and settle in similar places for residential ethnic enclaves in urban cities in America. Other Asians like Cambodians, Vietnamese, and Taiwanese immigrated as war refugees from their countries. These groups of Asians who came to America for political reasons settled in different places except for Cambodians. Most Cambodians immigrated to California and settled down together in California. It is also noted that there has been US government support for relocation of Vietnamese. Asians like Japanese, Koreans, Filipinos, and Vietnames have an experience coming to America as war brides. These patterns suggest that Asian immigrants who have similar immigrant history are more likely to live together while Asians who have different immigration history are less likely to live together. This tendency also varies by ethnic and racial differences among Asian groups.

Recency of Immigration

Immigration status can also influence residential decisions. “Research suggests that recent immigrants tend to have higher segregation rates than more established group members” (Charles 2001:282). Asian groups that are overwhelmingly composed of recent immigrants are more likely to be segregated from the majority white members and also other established racial groups like blacks.

Culture and Similarity

Cultural similarity can be an important factor for Asians living together. For instance, immigrants from East Asia like China, Japan, and Korea have similar culture since they came from the same region of the world. They eat similar foods like rice and have similar religious background like Buddhism. Also, they had frequent contact with each other in the past and they often are familiar with each other’s culture, since they had long historical connection with each other. This might make the immigrants from these region more familiar with each other and make them live closer to each other infleunced by the regional closeness of the Chinatown, Japantown, and Korean town in LA. Other Asian immigrants from the regions with cultural similarity like Cambodian, Vietnamese, and Filipinos from Southeast Asia may be likely to live together, since they have cultural similarity with each other.

Language Differences

As native Asians have enormous difficulties in learning English, especially the first generation of immigrants, they are more likely to live in their ethnic enclave to communicate with each other, since they may feel more comfortable living with peoples of similar linguistic origin. In other words, Asian Americans who experience linguistic isolation are more likely to live with each other than the Asian groups like Filipinos and Asian Indians who are more fluent in English. In fact, most of the Asian Indians do not settle in residential enclaves. They are well spread out, pretty much across the country.

Population Size

Population size could affect the residential segregation of the Asian groups. The Asian Americans who have large population size like Chinese or Vietnamese may be more likely to live together in their ethnic enclaves, because they "pose a greater threat to the majority than smaller groups" (Jiobu 1988:116). Another reason for larger Asian groups living together is that the greater the number, social interaction between ethnic members increases and this strengthens the sense of community and cultural cohesivness (Jiobu 1988:118). In addition, "the greater and more rapid the immigration, the more pronounced the anticipated increases in segregation and isolation, because large minority populations increase the demographic potential for isolation" (Massey 2000:51). On the other hand, Asians who have small population size like Koreans, Japanese, and Taiwanese may be more likely to spread out instead of forming residential enclaves, especially in Houston. In contrast, Breton (1964) has argued that larger populations can

provide the basis for more complete ethnic institutions (e.g., churches, community organizations, etc.) which can sustain residential enclaves.

Prejudice and Preference

In addition to demographic factors, "ethnicity may determine residential location regardless of socioeconomic status" (Jiobu 1988:128). That is, ethnic and racial preference and prejudice might have a stronger influence on residential settlement of Asians than their socioeconomic status. In fact, race still "remains the dominant organizing principle of U.S. urban housing markets" (Massey 2000:70). As the majority group (white) prefer living with their same ethnic group, the Asian group are more likely to live with each other instead of living with different ethnic groups. In the same way, some Asian groups have prejudice and uneasiness toward each other caused by historical conflict in the past like Japanese and Koreans; so they may prefer not to live near each other. Furthermore, a history of racial incidents shapes Asians' racial attitudes toward other groups, and this could influence their residential decisions. For instance, the 1992 riot in Los Angeles between Koreans and blacks had a major impact on these groups' racial attitudes toward each other. So, Koreans and other Asians might be more isolated from blacks than other minority groups. In addition, there might be different preferences toward each other in the Asian subgroups influenced by other factors. For example, the East Asian like Korean, Chinese, and Japanese might prefer living near each other than with other Asians like Asian Indians and Pakistani from South Asia, since they have large cultural, historical, and regional differences.

Socioeconomic Similarity

"A house is the single largest investment most people ever make and represents a major accomplishment" (Jiobu 1988:129). Consequently, the socioeconomic similarity and differences may influence residential integration and segregation among Asian groups. Asian groups with similar educational and economical status may be likely to live in similar residential areas, while groups that differ on socioeconomic status will tend to live in different places. For instance, Japanese live in suburban areas in Houston because of their high economic status, while Chinese and Koreans live in the inner city of Houston because of their relative low economic status despite of the three group's similar educational attainment. Some speculate that improvement in the economic status of minority groups like Asians helps to lessen their segregation levels in the US (White, Fong, and Cai 2003:165). However, others suggest there might be "lack of a relationship between socioeconomic class characteristics and residential patterns for Asian households" (Charles 2001:285), since other factors might have more influence on Asian residential segregation.

Differential Treatment

Different treatment by Asians toward other Asian groups and other racial groups could be another reason for Asian residential segregation. Asians prefer specific racial groups same as the other racial groups caused by racial prejudice, since many Asians lack of understanding other Asians' and racial groups' culture and history. For example, Asians prefer whites over blacks based on their racial prejudice affected by social

stereotypes toward blacks in America (Charles 2000:191-194). They also less prefer blacks based on some historical conflict like the 1992 Los Angeles riot. Like other groups, Asian preferences are lower for blacks. Also, Asians prefer Asian groups who have similar cultural background. In other words, East Asians are likely to prefer other East Asian groups and South Asian groups prefer other South Asian groups. In addition, some historical conflict might affect the preferences among Asians. For instance, Korean may prefer Chinese than Japanese, since Koreans had conflicts with Japanese in the past caused by the coercive colonization of Korea under the Japanese' imperialism.

The final impact of differential treatment on segregation of Asians is discrimination toward Asians and other minority groups by whites. Whites have usually excluded blacks from their neighborhoods using restrictive covenants which lead to residential segregation of blacks and also concentrating blacks in the ghettos. Although levels of white discrimination and prejudice toward Asians are not as great as those against blacks nowadays, there was intense discrimination toward Asians in the past both informally and by laws. For instance, in the period of anti-Chinese agitation California adopted numerous discriminatory laws against the Chinese like California statue of 1880 used for residential segregation (McEntire 1960:260).

In sum, these are many reasons for expecting segregation of Asians from non-Asian groups and also for expecting segregation among Asian groups.

CHAPTER III

METHODS, DATA, AND MEASURES

This chapter reviews the data, measures and methods I use to investigate the segregation of Asians in Houston. First, I describe how race is defined by the census. Next, I discuss the samples for the data I use. Finally, I describe the measures and formulas used to measure segregation.

Race as Defined by Census Procedures

Analysis in this thesis is performed using the race and Hispanic ethnicity categories defined by the U.S. Census Bureau. The concept of race reflects self-identification by people according to the race or races with which they most closely identify (U.S. Census Bureau 2002b:1057).

White is a person having origins in any of the original peoples of Europe, the Middle East or North Africa. It includes people who indicate their race as "White" or report entries such as Irish, German, Italian, Lebanese, Near Easterner, Arab, or Polish. *Black* is a person having any origins in any of the Black racial groups of Africa. It includes people who indicate their race as "Black, African Am., or Negro," or provide written entries such as African American, Afro-American, Kenyan, Nigerian, or Haitian (U.S. Census Bureau 2002b:1057).

Hispanics or Latinos are not identified as a racial group. The data on the Hispanic or Latino population were derived from answers to questions in which individuals classify themselves in one of the specific Hispanic or Latino categories listed

on the questionnaire-"Mexican," "Puerto Rican," or "Cuban"-as well as those who indicate that they are "other Spanish, Hispanic, or Latino" (U.S. Census Bureau 2002b:1032).

Non-Hispanic white involves the combination of being both white and not Hispanic as outlined in the above paragraphs. From here forward references to "white" will be understood to be "non-Hispanic white" unless otherwise stated.

Asian is a racial category and includes persons having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam. It includes "Asian Indian," "Chinese," "Filipino," "Korean," "Japanese," "Vietnamese," and "Other Asian." The *Asian Indian* category includes people who indicated their race as "Asian Indian" or identified themselves as Bengalese, Bharat, Dravidian, East Indian, or Goanese. The *Chinese* category includes people who indicate their race as "Chinese" or who identify themselves as Cantonese, or Chinese American. When I analyzed the Chinese, I separated Taiwanese from Chinese. I do not review the definitions of other detailed Asian groups, since most of them are similar in form (U.S. Census Bureau 2002b:1058).

Sampling

Data for broad racial and Hispanic ethnicity groups came from Summary File 1, which is based on the 100% or "full count" questionnaire. Data for Asian subgroups also came from Summary File 1. I focus on census tracts, since counts are available for both

broad racial groups and detailed Asian groups at this level. I use these data to compute segregation indices.

Data for educational attainment and family income for census tracts came from Summary File 3, which is based on sample data. I use these data to compute neighborhood outcomes such as area education and area income used to compute exposure measures.

I obtained the data for social characteristics of broad racial and detailed Asian groups from the Public Use Micro Sample (PUMS) for 2000. I used the 5% sample version of the PUMS to obtain a 5% sample of individuals for Houston, Texas.

Group Differences in Social Characteristics

I draw on the Public Use Micro Sample (U.S. Census Bureau 2003c) data to describe the socio-demographic characteristics of Asians and other broad racial and ethnic groups living in Houston. Each group's distribution on variables related to race and ethnicity, education, income, language, and immigration is compared. These analyses are reported in Chapter IV.

Segregation Measures

Massey and Denton (1988) identify five dimensions of residential segregation; evenness, exposure, concentration, centralization, and clustering. In my analysis of residential segregation, I focus primarily on exposure and evenness. By far, these are the two most widely studied dimensions of segregation. Evenness concerns the differential

distribution of two social groups among areal units in a city. The most widely used measure for evenness is the index of dissimilarity (D) that is also used in this analysis. In addition, I also use the variance ratio (V) and the separation index (S), a new measure of uneven distribution.

Exposure concerns the degree of potential contact, or exposure of one group to another group or to a particular neighborhood outcome (e.g., average income). The standard measures are expressed as exposure index and the isolation index, which is also used in this analysis. Each groups' degree of residential segregation is evaluated by comparing differences in their exposure to educational attainment, family income, other groups, and to their own group (known as "isolation"). The formula for exposure (P) is as follows.

$${}_{X}P_{Y} = \sum x_i(y_i) / N_x$$

i = index for areas

X = group Y = area outcome for census tracts

x_i = count for group X in area i, y_i = outcome for area i

N_x = city population for group X

If Y measures income, y_i will be median income and if Y measures percent of white, y_i will be w_i/t_i.

When Y measures relative (i.e., percentage) exposure to other ethnic groups:

y_i = Percent White = $100 \cdot w_i/t_i$

y_i = Percent Black = $100 \cdot b_i/t_i$

y_i = Percent Hispanic = $100 \cdot h_i/t_i$

y_i = Percent Asian = $100 \cdot a_i/t_i$

Similarly, I measured group isolation based on relative exposure to the same group. For example, whites' contact with whites, blacks' contact with blacks, etc.

When Y measures area status,

y_i = median family income for tract i (all families)

y_i = mean education for person 25 and above for tract (0 to 6 scale)

I measured the neighborhood outcome of area socioeconomic status based on the average education for the population age 25 and above in each census tract. The seven variables for each calculation are; 0 = less than 9^{th} grade, 1 = 9^{th} to 12^{th} grade, 2 = high school graduate, 3 = some college, 4 = associate degree, 5= bachelor's degree, 6 = graduate or professional degree. I used this outcome (Y) to compute exposure indices for neighborhood educational attainment for detailed Asian groups and for broad racial and ethnic groups in Houston, 2000.

I measured area economic status based on the median family income of all families in the census tract. I used this to then compute exposure indices for

neighborhood income for detailed Asian groups and for broad racial and ethnic groups in Houston in 2000.

I use several measures to assess the uneven distribution of groups relative to each other. They are the index of dissimilarity (D), the isolation index (I) (and variations of this measure), the variance ratio (V), and the separation index (S). D, I, and V are well known and widely used in previous research (Massey and Denton 1988). S is a new measure developed by Fossett (2007) for assessing segregation involving small groups. The relevant formulas are:

$$D = \sum [t_i|P_i-P|/2TP(1-P)]$$

$$I = {}_XP^*_X = \sum [X_i/X][X_i/t_i]$$

$$V = \sum t_i(P_i-P)^2/TP(1-P)$$

Another measurement "S" (separation index; ${}_XP_X - {}_YP_X$) is used in my analysis. S is similar to V but is unbiased where V, D, and I are biased. S has attractive technical characteristics. Specifically, S has an expected value of almost zero under random assignment. In addition, this expected value is always the same (zero); it does not vary with group ratios or the size of areal units. No other segregation index has these desirable technical qualities. For example, the expected values of D,V, and I all are non-zero and vary with group ratios and the size of areal units.

V and S are similar. The only difference is in how neighbors are calculated. For V, the household is treated as a neighbor to itself. This is also the case for D and I. This

approach creates upward bias in the expected values of V, D, and I (Fossett 2007). Calculations of S do not treat the household as a neighbor to itself. This modification eliminates bias and gives the measure for expected value of zero under random assignment.

S is computed from contact scores. This can be done in three different ways, each are yielding a different substantive interpretation. V also can be computed in the same manner. The only difference between V and S is whether the contact measures treat households as being neighbors to themselves or not. S does not. V does.

The three versions are relative pair-wise isolation (RPI), relative contact deficit (RCD), and simple contact difference (SCD). All three approaches yield the same result. All three calculations yield identical expected values for S and V.

RPI is Relative Pair-Wise Isolation. Isolation is in-group contact and relative isolation is unexpected or excess isolation. The formula is as follows.

$100 \cdot (O-E)/(100-E) = 100 \cdot ({}_XP_X-P)/(100-P)$

$O = {}_XP_X$ = observed pair-wise isolation

$E = N_X/(N_X+N_Y)$ = expected pair-wise isolation when X and Y are population totals

${}_XP_X = P$ (under integration)

${}_XP_X = 100$ (under segregation)

RPI = 0 , when ${}_XP_X = P$

RPI = 100, when ${}_XP_X = 100$

RCD is Relative Contact Deficit. The formula is as follows.

$100 \cdot (E-O)/E = 100 \cdot (P-{}_{Y}P_{X})/P$

$O = {}_{Y}P_{X}$ = observed pair-wise contact[2]

$E = N_{Y}/(N_{X}+N_{Y})$ = expected pair-wise contact = P

RCD = 0, when ${}_{Y}P_{X} = P$

RCD = 100, when ${}_{Y}P_{X} = 0$

SCD is Simple Contact Difference. The formula is as follows.

$SCD = {}_{X}P_{X} - {}_{Y}P_{X}$

${}_{X}P_{X}$ = observed same-group contact

${}_{Y}P_{X}$ = observed other group contact

SCD = 0 when ${}_{X}P_{X} = {}_{Y}P_{X} = P$

SCD = 100 when ${}_{X}P_{X} = 100$ and ${}_{Y}P_{X} = 0$

[2] Note that here contact is computed using counts for X and Y only.

CHAPTER IV

COMPARING GROUPS ON SOCIAL CHARACTERISTICS

In this chapter, I examine the social characteristics of the broad racial and ethnic groups and detailed Asian groups living in Houston. My objective is to document group differences on social characteristics like education, income, language, and immigration.

The differences documented here provide a basis for expecting patterns of residential segregation of different racial groups. For instance, we can expect that differences in exposure to area status based on education and income will follow group differences in educational attainment and income.

Group Differences in Social Characteristics

Tables 4.1 and 4.2 summarize the social characteristics of different racial and ethnic groups in Houston. These tables are based on analysis of the 5% PUMS sample for persons age 25 and above in Houston. Table 4.1 is the weighted table and Table 4.2 is the unweighted table[3]. They both have similar results except for the sample number of the population. Table 4.2 establishes the actual number of cases in the PUMS file for each group. Table 4.1 provides the estimates of population counts and means using appropriate weighting for each case.

[3] Weighted results apply census sampling weights for persons.

Table 4.1 Summary of Weighted Social Characteristics of Racial and Ethnic Groups in Houston MSA for Persons Aged 25 and Above

	Weighted Number	Educational Attainment	Family Total Income	Percent Linguistic Isolation	Percent Speak English	Percent Citizen	Percent Foreign Born
Broad Racial and Ethnic Groups							
White (non-Hispanic)	1,536,376	3.40	$ 70,855	0.6	99.4	97.6	4.4
Black	459,271	2.67	$ 40,038	0.7	99.4	96.8	5.9
Asian	146,631	3.59	$ 66,190	27.3	78.5	57.8	94.5
Hispanic	667,381	1.58	$ 43,262	28.8	66.5	55.9	62.1
Detailed Asian Groups							
Asian Indians	32,777	4.20	$ 79,048	11.0	90.8	48.0	96.6
Cambodian	1,515	1.64	$ 67,076	48.7	56.1	64.4	98.2
Chinese	31,327	4.04	$ 65,770	32.8	76.1	55.1	92.5
Filipino	14,693	4.18	$ 75,903	8.1	96.1	66.8	90.6
Japanese	2,994	3.97	$ 70,423	31.4	88.9	44.2	67.4
Korean	6,875	3.59	$ 53,467	31.3	70.9	59.0	95.1
Pakistani	5,902	3.97	$ 62,400	10.9	89.4	42.6	99.8
Taiwanese	2,750	4.34	$ 70,668	32.8	73.2	59.2	99.0
Vietnamese	41,150	2.49	$ 55,789	43.5	64.1	67.7	97.2

Source: U.S. Census 2000 Public Use Micro Sample (U.S. Census Bureau 2003c)

Table 4.2 Summary of Unweighted Social Characteristics of Racial and Ethnic Groups in Houston MSA for Persons Age 25 and Above

	Unweighted Number	Educational Attainment	Family Total Income	Percent Linguistic Isolation	Percent Speak English	Percent Citizen	Percent Foreign Born
Broad Racial and Ethnic Groups							
White (non-Hispanic)	70,735	3.33	$ 70,233	0.6	99.4	97.8	4.1
Black	19,833	2.61	$ 39,114	0.6	99.4	97.2	5.3
Asian	5,963	3.57	$ 68,354	27.1	78.0	58.8	94.5
Hispanic	29,390	1.55	$ 43,105	28.4	66.8	56.7	61.4
Detailed Asian Groups							
Asian Indians	1,318	4.21	$ 82,952	10.8	91.5	50.8	96.5
Cambodian	69	1.51	$ 65,469	40.6	56.5	62.3	98.6
Chinese	1,276	4.06	$ 67,436	33.0	75.5	55.6	92.4
Filipino	606	4.15	$ 76,370	8.4	95.5	68.0	90.6
Japanese	132	3.99	$ 74,806	31.8	89.4	42.4	70.5
Korean	291	3.56	$ 56,839	29.9	69.1	57.7	95.2
Pakistani	232	3.83	$ 60,721	11.6	87.1	41.4	99.6
Taiwanese	107	4.28	$ 71,353	30.8	72.9	60.7	99.1
Vietnamese	1,672	2.49	$ 58,241	42.6	63.2	68.4	97.6

Source: U.S. Census 2000 Public Use Micro Sample (U.S. Census Bureau 2003c)

Education and Income

Tables 4.1 shows that both whites and Asians have high mean educational attainment and family income. By comparison, blacks and Hispanics have low mean educational attainment and family income. This will later affect the results of the mean residential outcome of both neighborhood education levels and neighborhood income levels. Most of the detailed Asian groups have high mean educational attainment and family income, especially Asian Indians, Filipinos, Japanese, Pakistanis, and Taiwanese. However, Cambodians and Vietnamese have relatively low educational attainment nearly close to blacks and Hispanics even though they have higher mean family income than blacks and Hispanics. This might reflect their immigration history because most came to America as war refugees.

Language Differences

Language is an important aspect of culture that may affect residential segregation. Table 4.1 presents two variables which index language differences across groups. The first is linguistic isolation. As measured by the census, a household in which all members 14 years old and over speak a non-English language and also speak English less than "Very well" (have difficulty with English) is "linguistically isolated." All the members of linguistically isolated households are tabulated as linguistically isolated, including members under 14 years old who may speak only English (U.S. Bureau of Census 2000c:331). Table 4.1 shows that whites and blacks are least linguistically isolated and both Asians and Hispanics are more linguistically isolated. The results for

the detailed Asian groups show that Asian Indians, Filipinos, and Pakistanis have low levels of linguistic isolation due to the colonialism of England and America which influenced the language of these countries. In other words, many immigrants who come from India, Pakistan, and the Philippines are fluent in English and they have the tendency of low residential segregation. According to the Census, the percentages of linguistic isolation for Asian Indians and Filipinos were 17.2 and 13.0 at 1990 in the U.S., which were the lowest among the detailed Asian groups, and in 2000 they were 11.0 and 8.1 in the Houston area.

The next variable indexing language is persons who speak English. Whites and blacks have higher English ability than Asians and Hispanics. This shows that whites and blacks are less likely to be residentially segregated in the U.S. due to language problems than Asians and Hispanics. In other words, Asians and Hispanics are more likely to use their native language at home and are less fluent in English than blacks and whites. Cambodians and Vietnamese are most linguistically isolated and have lower English ability than other detailed Asian groups, which means that they are more subject to language problems than other Asian subgroups. On the other hand, Asian Indians, Filipinos, ands Pakistanis have lower linguistic isolation and higher English ability. Based on this, we might expect Asian Indians, Filipinos, and Pakistanis to be less segregated from whites and blacks than Cambodians and Vietnamese.

Immigration and Citizenship

Tables 4.1 also presents the percentages who are citizens and foreign born for each group.[4] Whites and blacks have higher percentages on citizenship and lower percentages on foreign born than Asians and Hispanics. This means that Asians and Hispanics may be less likely to be residentially segregated in the U.S. because they both came to America recently and most are foreign born instead of being a citizen in the U.S. leading them to settle in ethnic enclaves than blacks and whites. The results for detailed Asian groups are very similar in both tables.

Implications for Segregation

The patterns of differences on social characteristics across the broad racial and ethnic groups may have implications for residential outcomes and also for patterns of residential segregation of broad racial and ethnic groups and also the detailed Asian groups. Figure 4.1 summarizes the patterns of group differences on social characteristics. This figure highlights factors that might affect residential outcomes and patterns of residential segregation. Whites and blacks have low language (linguistic isolation and English ability) and immigration differences (citizenship and foreign born), but they have high socioeconomic differences (education and income). Their differences on educational attainment and income may affect their residential outcome on area status on educational attainment and income, which could be an important factor on the residential segregation between them.

[4] See Appendix Tables A5 and A6 for more detailed data related to citizenship and foreign born.

Next, the comparison of Hispanics and whites and also the comparisons of blacks and Asians are marked by differences on language, immigration, and socioeconomic status. If residential outcomes follow theses differences, the residential segregation among both of these cases might be high. However, it might be different than expected, since other factors like racial prejudice and preference might have higher influence on residential segregation than these factors.

Asians and whites have low socioeconomic differences but have high or differences on language and immigration. This suggests that residential outcomes and segregation might be affected more by their language and immigration differences than their socioeconomic differences. Alternatively, Asians and whites might be more likely to live together, since they have similar socioeconomic status.

One limitation to note is that, while Figure 4.1 notes group differences, it is not obvious what factors have stronger effect than others. Blacks and Hispanics have low socioeconomic status, while they have high language and immigration differences. This implies that blacks and Hispanics might live together due to their socioeconomic status, but they might not live together due to their high differences on language and immigration. Asians and Hispanics have high socioeconomic and language differences, while these groups have low immigration differences. This implies that Asians and Hispanics might not live together due to their high socioeconomic and language differences, but they might also live together because of their low immigration differences.

	White	Black	Hispanic	Asian
White	---	---	---	---
Black	SES - High Language - Low Immigration – Low	---	---	---
Hispanic	SES - High Language - High Immigration – High	SES - Low Language - High Immigration - High	---	---
Asian	SES - Low Language - High Immigration - High	SES - High Language - High Immigration - High	SES - High Language - High Immigration - Low	---

Figure 4.1 Summaries of Group Differences on Social Characteristics

In the next chapter I examine group differences in residential outcomes such as group proportions and area status using exposure indices. I also consider how group differences in residential outcomes vary in relation to the group differences in social characteristics documented in this chapter.

CHAPTER V

ANALYSIS OF EXPOSURE AND ISOLATION

This chapter reviews residential outcomes for racial and ethnic groups in Houston as assessed by exposure indices computed at the census tract level. Analysis here is limited to those Asian groups that have adequate numbers for studying distributions at the census tracts level. Asian groups, whose residential outcomes have large standard errors – due to small samples - and thus low reliability, are excluded from this analysis. Accordingly, this analysis focuses on Asian groups which have a total population of at least 2,000.

Table 5.1 presents a summary of the key results[5]. It shows that Asians and whites have high mean area education and area income, while blacks and Hispanics have low mean area education and area income. The detailed Asian groups mostly have high mean area education and area income. Cambodians and the Vietnamese are exceptions. They have relatively low mean area education and area income compared to other Asian groups. Asians have relatively high mean exposure to area percent white, the next highest mean exposure to whites are Hispanics. Blacks have the lowest mean. The detailed Asians groups mostly have high mean exposure to area percent white. The Vietnamese and Cambodians have relatively low means.

Most of the racial groups and also the detailed Asian groups have low mean exposure to area percent black. Blacks have the highest mean exposure to area percent

[5] The Appendix presents detailed tables for each of the variables presented in Table 5.1.

black. Cambodian and Vietnamese have relatively high mean exposure to area percent black and area percent Hispanic among detailed Asian groups. The whites have the highest mean exposure to area percent white among the broad racial and ethnic groups. Most of the detailed Asian groups have relatively high mean exposure to area percent Asian.

I next review group differences in neighborhood outcomes in more detail.

Educational Attainment and Income

Whites and Asians are similar with the highest mean exposure to neighborhood education, while blacks and Hispanics have the lowest mean exposure. This implies that whites and Asians may be more likely live together, since they have high educational attainment and Asians really put a lot of importance on education. For example, most of Asians which come from the regions of East Asia believe in Confucianism, which emphasizes the importance of education. This is why Chinese and Korean are highly motivated on education. In addition, both whites and Asians have higher income than other racial groups. This also increases the possibility of whites and Asians living in similar residential areas in Houston. However, racial discrimination and prejudice might hinder whites and Asians from living together. On the other hand, language difference will segregate Asians from whites, since overall Asians have lower ability to speak English fluently than other racial groups and are high on linguistic isolation.

Table 5.1 Summary of Group Differences in Residential Outcomes Assessed Using Exposure Indices

	Exposure Measures of Residential Outcomes ($_XP_Y$)							
	Number Weighted	Mean Education	Mean Income	Percent White	Percent Black	Percent Hispanic	Percent Asian	Percent Same Group
Broad Racial and Ethnic Groups								
White	2,239,893	2.8	$ 66,332	65.6	8.2	19.8	4.6	65.6
Black	778,684	2.3	$ 40,678	23.7	45.2	25.3	4.4	45.2
Asian	226,177	2.9	$ 62,250	45.3	15.3	23.8	13.4	13.4
Hispanic	1,348,588	2.0	$ 42,384	32.9	14.6	47.1	4.0	47.1
Detailed Asian Groups								
Asian Indians	51,959	3.0	$ 67,970	49.7	14.4	19.8	13.8	4.3
Cambodian	2,648	2.4	$ 51,719	38.9	19.7	31.1	8.4	1.1
Chinese	45,182	3.0	$ 68,062	48.7	12.9	20.9	15.2	4.8
Filipino	22,494	2.9	$ 60,558	45.2	17.9	22.6	12.1	1.7
Japanese	4,320	3.2	$ 72,671	62.7	9.1	17.6	8.4	0.6
Korean	10,341	3.0	$ 68,201	56.7	9.6	21.6	9.9	1.1
Pakistani	10,633	2.9	$ 60,306	44.2	15.7	22.7	14.7	1.7
Taiwanese	3,355	3.3	$ 80,459	56.6	10.1	15.6	15.5	0.7
Vietnamese	63,924	2.5	$ 52,360	36.0	18.0	30.7	13.2	5.9

Source: Summary Files 1 and 3 from U.S. Census 2000 (U.S. Census Bureau 2001a and 2002b)

Compared to whites and Asians, blacks and Hispanics have much lower mean exposure to neighborhood education. This similarity between blacks and Hispanics might increase the possibility that they are living together in similar residential area in Houston. Also, blacks and Hispanics have lower mean income than other racial and ethnic groups leading to their residential closeness influenced by their similar economic situation. However, their language and cultural differences might keep them from living together because Spanish is widely spoken by Hispanics which could increase their linguistic isolation from other racial groups. Furthermore, Hispanics and blacks have large cultural differences that may keep them from living together. Hispanics have short immigration history in the U.S. and blacks had lived in America for a longer time than Hispanics.

Next, I review detailed Asian groups. Most of the Asian groups have a high mean exposure to neighborhood education. This means that other factors like language or cultural differences might affect their residential location than educational attainment. Vietnamese and Cambodians have the lowest means. This shows that people from Southeast Asia have lower educational attainment than other Asians in Houston area. Most of the people from Southeast Asia came to America as refugees and had low education from their country than other Asian immigrants who came to America. What is also interesting is that Southeast Asians like Cambodians and Vietnamese have low mean exposure to family income. This suggests that their socioeconomic status affects their residential location. These results imply that educational attainment and family

income affect each other and are relevant factors that affect residential segregation among detailed Asian groups.

Group Contact

The results for exposure to whites for broad racial and ethnic groups are not surprising; it follows the familiar findings of previous studies on residential segregation. Blacks have the lowest exposure to whites and Asians have the highest exposure to whites. This shows that the blacks are more segregated from whites than Asians. Also whites have the largest degree of exposure to their own group caused by their large population size and their preference for living with the whites over other racial and ethnic groups.

The data for detailed Asian groups show that the Japanese (mean is 62.7) have the highest exposure to whites and the Vietnamese (mean is 36.0) and Cambodian (mean is 38.9) have the lowest exposure to whites. This means that Japanese live in neighborhoods and areas in Houston where whites also live. In fact, many Japanese are living in suburban areas in Houston like Katy. On the other hand, Vietnamese or Cambodians live close together in downtown areas where there is an areal center of Vietnamese commerce and business resulting in lower contact with whites. In addition, Vietnamese and Cambodian are more likely to live near or together, since they have similar culture and came from close regions in Southeast Asia.

Whites have the lowest exposure to blacks of any racial and ethnic group. This reflects the ongoing discrimination and prejudice against blacks by whites and other

racial groups. The data for the detailed Asian groups in this table show that the Japanese and Koreans have the lowest exposure to blacks. The reason why Japanese have low exposure to blacks is that Japanese live in suburban areas of Houston like whites. Koreans live in the downtown area like blacks do, but still have low exposure to blacks. This may reflect an uncomfortable relationship after the LA riot. Both Japanese and Koreans seem to have less preference for contact with blacks like other racial and ethnic groups.

The mean exposure to Hispanics is very similar among all broad racial groups that are not Hispanic. Although the mean is lower than the exposure to whites caused by the population size differences, the mean score tends to be similar across groups. This may reflect the milder prejudice or discrimination toward the Hispanic population than other racial groups. Also, the mean exposure among detailed Asian groups looks more even than the mean exposure of other racial groups, even though the means for the Vietnamese and Cambodians are higher than other groups.

The exposure of broad racial and ethnic groups to Asians is lower than their exposure to other racial groups because the population size of Asian is smaller than other racial groups in Houston. The mean exposures of the detailed Asian groups show that the means of Chinese and Taiwanese are the highest while the mean of Cambodian and Japanese are the lowest.

Detailed Asian Comparisons

Table 5.2 shows the mean exposure to detailed Asian groups for detailed Asian groups and ratio of actual contact to MSA population in Houston, Texas. The level of same-group exposure of Asian Indians, Chinese, and Vietnamese are higher. In part, this is because the population sizes of these three groups are larger than other Asian population.

The detailed Asian group's mean exposure to Asian Indians shows that the Pakistanis have the highest mean. This is not surprising because Asian Indians and Pakistanis have similar fluency in English (they are both fluent in English, since both country was under the rule of United Kingdom in the past), and they came from similar regions in the South Asia.

The detailed Asian group's mean exposure for Cambodian and Japanese are hard to compare because the means are almost same and they have relatively small population sizes. The detailed Asian group's mean exposure for Chinese show that the mean of Taiwanese are the highest, since they came from similar regions and have similar culture (Buddhism and Confucianism) and language (Mandarin).

The detailed Asian group's mean exposure for Filipinos shows that the mean of Japanese is the lowest. The detailed Asian group's mean exposure for Korean shows that the mean of Japanese is the highest. This result was a surprise to me because I expected that the mean of Chinese would be the highest. Probably this implies that the uncomfortable feelings of Koreans toward Japanese due to historical conflicts may be diminished in the U.S.

The detailed Asian group's mean exposure for Pakistani shows that the mean of Japanese and Cambodian are the lowest and the mean of Asian Indians are the highest as expected for the same reason above that I described for the detailed Asian group's mean exposure for Asian Indian.

The detailed Asian group's mean exposure for Taiwanese shows that the mean of Vietnamese and Cambodian are the lowest and the mean of Chinese are the highest as expected for the same reason above that I described for the detailed Asian group's mean exposure for Chinese. The detailed Asian group's mean exposure for Vietnamese shows that the mean of Chinese and Cambodian are the highest and the mean of Japanese is the lowest.

Table 5.3 presents selected scores from Table 5.2 to highlight patterns of variation across groups in isolation and relative isolation. Isolation (simple same-group contact) is reported in column (1). It is partly a function of group size, so it is useful to compare it with the expected same group contact in column (2) which is simply the group's percentage in the city population. The ratio of the two figures is reported in column (3) and suggests the extent to which observed isolation is elevated above expected levels. Columns 4 to 6 repeat the exercise but focus on each group's contact with all Asians, not just members of their own group.

Inspection of Table 5.2 shows that most of the diagonals are high. The scores are mostly above 1.0 and several scores are close to 2.0 or higher. This means that scores for relative exposure reflect more than just population size. When we look closer to the summarized scores in Table 5.3, Cambodians, Pakistanis, and Taiwanese have high

relative exposure ratios for their same group, which reflect more than simply their population size. On the other hand, Asian Indians, Filipinos, and Vietnamese have the low relative exposure ratio. Ratios for contact with all Asian groups show that Asian Indians, Chinese, Pakistanis, and Taiwanese have high scores, while Cambodians, Japanese, and Koreans have low scores.

Relationships of Group Characteristics and Residential Outcomes

Selected scatter plots based on data presented in Tables 4.1 and 5.1 are shown in Figures 5.1 to 5.20. These scatter plots show that neighborhood outcomes for groups tend to follow group averages on social characteristics for individuals. In fact, they are highly correlated to each other as I expected from the implications that I discussed in group differences in social characteristics.

Figure 5.1 shows that groups, who have high mean social characteristics on educational attainment, also have high mean residential outcomes on educational attainment too. Although Figure 5.2 seems to be a little bit more scattered than Figure 5.1, the results also show high correlation among the social characteristics on income of each groups and their residential outcomes on income.

Table 5.2 Exposure to Detailed Asian Groups for Detailed Asian Groups and Ratio of Actual Contact to MSA Population

	Exposure ($_XP_Y$)									
Detailed Asian Groups	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	All Asian
(1) Asian Indians	4.28	0.06	3.11	1.29	0.17	0.43	0.89	0.26	2.67	13.78
(2) Cambodian	1.19	1.07	0.92	0.75	0.06	0.21	0.33	0.05	3.19	8.42
(3) Chinese	3.58	0.05	4.77	1.22	0.20	0.50	0.68	0.37	3.16	15.16
(4) Filipino	2.97	0.09	2.45	1.67	0.12	0.37	0.62	0.17	3.09	12.09
(5) Japanese	1.99	0.04	2.06	0.64	0.58	0.82	0.35	0.18	1.33	8.38
(6) Korean	2.15	0.05	2.16	0.80	0.34	1.08	0.42	0.18	2.28	9.92
(7) Pakistani	4.36	0.08	2.89	1.31	0.14	0.41	1.69	0.22	2.86	14.73
(8) Taiwanese	4.06	0.04	5.04	1.13	0.23	0.56	0.71	0.66	2.43	15.50
(9) Vietnamese	2.17	0.13	2.23	1.09	0.09	0.37	0.48	0.13	5.90	13.17
% in Houston Pop (P_Y)	1.11	0.06	0.97	0.48	0.09	0.22	0.23	0.07	1.37	4.84

	Relative Exposure ($_XP_Y/P_Y$)*									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	All Asian
(1) Asian Indians	3.86	1.00	3.21	2.69	1.89	1.95	3.87	3.71	1.95	2.85
(2) Cambodian	1.07	17.83	0.95	1.56	0.67	0.95	1.43	0.71	2.33	1.74
(3) Chinese	3.23	0.83	4.92	2.54	2.22	2.27	2.96	5.29	2.31	3.13
(4) Filipino	2.68	1.50	2.53	3.48	1.33	1.68	2.70	2.43	2.26	2.50
(5) Japanese	1.79	0.67	2.12	1.33	6.44	3.73	1.52	2.57	0.97	1.73
(6) Korean	1.94	0.83	2.23	1.67	3.78	4.91	1.83	2.57	1.66	2.05
(7) Pakistani	3.93	1.33	2.98	2.73	1.56	1.86	7.35	3.14	2.09	3.04
(8) Taiwanese	3.66	0.67	5.20	2.35	2.56	2.55	3.09	9.43	1.77	3.20
(9) Vietnamese	1.95	2.17	2.30	2.27	1.00	1.68	2.09	1.86	4.31	2.72

* Ratio of observed contact to expect contact (i.e., percentage in Houston population)
Source: Summary Files 1 and 3 from U.S. Census 2000 (U.S. Census Bureau 2001a and 2002b)

Table 5.3 Isolation and Relative Isolation for Detailed Asian Groups

	Same Group Contact (1)	Expected Same Group Contact (2)	Ratio (1)/(2) (3)	Contact With All Asians (4)	Expected Contact With All Asians (5)	Ratio (4)/(5) (6)
All Asians	---	---	---	13.36	*4.84	2.76
Asian Indians	4.28	1.11	3.86	13.78	4.84	2.85
Cambodian	1.07	0.06	17.83	8.42	4.84	1.74
Chinese	4.77	0.97	4.92	15.16	4.84	3.13
Filipino	1.67	0.48	3.48	12.09	4.84	2.50
Japanese	0.58	0.09	6.44	8.38	4.84	1.73
Korean	1.08	0.22	4.91	9.92	4.84	2.05
Pakistani	1.69	0.23	7.35	14.73	4.84	3.04
Taiwanese	0.66	0.07	9.43	15.50	4.84	3.20
Vietnamese	5.90	1.37	4.31	13.17	4.84	2.72

*Asian population as percentage of total population =226,177/4,669,571*100=4.84
Source: Summary Files 1 and 3 from U.S. Census 2000 (U.S. Census Bureau 2001a and 2002b)
Note: Table 5.3 summarizes key numbers from Table 5.2

Figures 5.3 and 5.4 show similar correlation. Figure 5.5 shows exposure to whites by average income, which means that racial and ethnic groups with high mean income tend to live near whites in Houston. Other scatter plots related with area percent white has high correlations with both area and group income and education. Although scatter plots for area percent Asian looks more scattered, the high correlations on both area and group income and education are very similar to whites. The scatter plots for both area percent black and Hispanic look similar, which shows that exposure to both blacks and Hispanics are mostly low in Houston based on area and group income and education of all racial groups.

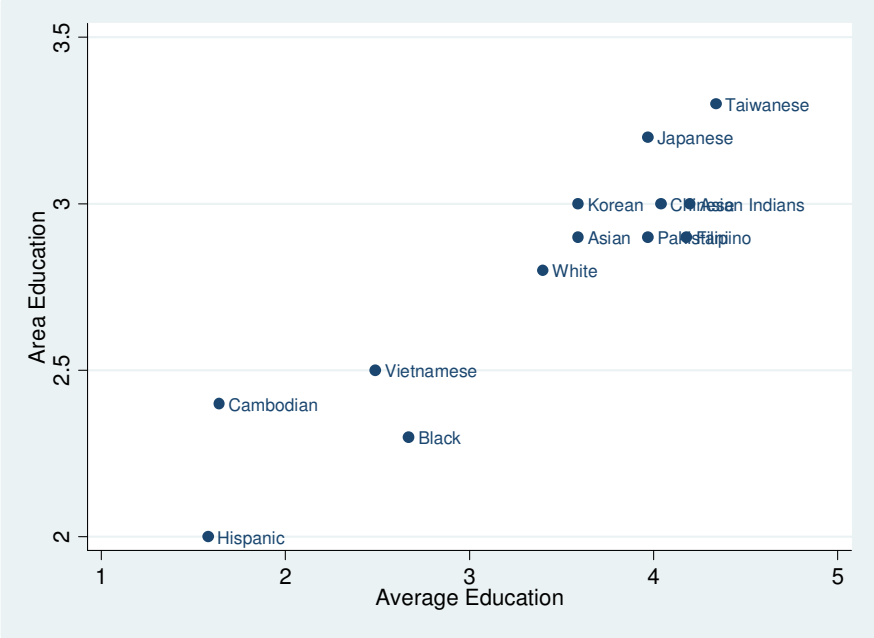

Figure 5.1 Scatter Plot for Area and Average Education for All Groups

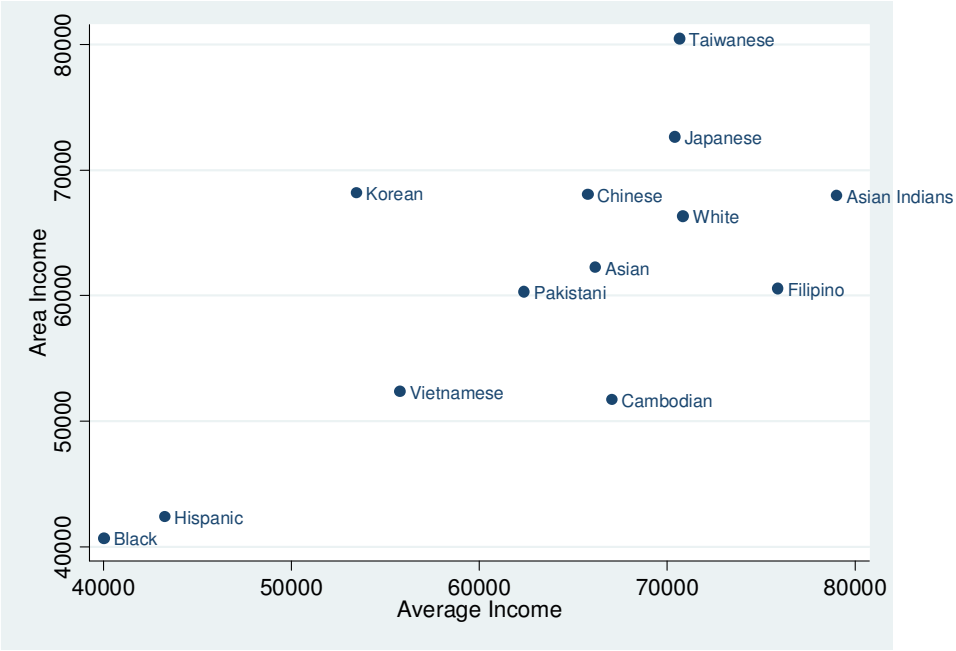

Figure 5.2 Scatter Plot for Area and Average Income for All Groups

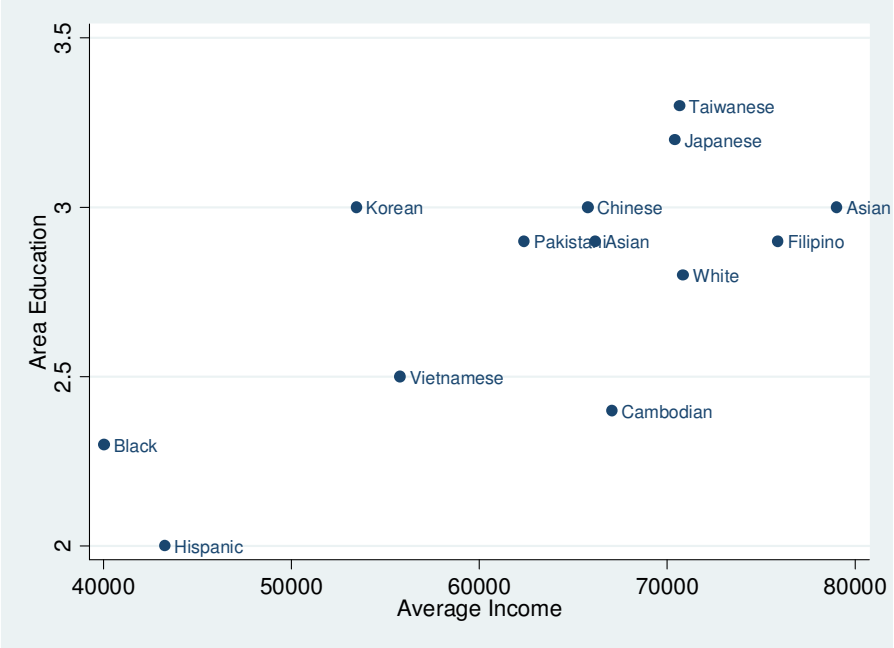

Figure 5.3 Scatter Plot for Area Education and Average Income for All Groups

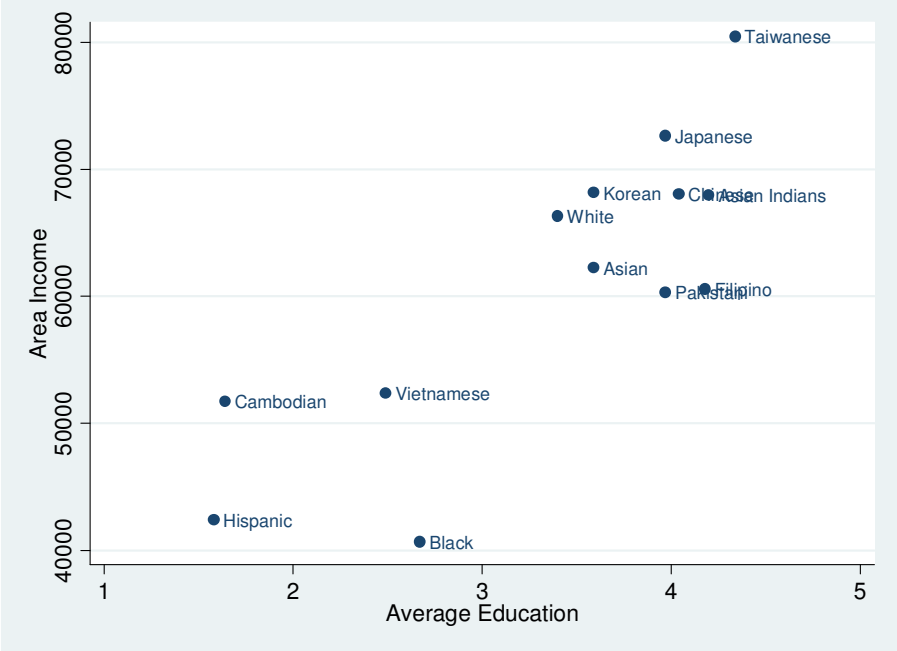

Figure 5.4 Scatter Plot for Area Income and Average Education for All Groups

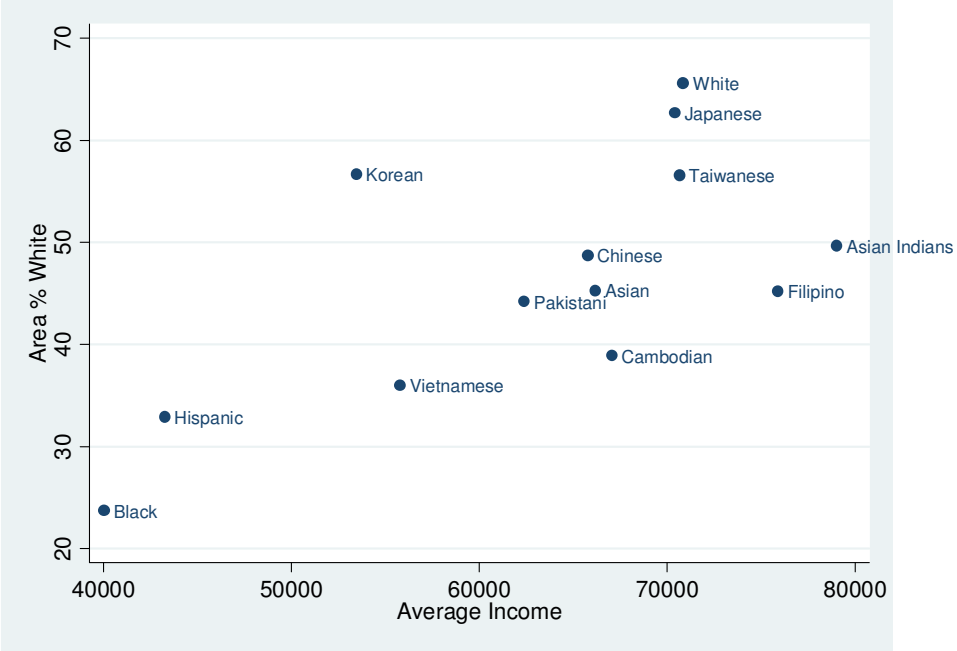

Figure 5.5 Scatter Plot for Area Percentage White and Average Income

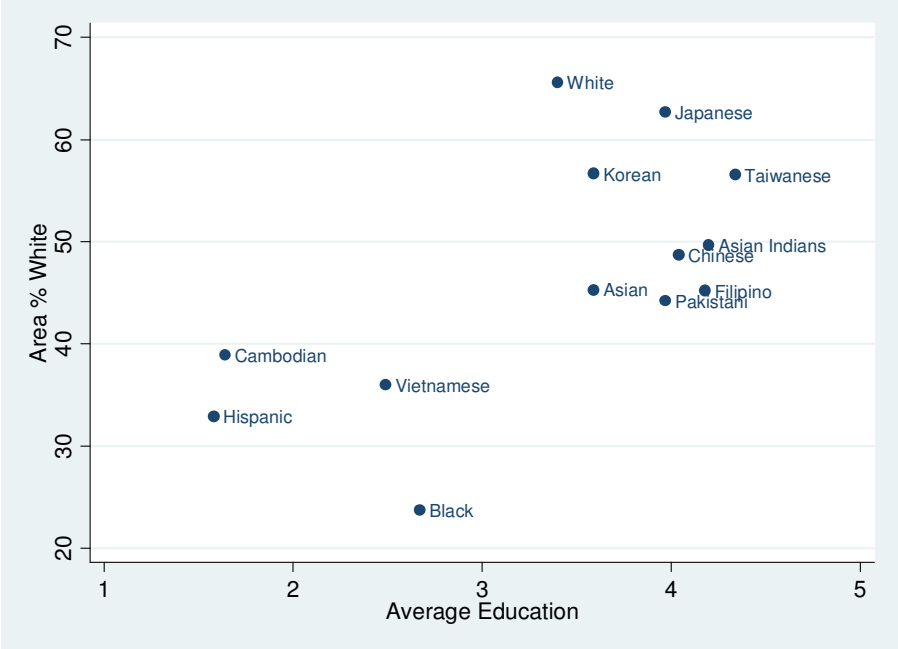

Figure 5.6 Scatter Plot for Area Percentage White and Average Education

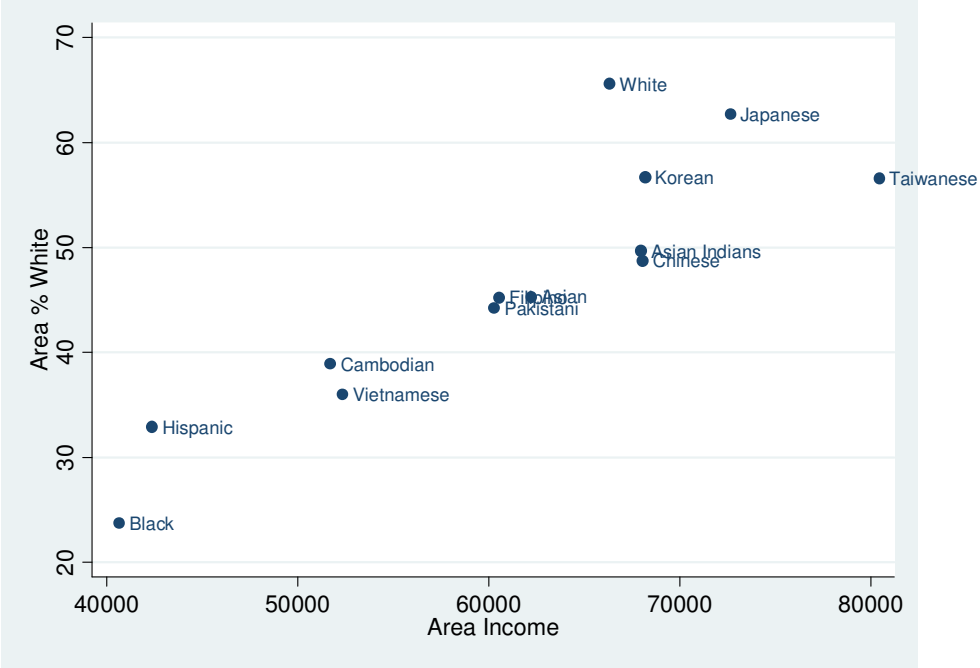

Figure 5.7 Scatter Plot for Area Percentage White and Area Income

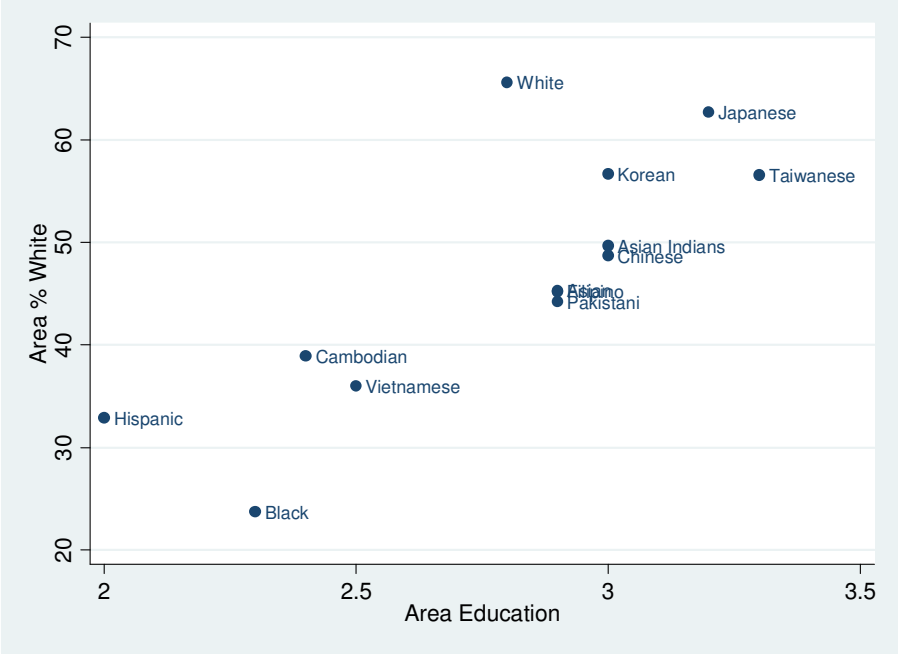

Figure 5.8 Scatter Plot for Area Percentage White and Area Education

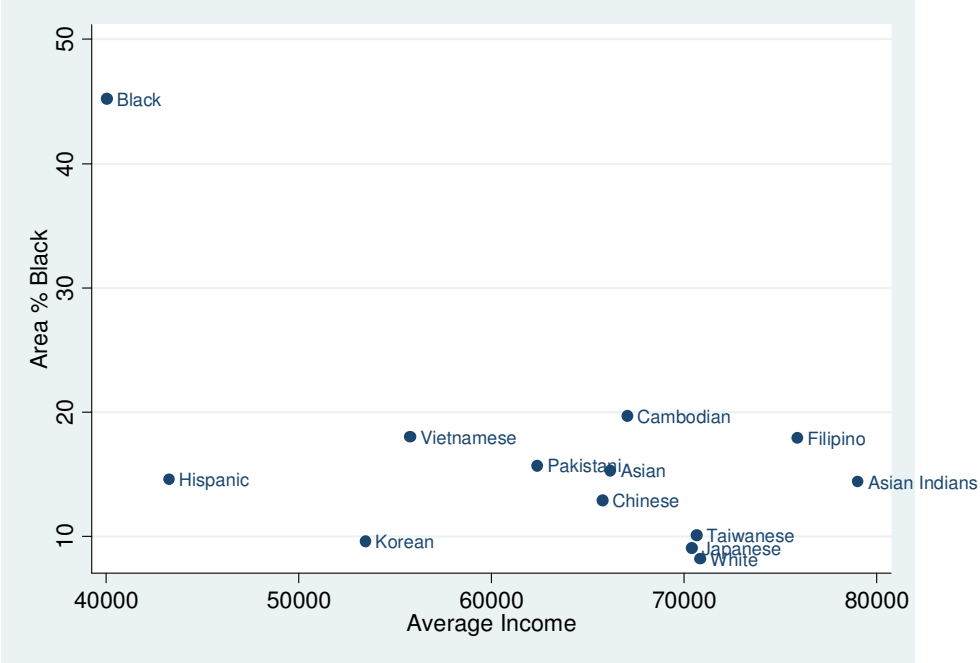

Figure 5.9 Scatter Plot for Area Percentage Black and Average Income

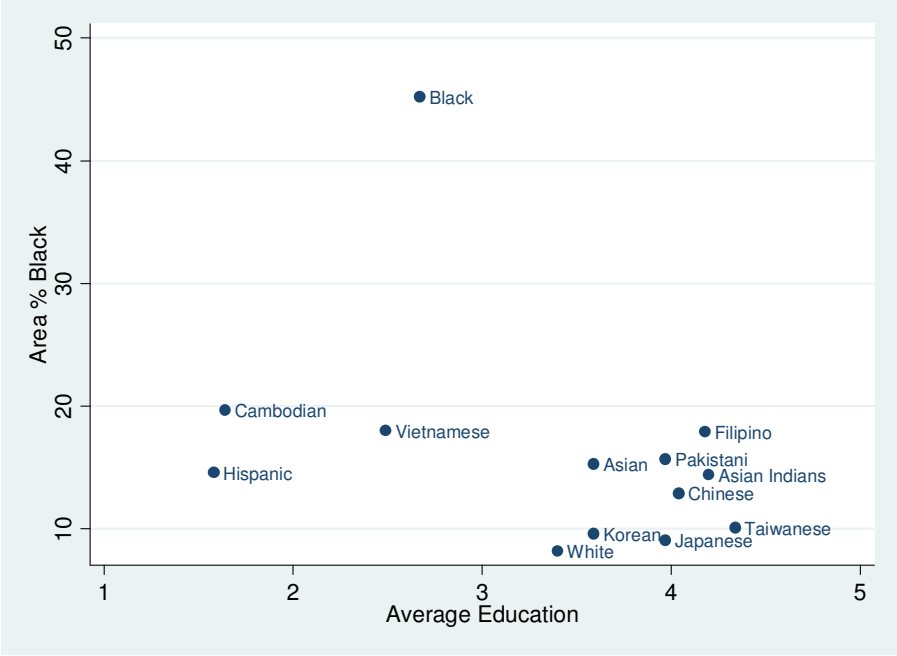

Figure 5.10 Scatter Plot for Area Percentage Black and Average Education

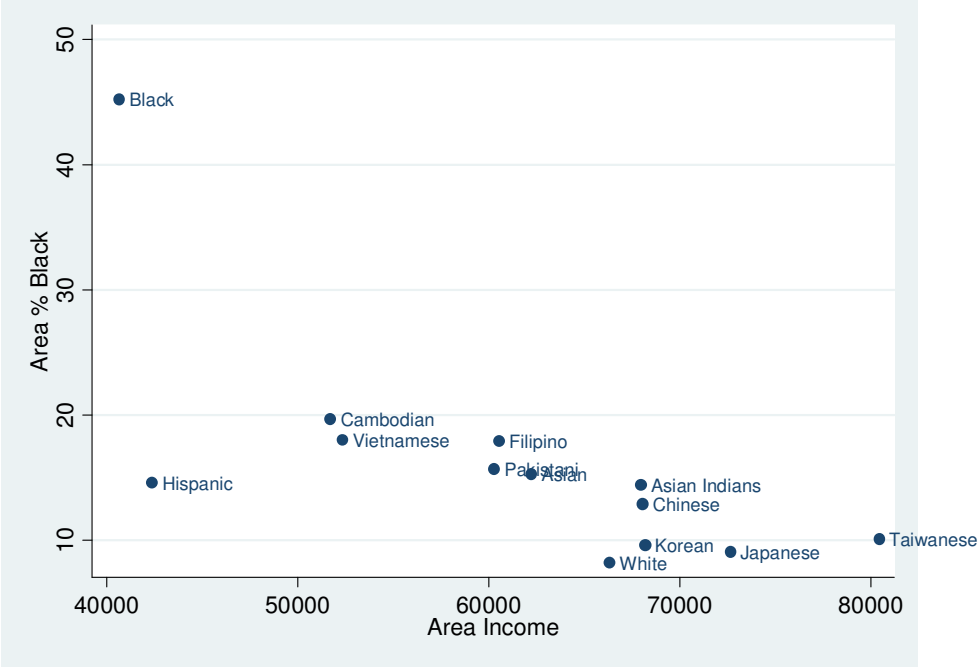

Figure 5.11 Scatter Plot for Area Percentage Black and Area Income

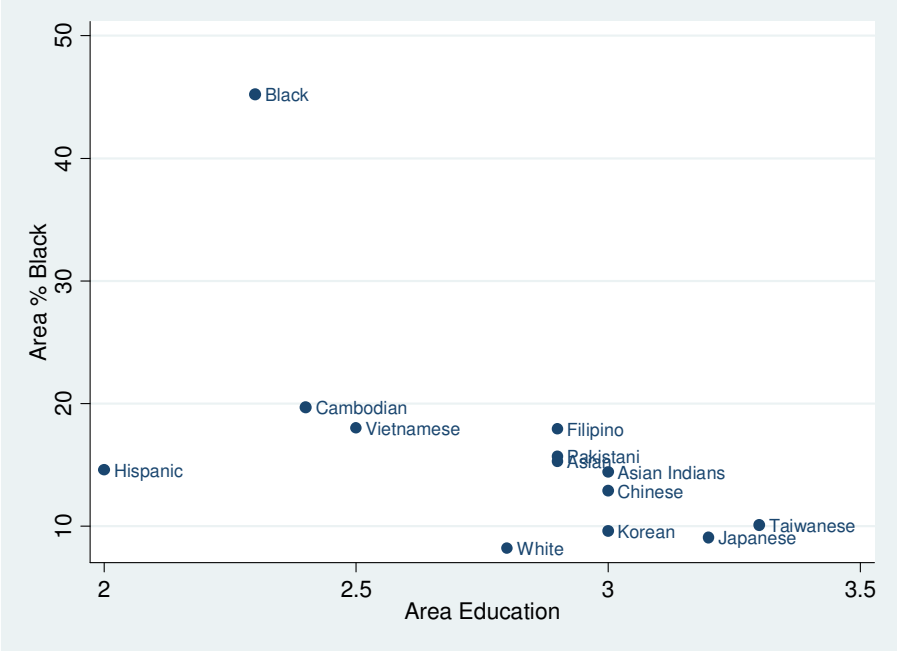

Figure 5.12 Scatter Plot for Area Percentage Black and Area Education

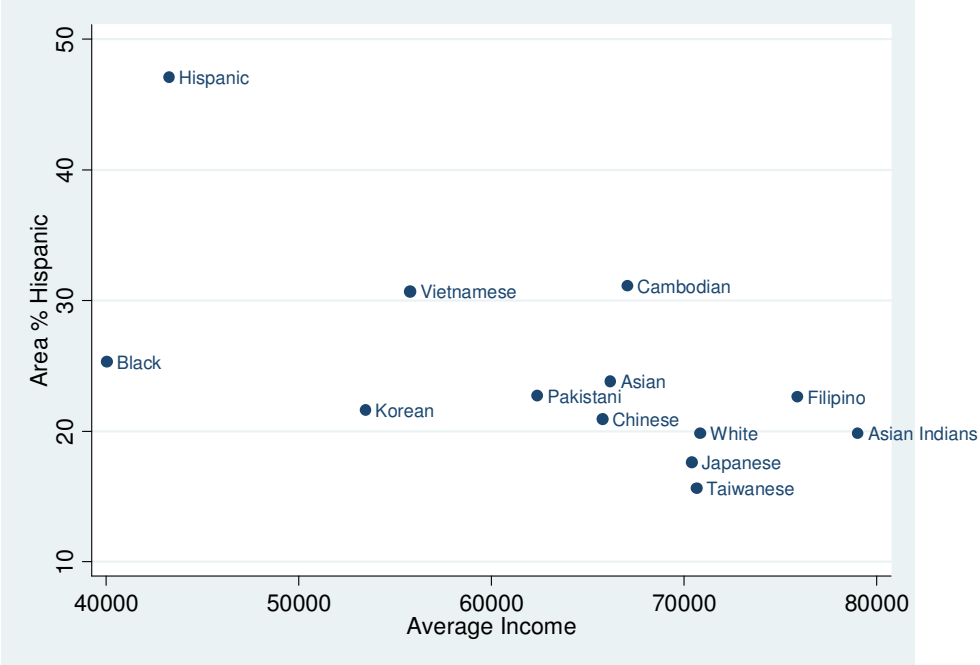

Figure 5.13 Scatter Plot for Area Percentage Hispanic and Average Income

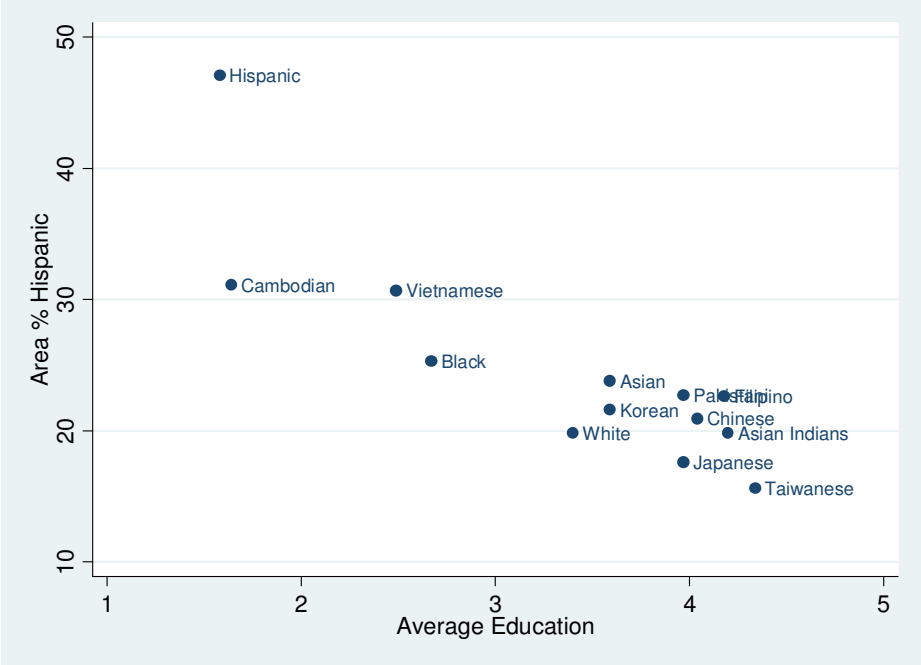

Figure 5.14 Scatter Plot for Area Percentage Hispanic and Average Education

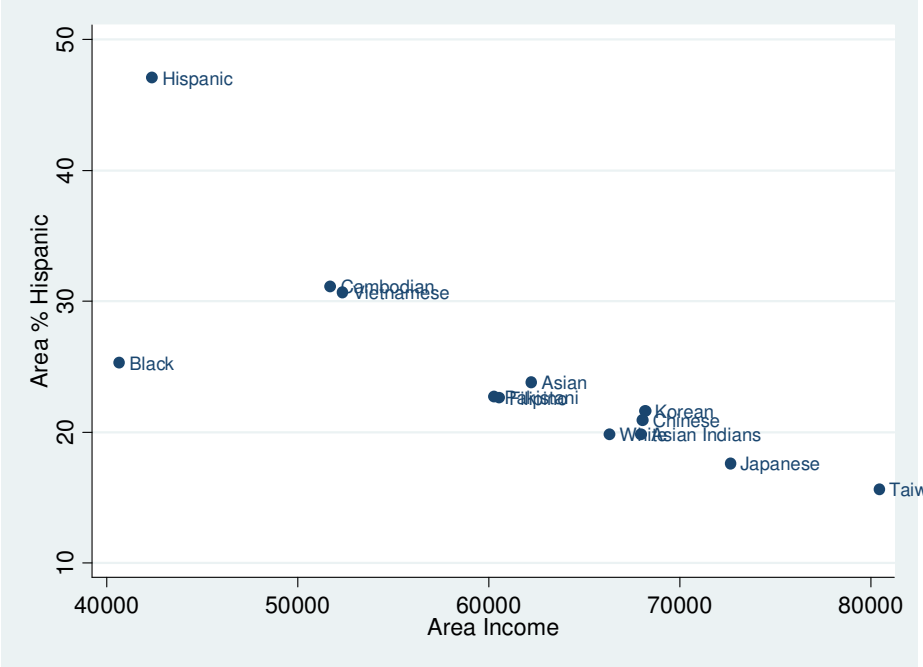

Figure 5.15 Scatter Plot for Area Percentage Hispanic and Area Income

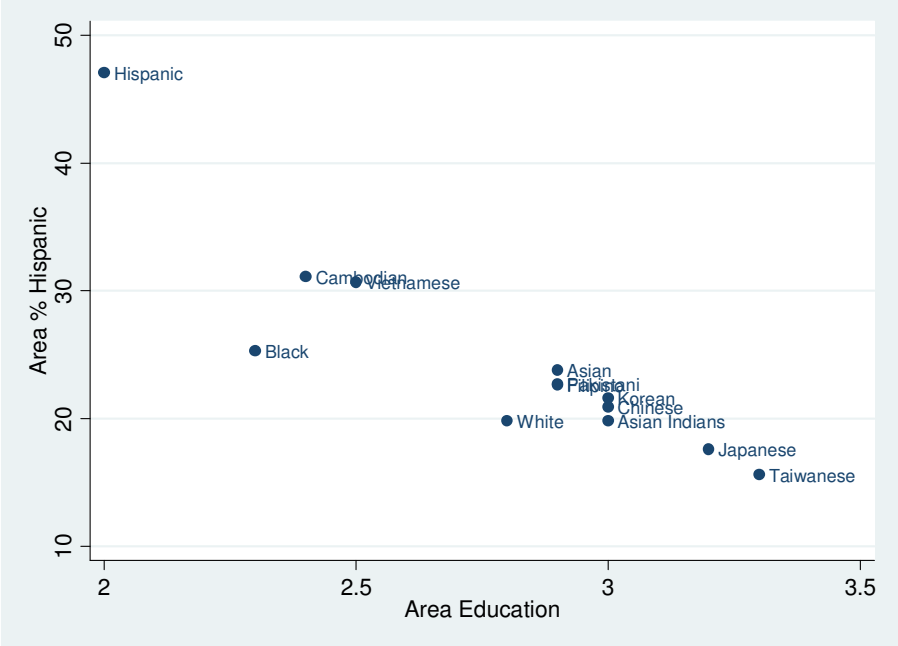

Figure 5.16 Scatter Plot for Area Percentage Hispanic and Area Education

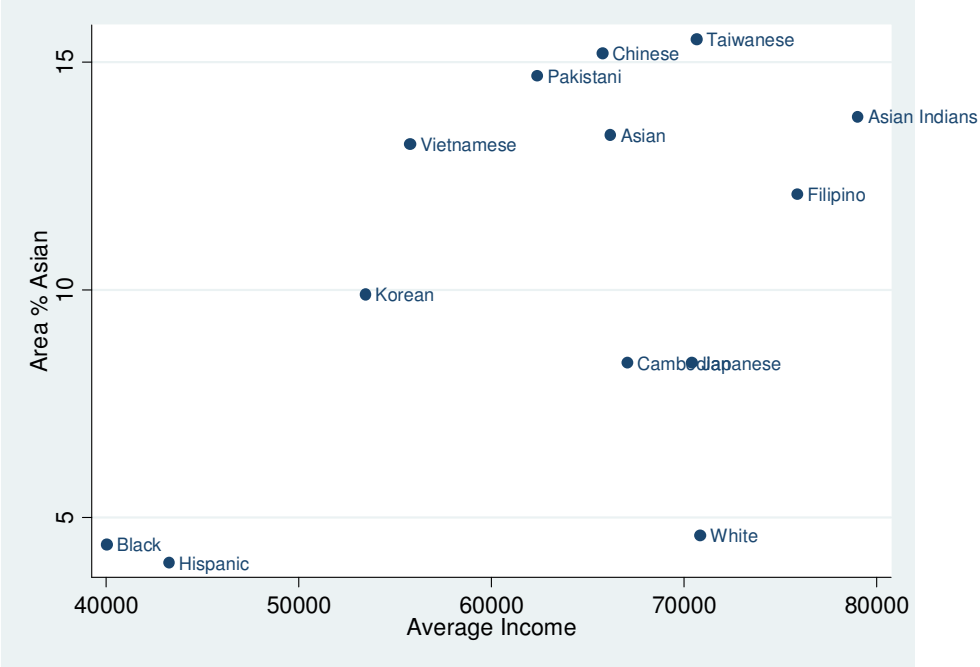

Figure 5.17 Scatter Plot for Area Percentage Asian and Average Income

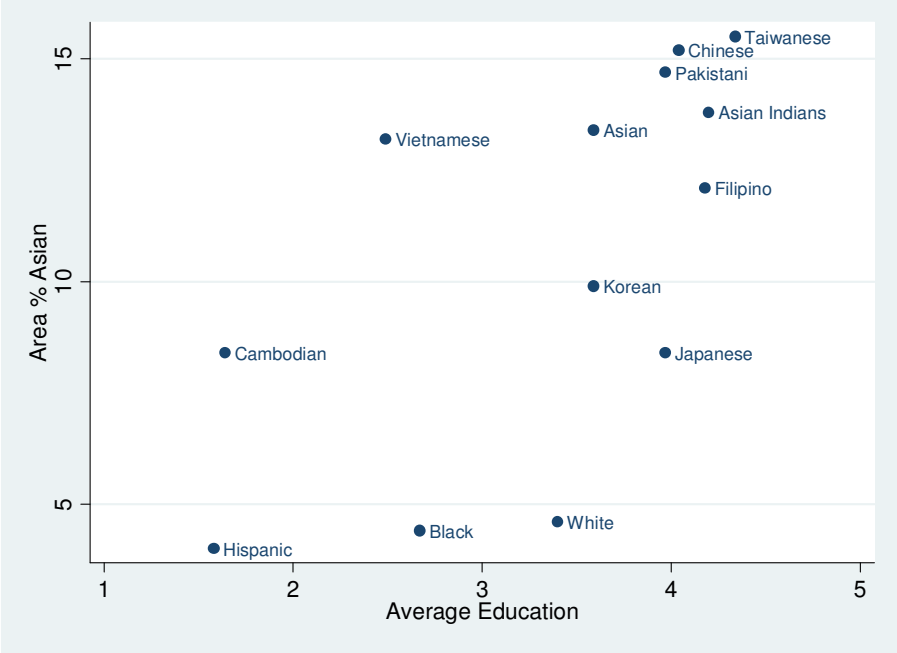

Figure 5.18 Scatter Plot for Area Percentage Asian and Average Education

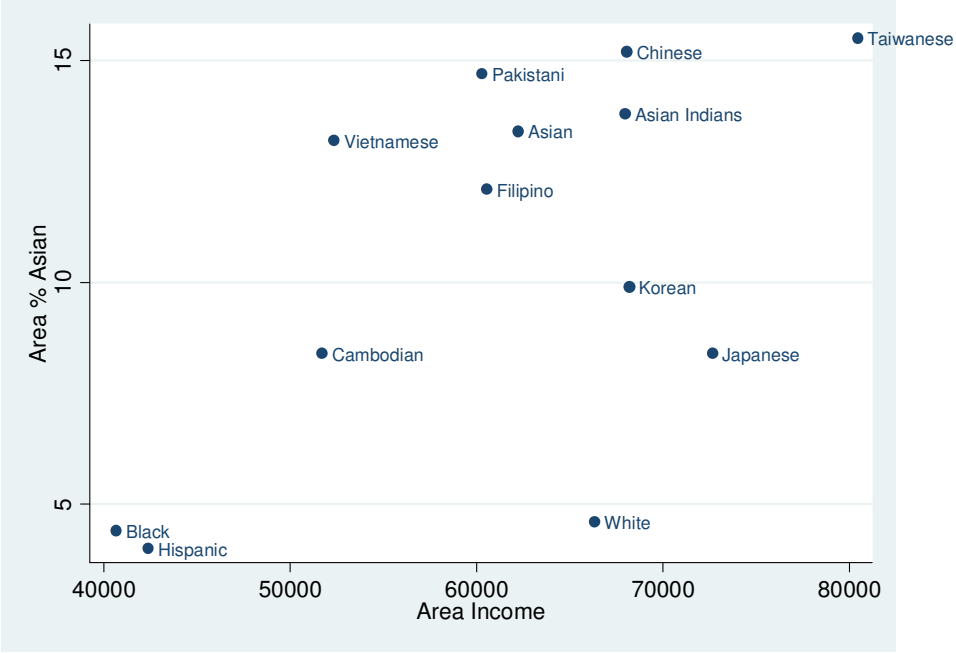

Figure 5.19 Scatter Plot for Area Percentage Asian and Area Income

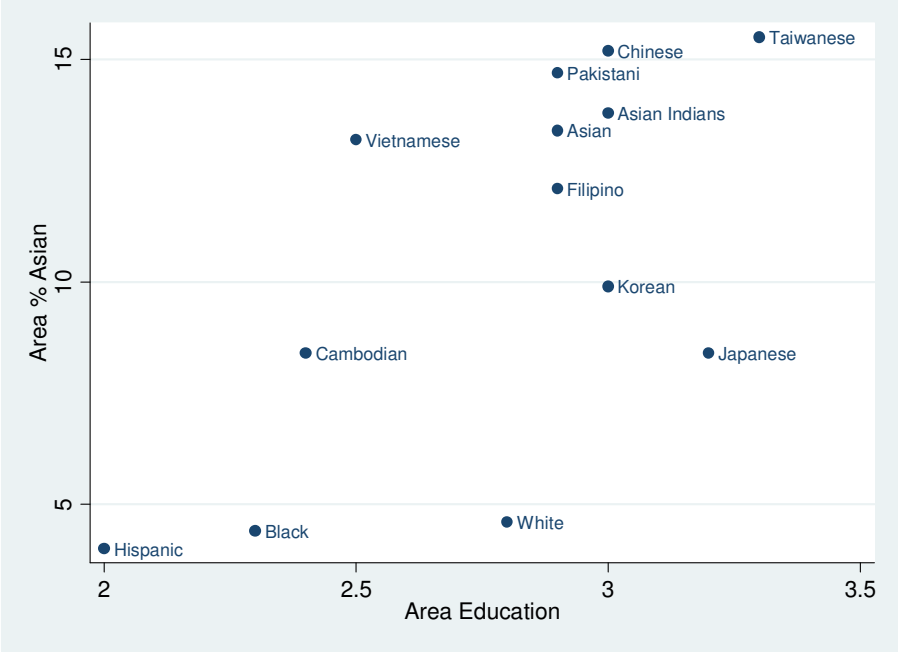

Figure 5.20 Scatter Plot for Area Percentage Asian and Area Education

CHAPTER VI

ANALYSIS OF UNEVEN DISTRIBUTION

In this chapter I review the extent to which groups are unevenly distributed. Uneven distribution is the most widely studied dimension of segregation. I measure uneven distribution using three measures; the index of dissimilarity (D), the variance ratio (V), and the separation index (S). Using these measures I find evidence of substantial segregation involving Asian groups.

Dissimilarity Index (D)

Table 6.1 shows segregation scores based on the dissimilarity index (D). This table is consistent with earlier studies of residential segregation of broad racial and ethnic groups by Massey (2000), Farley and Frey (1993), and Logan (2003). It indicates segregation scores are highest between whites and blacks, and also are high between Asians and blacks. The dissimilarity indices also are relatively high for detailed Asian groups. This is a new finding not previously reported in the literature. Table 6.1 indicates that, in general, Asian subgroups are very segregated from whites, blacks, and Hispanics. But there is variation. For example, with regard to segregation from whites, the scores for the Japanese (46.7), Korean (51.2), Filipinos (52.2), and Asian Indians (52.7) are moderately high. But the scores for the Pakistanis (62.5), Vietnamese (62.6), Taiwanese (66.4), and Cambodians (72.8) are much higher.

These results must be interpreted cautiously. It is well known that the index of dissimilarity is unreliable when used with small groups (Winship 1977, Massey 1978). Table 6.2 presents data which call attention to the underlying problem. Table 6.2 documents that the standard error for group proportions calculated for census tracts are higher for comparisons involving detailed Asian groups. The standard error is based on $\sqrt{(PQ/N)}$. Large values indicate that group proportions will vary widely across census tracts under random assignment. This means that the dissimilarity index is not trustworthy and reliable when focusing on small groups like Asians.

The expected values of dissimilarity are shown in Table 6.3. Following Winship (1977), this table reports the expected dissimilarity (E[D]) under random assignment taking account of each group's size. Note that the scores of the detailed Asian group are high, while the scores for the broad racial and ethnic groups are low. Comparing Tables 6.1 and 6.3 reveals the problems of small population group analysis using dissimilarity indices.

Winship (1977) reports that E[D] can be obtained from $E[D] = \sqrt{[2\pi T_i P(1-P)]}$, where T_i is the number of persons from the two groups in the comparison in each census tracts. This is an approximation based on normal theory. A more accurate value can be obtained based on binomial model. But the formula based on normal theory is useful for showing that E[D] is driven by T_i and PQ. In view of these problems, I examine uneven distribution using two measures, the variance ratio (V) and the separation index (S). Both are less affected by the problems D has when groups are small in size.

Table 6.1 Dissimilarity Index (D) for Segregation Between Racial and Ethnic Groups in Houston Texas, 2000

	White	Black	Hisp.	Asian	AI	CA	CH	FI	JA	KO	PK	TA	VI
White	0.00	65.96	53.35	51.33	52.74	72.75	56.43	52.19	46.67	51.19	62.52	66.40	62.61
Black	65.96	0.00	51.33	61.64	66.34	74.14	69.47	60.54	71.78	71.39	70.14	79.83	62.46
Hisp.	53.35	51.33	0.00	58.31	65.95	71.41	67.96	60.46	64.89	65.02	69.18	79.34	57.60
Asian	51.33	61.64	58.31	0.00	22.65	64.97	26.10	28.96	52.36	42.28	36.34	46.51	30.69
AI	52.74	66.34	65.95	22.65	0.00	72.28	30.23	33.97	52.17	45.48	32.97	46.16	49.13
CA	72.75	74.14	71.41	64.97	72.28	0.00	75.02	67.87	78.95	73.53	74.82	83.08	60.55
CH	56.43	69.47	67.96	26.10	30.23	75.02	0.00	40.64	53.31	47.05	44.57	35.71	49.18
FI	52.19	60.54	60.46	28.96	33.97	67.87	40.64	0.00	58.73	50.79	41.78	56.75	43.89
JA	46.67	71.78	64.89	52.36	52.17	78.95	53.31	58.73	0.00	43.67	63.06	59.11	66.74
KO	51.19	71.39	65.02	42.28	45.48	73.53	47.05	50.79	43.67	0.00	56.71	56.24	55.57
PK	62.52	70.14	69.18	36.34	32.97	74.82	44.57	41.78	63.06	56.71	0.00	55.95	53.98
TA	66.40	79.83	79.34	46.51	46.16	83.08	35.71	56.75	59.11	56.24	55.95	0.00	64.99
VI	62.61	62.46	57.60	30.69	49.13	60.55	49.18	43.89	66.74	55.57	53.98	64.99	0.00

Source: Summary File 1, U.S. Census of Population 2000 (U.S. Census Bureau 2001a)

Note: Group names are abbreviated as follows: Hisp. is an abbreviation for Hispanic, AI is an abbreviation for Asian Indians, CA is an abbreviation for Cambodians, CH is an abbreviation for Chinese, FI is an abbreviation for Filipinos, JA is an abbreviation for Japanese, KO is an abbreviation for Koreans, PK is an abbreviation for Pakistanis, TA is an abbreviation for Taiwanese, and VI is an abbreviation for Vietnamese.

Table 6.2 Standard Error for Tract-Level Pair-Wise Proportions for Segregation Between Racial and Ethnic Groups in Houston Texas, 2000

	White	Black	Hisp.	Asian	AI	CA	CH	FI	JA	KO	PK	TA	VI
White	0.00	0.75	0.76	0.55	0.29	0.07	0.27	0.20	0.09	0.13	0.14	0.08	0.32
Black	0.75	0.00	0.98	1.24	0.79	0.20	0.75	0.55	0.25	0.38	0.39	0.22	0.86
Hisp.	0.76	0.98	0.00	0.83	0.48	0.11	0.45	0.32	0.14	0.22	0.22	0.13	0.52
Asian	0.55	1.24	0.83	0.00	2.20	0.67	2.13	1.71	0.84	1.25	1.27	0.75	2.29
AI	0.29	0.79	0.48	2.20	0.00	2.74	4.76	5.01	3.34	4.44	4.47	3.02	4.35
CA	0.07	0.20	0.11	0.67	2.74	0.00	3.11	5.76	17.31	10.52	10.32	19.08	2.25
CH	0.27	0.75	0.45	2.13	4.76	3.11	0.00	5.39	3.78	4.92	4.95	3.43	4.44
FI	0.20	0.55	0.32	1.71	5.01	5.76	5.39	0.00	6.68	7.63	7.63	6.22	4.44
JA	0.09	0.25	0.14	0.84	3.34	17.31	3.78	6.68	0.00	11.21	11.03	16.85	2.77
KO	0.13	0.38	0.22	1.25	4.44	10.52	4.92	7.63	11.21	0.00	10.28	10.94	3.78
PK	0.14	0.39	0.22	1.27	4.47	10.32	4.95	7.63	11.03	10.28	0.00	10.75	3.81
TA	0.08	0.22	0.13	0.75	3.02	19.08	3.43	6.22	16.85	10.94	10.75	0.00	2.50
VI	0.32	0.86	0.52	2.29	4.35	2.25	4.44	4.44	2.77	3.78	3.81	2.50	0.00

Source: Summary File 1, U.S. Census of Population 2000 (U.S. Census Bureau 2001a)

Note: Group names are abbreviated as follows: Hisp. is an abbreviation for Hispanic, AI is an abbreviation for Asian Indians, CA is an abbreviation for Cambodians, CH is an abbreviation for Chinese, FI is an abbreviation for Filipinos, JA is an abbreviation for Japanese, KO is an abbreviation for Koreans, PK is an abbreviation for Pakistanis, TA is an abbreviation for Taiwanese, and VI is an abbreviation for Vietnamese.

Table 6.3 Expected Value (E[D]) for Segregation Between Racial and Ethnic Groups in Houston Texas, 2000

	White	Black	Hisp.	Asian	AI	CA	CH	FI	JA	KO	PK	TA	VI
White	0.00	1.53	1.25	2.59	5.26	23.24	5.64	7.98	18.19	11.76	11.59	20.64	4.75
Black	1,53	0.00	1.65	2.81	5.38	23.27	5.75	8.05	18.22	11.81	11.64	20.67	4.88
Hisp.	1.25	1.65	0.00	2.67	5.30	23.25	5.68	8.00	18.20	11.77	11.61	20.65	4.80
Asian	2.59	2.81	2.67	0.00	5.78	23.36	6.12	8.32	18.35	11.99	11.84	20.78	5.31
AI	5.26	5.38	5.30	5.78	0.00	23.81	7.65	9.51	18.92	12.85	12.70	21.29	7.02
CA	23.24	23.27	23.25	23.36	23.81	0.00	23.90	24.10	32.00	26.40	26.86	33.97	23.70
CH	5.64	5.75	5.68	6.12	7.65	23.90	0.00	9.72	19.02	13.01	12.86	21.38	7.31
FI	7.98	8.05	8.00	8.32	9.51	24.10	9.72	0.00	19.81	14.21	14.03	22.16	9.24
JA	18.19	18.22	18.20	18.35	18.92	32.00	19.02	19.81	0.00	22.12	22.35	29.34	18.78
KO	11.76	11.81	11.77	11.99	12.85	26.40	13.01	14.21	22.12	0.00	16.78	24.33	12.65
PK	11.59	11.64	11.61	11.84	12.70	26.86	12.86	14.03	22.35	16.78	0.00	24.59	12.49
TA	20.64	20.67	20.65	20.78	21.29	33.97	21.38	22.16	29.34	24.33	24.59	0.00	21.16
VI	4.75	4.88	4.80	5.31	7.02	23.70	7.31	9.24	18.78	12.65	12.49	21.16	0.00

Source: Summary File 1, U.S. Census of Population 2000 (U.S. Census Bureau 2001a)

Note: Group names are abbreviated as follows: Hisp. is an abbreviation for Hispanic, AI is an abbreviation for Asian Indians, CA is an abbreviation for Cambodians, CH is an abbreviation for Chinese, FI is an abbreviation for Filipinos, JA is an abbreviation for Japanese, KO is an abbreviation for Koreans, PK is an abbreviation for Pakistanis, TA is an abbreviation for Taiwanese, and VI is an abbreviation for Vietnamese.

Variance Ratio (V)

Scores for the variance ratio (V), an alternative to the dissimilarity index, are shown in Table 6.4. The variance ratio is a well known measure of uneven distribution discussed by Duncan and Duncan (1955), White (1986), and Massey and Denton (1988). It is best known for an interpretation based on the association of tract and the binomial variable (0,1) for race. Also based on this interpretation, it is known as eta squared and the correlation ratio.

Becker, McPartland, and Thomas (1978) show that V also supports other appealing interpretations. One is the proportional under-representation of one group in the environment of the average member of another group (Becker, McPartland, and Thomas 1978: 349). Another is that V is a simple difference in group contact ($V = {}_XP_X - {}_YP_X$)[6]. This interpretation is especially interesting because of close parallels with the separation index discussed below.

The results for V are often different from the results for D. In general, scores for V are lower than scores for D. Allowing for that, V ranks segregation among major groups in a manner similar to D. For example, the highest segregation is between whites and blacks (50.4) with white-Hispanic segregation (35.2) and white-Asian segregation (19.3) somewhat lower.

V is much different in comparisons involving detailed Asian groups. Segregation from whites is very low for the Japanese (0.8), the Taiwanese (1.2), and Koreans (1.6) and only a bit higher for the Chinese (10.6) and the Vietnamese (17.2).

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[6] In this case, the contact scores ${}_XP_X$ and ${}_YP_X$ are calculated using only counts for the two groups in the comparison.

V varies widely when applied to comparisons involving Asian subgroups. Some comparisons show low levels of segregation – for example Chinese-Taiwanese (5.9), Asian Indians-Taiwanese (10.3) and Asian Indians-Pakistanis (11.3). Other comparisons are very high; Cambodians with Pakistanis (58.8), Japanese (69.2), and Taiwanese (76.6).

Winship (1977) shows that, like D, V also can be problematic when group size is small. The expected value of V under random assignment (E[V]) is given by a relatively simple expression, E[V] = 1/N, where N is the combined population per tract. This makes it clear that group size is the only relevant factor. In contrast, D is also affected by PQ.

Table 6.5 shows that E[V] varies considerably across comparisons and sometimes reaches fairly high values (>5). This makes V difficult to compare with confidence. In view of this, I also consider a new measure proposed by Fossett (2007) – the Separation Index (S) – which is better suited for assessing segregation involving small groups.

Table 6.4 Variance Ratio (V) for Segregation Between Racial and Ethnic Groups in Houston Texas, 2000

	White	Black	Hisp.	Asian	AI	CA	CH	FI	JA	KO	PK	TA	VI
White	0.00	50.42	35.18	19.27	7.79	5.30	10.58	4.66	0.79	1.59	5.41	1.22	17.17
Black	50.42	0.00	34.46	35.71	24.17	9.23	28.23	8.87	13.94	16.66	10.00	12.87	21.10
Hisp.	35.18	34.46	0.00	27.28	18.34	3.99	20.19	6.98	5.48	6.70	7.42	7.07	12.36
Asian	19.27	35.71	27.28	0.00	4.81	10.78	5.71	5.10	5.24	6.43	4.96	2.60	8.96
AI	7.79	24.17	18.34	4.81	0.00	39.72	15.30	16.22	19.51	23.57	11.33	10.25	31.47
CA	5.30	9.23	3.99	10.78	39.72	0.00	44.98	42.56	69.15	59.63	58.84	76.60	26.23
CH	10.58	28.23	20.19	5.71	15.30	44.98	0.00	22.65	20.16	24.50	23.14	5.91	30.85
FI	4.66	8.87	6.98	5.10	16.22	42.56	22.65	0.00	34.22	32.25	24.78	30.03	22.45
JA	0.79	13.94	5.48	5.24	19.51	69.15	20.16	20.16	0.00	23.96	46.23	44.72	32.71
KO	1.59	16.66	6.70	6.43	23.57	59.63	24.50	24.50	23.96	0.00	40.80	34.13	28.58
PK	5.41	10.00	7.42	4.96	11.33	58.84	23.14	23.14	46.23	40.80	0.00	35.17	27.26
TA	1.22	12.87	7.07	2.60	10.25	76.60	5.91	5.91	44.72	34.13	35.17	0.00	24.15
VI	17.17	21.10	12.36	8.96	31.47	26.23	30.85	30.85	32.71	28.58	27.26	24.15	0.00

Source: Summary File 1, U.S. Census of Population 2000 (U.S. Census Bureau 2001a)

Note: Group names are abbreviated as follows: Hisp. is an abbreviation for Hispanic, AI is an abbreviation for Asian Indians, CA is an abbreviation for Cambodians, CH is an abbreviation for Chinese, FI is an abbreviation for Filipinos, JA is an abbreviation for Japanese, KO is an abbreviation for Koreans, PK is an abbreviation for Pakistanis, TA is an abbreviation for Taiwanese, and VI is an abbreviation for Vietnamese.

Table 6.5 Expected Value (E[V]) for Segregation Between Racial and Ethnic Groups in Houston Texas, 2000

	White	Black	Hisp.	Asian	AI	CA	CH	FI	JA	KO	PK	TA	VI
White	0.00	0.03	0.02	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Black	0.03	0.00	0.04	0.09	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Hisp.	0.02	0.04	0.00	0.06	0.06	0.07	0.06	0.06	0.07	0.07	0.07	0.07	0.06
Asian	0.04	0.09	0.06	0.00	0.32	0.39	0.33	0.36	0.38	0.37	0.37	0.39	0.31
AI	0.04	0.11	0.06	0.32	0.00	1.62	0.91	1.19	1.57	1.42	1.42	1.60	0.76
CA	0.04	0.11	0.07	0.39	1.62	0.00	1.85	3.52	12.72	6.82	6.67	14.76	1.33
CH	0.04	0.11	0.06	0.33	0.91	1.85	0.00	1.31	1.79	1.60	1.59	1.83	0.81
FI	0.04	0.11	0.06	0.36	1.19	3.52	1.31	0.00	3.30	2.70	2.67	3.43	1.03
JA	0.04	0.11	0.07	0.38	1.57	12.72	1.79	3.30	0.00	6.04	5.93	11.54	1.30
KO	0.04	0.11	0.07	0.37	1.42	6.82	1.60	2.70	6.04	0.00	4.22	6.47	1.19
PK	0.04	0.11	0.07	0.37	1.42	6.67	1.59	2.67	5.93	4.22	0.00	6.33	1.19
TA	0.04	0.11	0.07	0.39	1.60	14.76	1.83	3.43	11.54	6.47	6.33	0.00	1.32
VI	0.04	0.11	0.06	0.31	0.76	1.33	0.81	1.03	1.30	1.19	1.19	1.32	0.00

Source: Summary File 1, U.S. Census of Population 2000 (U.S. Census Bureau 2001a)

Note: Group names are abbreviated as follows: Hisp. is an abbreviation for Hispanic, AI is an abbreviation for Asian Indians, CA is an abbreviation for Cambodians, CH is an abbreviation for Chinese, FI is an abbreviation for Filipinos, JA is an abbreviation for Japanese, KO is an abbreviation for Koreans, PK is an abbreviation for Pakistanis, TA is an abbreviation for Taiwanese, and VI is an abbreviation for Vietnamese.

The Separation Index (S)

Like V, the separation index (S) can be interpreted as a measure of group difference in contact. In contrast to V, however, the expected value of S (i.e., E[S]) is always zero. The separation index (S) is unbiased because individuals are not counted as having contact with themselves. Therefore, it is possible to assess and compare the residential segregation of broad racial groups and detailed Asian groups based on their contact with each other.

The separation index scores for broad racial and ethnic groups are similar to the results for D and V. But the separation index scores for detailed Asian groups are lower than scores for V and D. In general, scores on S below 20 are low and scores from 20 to 50 are moderate, and scores above 50 are high in S measure.

As expected, the scores for S in Table 6.6 between whites and blacks (50.4) is the highest and scores for S between whites and Asians (19.2) is the lowest, since whites and blacks have large differences in both education and income while whites and Asians have similarity in both education and income. However, it seems that the high scores for S between whites and blacks is more affected by income than education. This could be explained as follows. Although whites and Hispanics have huge differences on education and income like blacks, S is lower between whites and Hispanics than between whites and blacks, which may have been caused by the relatively smaller differences in income than education. Most of the detailed Asian population groups have high S scores with blacks and low scores with whites.

It is not surprising that S between Taiwanese and Cambodian (74.3) is the highest and S between Taiwanese and Chinese (4.9) is the lowest. The main reason why S between Taiwanese and Cambodians is high is that they have the largest differences on education and income. In both Table 4.1 and 5.1 shows that the Taiwanese have the highest mean education and income, while Cambodians have the lowest mean education and income. Another reason why S between the Taiwanese and the Chinese is the lowest is that they have similar culture reflecting their similar values regarding education and they also use a similar language. The next highest scores for S are Cambodians with the Japanese (65.5), Koreans (57.2), and Pakistanis (56.7). This follows education differences. But the high score between Cambodian and Pakistani might be also affected by their large differences in linguistic isolation.

Table 6.7 presents data documenting the components of the Separation Index. The top panel presents scores for ${}_{X}P_{X}$-the contact the reference group had with itself in the pair wise comparison. The bottom panel presents scores for ${}_{Y}P_{X}$ – the contact the comparison group had with the reference group. S is given by the difference of these terms ($S={}_{X}P_{X} - {}_{Y}P_{X}$).

Table 6.6 Separation Index (S) –Simple Contact Difference ($_XP_X$-$_YP_X$) for Segregation Between Racial and Ethnic Groups in Houston Texas, 2000

	White	Black	Hisp.	Asian	AI	CA	CH	FI	JA	KO	PK	TA	VI
White	---	50.40	35.16	19.23	7.75	5.22	10.54	4.61	0.73	1.55	5.37	1.18	17.13
Black	50.40	---	34.43	35.63	24.03	8.99	28.09	8.66	13.48	16.36	9.81	12.49	20.98
Hisp.	35.16	34.43	---	27.24	18.26	3.91	20.11	6.89	5.32	6.58	7.32	6.90	12.30
Asian	19.23	35.63	27.24	---	4.55	10.35	5.46	4.70	4.49	6.02	4.70	2.37	8.73
AI	7.75	24.03	18.26	4.55	---	38.38	14.65	15.27	17.12	22.29	10.48	9.32	30.99
CA	5.22	8.99	3.91	10.35	38.38	---	43.47	40.77	65.51	57.21	56.73	74.30	25.17
CH	10.54	28.09	20.11	5.46	14.65	43.47	---	21.66	17.45	23.06	22.20	4.93	30.35
FI	4.61	8.66	6.89	4.70	15.27	40.77	21.66	---	31.03	30.42	23.42	28.51	21.62
JA	0.73	13.48	5.32	4.49	17.12	65.51	17.45	31.03	---	19.22	42.59	40.36	30.47
KO	1.55	16.36	6.58	6.02	22.29	57.21	23.06	30.42	19.22	---	38.86	31.59	27.37
PK	5.37	9.81	7.32	4.70	10.48	56.73	22.20	23.42	42.59	38.86	---	32.88	26.48
TA	1.18	12.49	6.90	2.37	9.32	74.30	4.93	28.51	40.36	31.59	32.88	---	23.12
VI	17.13	20.98	12.30	8.73	30.99	25.17	30.35	21.62	30.47	27.37	26.48	23.12	---

Source: Summary File 1, U.S. Census of Population 2000 (U.S. Census Bureau 2001a)

Note: Group names are abbreviated as follows: Hisp. is an abbreviation for Hispanic, AI is an abbreviation for Asian Indians, CA is an abbreviation for Cambodians, CH is an abbreviation for Chinese, FI is an abbreviation for Filipinos, JA is an abbreviation for Japanese, KO is an abbreviation for Koreans, PK is an abbreviation for Pakistanis, TA is an abbreviation for Taiwanese, and VI is an abbreviation for Vietnamese.

Table 6.7 Components of the Simple Contact Difference (SCD) Version of the Separation Index (S) – Reference Group Contact with Reference Group ($_XP_X$) and Comparison Group Contact with Reference Group ($_YP_X$) for Segregation Between Racial and Ethnic Groups in Houston Texas, 2000

	Reference Group Contact with Reference Group ($_XP_X$)												
	White	Black	Hisp.	Asian	AI	CA	CH	FI	JA	KO	PK	TA	VI
White	---	87.21	75.63	92.59	97.91	99.89	98.23	99.05	99.81	99.55	99.55	99.85	97.70
Black	63.20	---	58.43	85.51	95.25	99.69	96.60	97.44	99.52	98.90	98.78	99.62	94.00
Hisp.	59.53	76.00	---	89.55	96.97	99.81	97.41	98.47	99.70	99.29	99.28	99.77	96.03
Asian	26.64	50.12	37.69	---	82.17	98.96	84.26	91.38	98.21	95.89	95.72	98.57	79.89
AI	9.84	28.78	21.30	22.38	---	97.01	60.31	74.42	93.67	87.12	84.79	94.50	61.93
CA	5.33	9.30	4.10	11.39	41.37	---	46.60	47.03	78.81	65.98	65.35	85.63	28.15
CH	12.31	32.03	22.70	21.20	54.35	96.87	---	73.98	92.84	85.69	85.18	93.42	59.19
FI	5.56	11.22	8.42	13.32	40.85	93.75	47.68	---	88.93	78.08	75.38	90.70	42.01
JA	0.92	13.96	5.62	6.28	23.45	86.71	24.61	42.09	---	42.87	58.92	73.50	34.84
KO	2.00	17.46	7.29	10.13	35.17	91.23	37.37	52.34	76.35	---	68.90	83.14	37.47
PK	5.81	11.02	8.05	8.98	25.69	91.38	37.02	48.04	83.67	69.96	---	83.90	36.96
TA	1.32	12.87	7.14	3.80	14.82	88.67	11.51	37.81	66.86	48.45	48.98	---	26.96
VI	19.43	26.97	16.27	28.84	69.06	97.03	71.16	79.61	95.62	89.90	89.52	96.16	---

Table 6.7 Continued

	Comparison Group Contact with Reference Group ($_YP_X$)												
	White	Black	Hisp.	Asian	AI	CA	CH	FI	JA	KO	PK	TA	VI
White	---	36.80	40.47	73.36	90.16	94.67	87.69	94.44	99.08	98.00	94.19	98.68	80.57
Black	12.79	---	24.00	49.88	71.22	90.70	67.97	88.78	86.04	82.54	88.98	87.13	73.03
Hisp.	24.37	41.57	---	62.31	78.70	95.90	77.30	91.58	94.38	92.71	91.95	92.86	83.73
Asian	7.41	14.49	10.45	---	77.62	88.61	78.80	86.68	93.72	89.87	91.02	96.20	71.16
AI	2.09	4.75	3.03	17.83	---	58.63	45.65	59.15	76.55	64.83	74.31	85.18	30.94
CA	0.11	0.31	0.19	1.04	2.99	---	3.13	6.25	13.29	8.77	8.62	11.33	2.97
CH	1.77	3.94	2.59	15.74	39.69	53.40	---	52.32	75.39	62.63	62.98	88.49	28.84
FI	0.95	2.56	1.53	8.62	25.58	52.97	26.02	---	57.91	47.66	51.96	62.19	20.39
JA	0.19	0.48	0.30	1.79	6.33	21.19	7.16	11.07	---	23.65	16.33	33.14	4.38
KO	0.45	1.10	0.71	4.11	12.88	34.02	14.31	21.92	57.13	---	30.04	51.55	10.10
PK	0.45	1.22	0.72	4.28	15.21	34.65	14.82	24.62	41.08	31.10	---	51.02	10.48
TA	0.15	0.38	0.23	1.43	5.50	14.37	6.58	9.30	26.50	16.86	16.10	---	3.84
VI	2.30	6.00	3.97	20.11	38.07	71.85	40.81	57.99	65.16	62.53	63.04	73.04	---

Source: Summary File 1, U.S. Census of Population 2000 (U.S. Census Bureau 2001a)

Note: Group names are abbreviated as follows: Hisp. is an abbreviation for Hispanic, AI is an abbreviation for Asian Indians, CA is an abbreviation for Cambodians, CH is an abbreviation for Chinese, FI is an abbreviation for Filipinos, JA is an abbreviation for Japanese, KO is an abbreviation for Koreans, PK is an abbreviation for Pakistanis, TA is an abbreviation for Taiwanese, and VI is an abbreviation for Vietnamese.

In summary, I found that Asian groups combined are segregated from non-Asian groups at moderate levels for blacks (S = 35.6) and Hispanics (S = 27.2) and low levels for white (S = 19.2). In addition, I found that particular Asian groups show patterns similar to the patterns some for all Asian groups combined with segregation highest with blacks, lowest with whites, and in between with Hispanics.

Interestingly, I also found that Asian groups are sometimes highly segregated from each other. This is indicated by scores for the index of dissimilarity (D) and the variance ratio (V). But these scores are complicated to interpret due to their non-trivial upward bias when used with small groups. Scores for S are free of this problem and confirm that segregation between Asian groups is often greater than their segregation from non-Asian groups and sometimes exceed the level of segregation between whites and blacks, which is widely viewed as very high.

CHAPTER VII

SUMMARY AND CONCLUSIONS

There has been ongoing increase of Asian population in the U.S. and also in Houston area which warrants studies of residential segregation of detailed Asian populations. The results of my analyses show that residential segregation of both broad racial and ethnic groups and Asians are affected by education and income in Houston area. Furthermore, other factors like language, population size, and culture affect the patterns of residential segregation among detailed Asian groups. The separation index (S) measure registers these influences. Based on my analysis, I predict that the pattern of Asian residential segregation will still follow the previous patterns based on education and income. But other factors do have influence on residential segregation of both broad racial groups and detailed Asian groups.

However, it seems that residential segregation among whites and Asians will decrease more and residential segregation among Asians and blacks will increase. But residential segregation among Asians and Hispanics is not quite predictable because the populations of Hispanic are increasing dramatically. Therefore, there should be more research on Asian residential segregation to better assess the influences of important factors beyond education and income. In addition, I believe that there could be more detailed research on Asian residential segregation in other large metropolitan areas in the U.S.

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APPENDIX

Table A1. Summary of Mean Educational Attainment for Person Aged 25 and Above

	Weig. Mean	Weighted Number	Unweight. Mean	Standard Deviation	Number	Standard Error
Broad Racial and Ethnic Groups						
White (non-Hispanic)	3.40	1,536,376	3.33	1.63	70,735	0.00
Black	2.67	459,271	2.61	1.56	19,833	0.01
Asian	3.59	146,631	3.57	1.99	5,963	0.03
Hispanic	1.58	667,381	1.55	1.58	29,390	0.01
Detailed Asian Groups						
Asian Indians	4.20	32,777	4.21	1.89	1,318	0.05
Cambodian	1.64	1,515	1.51	1.34	69	0.16
Chinese	4.04	31,327	4.06	1.97	1,276	0.06
Filipino	4.18	14,693	4.15	1.50	606	0.06
Japanese	3.97	2,994	3.99	1.62	132	0.14
Korean	3.59	6,875	3.56	1.82	291	0.11
Pakistani	3.97	5,902	3.83	1.88	232	0.12
Taiwanese	4.34	2,750	4.28	1.90	107	0.18
Vietnamese	2.49	41,150	2.49	1.80	1,672	0.04
Other Detailed Asian Groups						
Thai	3.86	1,446	3.88	1.81	56	0.24
Sri Lankan	4.64	188	4.75	1.39	8	0.49
Malaysian	3.66	197	3.88	1.13	8	0.40
Laotian	1.92	807	1.97	1.40	31	0.25
Indonesian	3.76	161	3.33	1.86	6	0.76
Hmong	2.79	70	2.50	1.73	4	0.87
Bangladeshi	5.33	162	5.33	0.52	6	0.21
Other Asian	4.80	223	4.71	2.14	7	0.81
Other Asian, not specified	3.38	1,215	3.22	2.31	49	0.33
All Combination	3.52	2,179	3.45	2.21	85	0.24

Source: U.S. Census 2000 Public Use Micro Samples (U.S. Census Bureau 2003c)

Table A2. Summary of Mean Family Total Income for Person Aged 25 and Above

	Weighted Mean	Unweight. Mean	Standard Deviat.	Sample Count Number	Standard Error
Broad Racial and Ethnic Groups					
White (non-Hispanic)	$ 70,855	$ 70,233	$ 78,541	70,735	295.3
Black	$ 40,038	$ 39,114	$ 46,314	19,833	328.9
Asian	$ 66,190	$ 68,354	$ 67,030	5,963	868.0
Hispanic	$ 43,262	$ 43,105	$ 49,866	29,390	290.9
Detailed Asian Groups					
Asian Indians	$ 79,048	$ 82,952	$ 85,984	1,318	2,368.4
Cambodian	$ 67,076	$ 65,469	$ 59,838	69	7,203.6
Chinese	$ 65,770	$ 67,436	$ 68,350	1,276	1.913.4
Filipino	$ 75,903	$ 76,370	$59,223	606	2,405.8
Japanese	$ 70,423	$ 74,806	$ 77,180	132	6,717.7
Korean	$ 53,467	$ 56,839	$ 56,227	291	3,296.1
Pakistani	$ 62,400	$ 60,721	$ 56,658	232	3,719.8
Taiwanese	$ 70,668	$ 71,353	$ 52,782	107	5,102.6
Vietnamese	$ 55,789	$ 58,241	$ 52,997	1,672	1,296.1
Other Detailed Asian Groups					
Thai	$ 62,024	$ 62,788	$ 52,409	56	7,003.4
Sri Lankan	$ 76,486	$ 82,425	$ 57,411	8	20,297.9
Laotian	$ 49,520	$ 49,440	$ 24,948	31	4,480.8
Malaysian	$ 55,301	$ 54,055	$ 48,899	8	17,288.4
Bangladeshi	$ 100,039	$ 98,255	$88,280	6	36,040.2
Hmong	$ 96,940	$ 96,940	$ 0	4	$ 0
Indonesian	$ 52,140	$ 42,080	$ 46,964	6	19,173.0
Other Asian	$ 55,735	$ 54,086	$ 59,171	7	22,364.5
Other Asian, not specified	$ 48,709	$ 50,697	$ 53,882	49	7,697.4
All Combination	$ 65,465	$ 66,722	$ 58,228	85	6,315.7

Source: U.S. Census 2000 Public Use Micro Sample (U.S. Census Bureau 2003c)

Table A3. Summary of Mean Linguistic Isolation for Person Aged 25 and Above

	Weight. Mean	Unweight. Mean	Standard Deviat.	Sample Count Number	Standard Error
Broad Racial and Ethnic Groups					
White (non-Hispanic)	0.006	0.006	0.075	70,735	0.000
Black	0.007	0.006	0.077	19,833	0.001
Asian	0.273	0.271	0.444	5,963	0.001
Hispanic	0.288	0.284	0.451	29,390	0.003
Detailed Asian Groups					
Asian Indians	0.110	0.108	0.311	1,318	0.009
Cambodian	0.487	0.406	0.495	69	0.060
Chinese	0.328	0.330	0.470	1,276	0.013
Filipino	0.081	0.084	0.278	606	0.011
Japanese	0.314	0.318	0.468	132	0.041
Korean	0.313	0.299	0.459	291	0.027
Pakistani	0.109	0.116	0.321	232	0.021
Taiwanese	0.328	0.308	0.464	107	0.045
Vietnamese	0.435	0.426	0.495	1,672	0.012
Other Detailed Asian Groups					
Thai	0.322	0.339	0.478	56	0.064
Sri Lankan	0.000	0.000	0.000	8	0.000
Laotian	0.266	0.290	0.461	31	0.083
Malaysian	0.431	0.500	0.535	8	0.189
Hmong	0.000	0.000	0.000	4	0.000
Indonesian	0.106	0.167	0.408	6	0.167
Bangladeshi	0.080	0.167	0.408	6	0.167
Other Asian	0.000	0.000	0.000	7	0.000
Other Asian, not specified	0.215	0.204	0.407	49	0.058
All Combination	0.287	0.282	0.453	85	0.049

Source: U.S. Census 2000 Public Use Micro Sample (U.S. Census Bureau 2003c)

Table A4. Summary of Mean Speak English for Persons Age 25 and Above

	Weighted Mean	Unweigh. Mean	Standard Deviat.	Sample Count Number	Standard Error
Broad Racial and Ethnic Groups					
White (non-Hispanic)	0.994	0.994	0.075	70,735	0.000
Black	0.994	0.994	0.078	19,833	0.001
Asian	0.785	0.780	0.414	5,963	0.005
Hispanic	0.665	0.668	0.471	29,390	0.003
Detailed Asian Groups					
Asian Indians	0.908	0.915	0.279	1,318	0.008
Cambodian	0.561	0.565	0.499	69	0.060
Chinese	0.761	0.755	0.430	1,276	0.012
Filipino	0.961	0.955	0.206	606	0.008
Japanese	0.889	0.894	0.309	132	0.027
Korean	0.709	0.691	0.463	291	0.027
Pakistani	0.894	0.871	0.336	232	0.022
Taiwanese	0.732	0.729	0.447	107	0.043
Vietnamese	0.641	0.632	0.483	1,672	0.012
Other Detailed Asian Groups					
Thai	0.911	0.893	0.312	56	0.042
Sri Lankan	1.000	1.000	0.000	8	0.000
Laotian	0.659	0.677	0.475	31	0.085
Malaysian	0.751	0.625	0.518	8	0.183
Hmong	0.829	0.750	0.500	4	0.250
Indonesian	1.000	1.000	0.000	6	0.000
Bangladeshi	0.796	0.833	0.408	6	0.167
Other Asian	0.874	0.857	0.378	7	0.143
Other Asian, not specified	0.854	0.878	0.331	49	0.047
All Combination	0.753	0.741	0.441	85	0.048

Source: U.S. Census 2000 Public Use Micro Sample (U.S. Census Bureau 2003c)

Table A5. Summary of Proportion U.S. Citizen for Person Age 25 and Above

	Weight. Mean	Unwi eght. Mean	Standard Deviation	Sample Count Number	Standard Error
Broad Racial and Ethnic Groups					
White (non-Hispanic)	0.976	0.978	0.145	70,735	0.001
Black	0.968	0.972	0.165	19,833	0.001
Asian	0.578	0.588	0.492	5,963	0.006
Hispanic	0.559	0.567	0.496	29,390	0.003
Detailed Asian Groups					
Asian Indians	0.480	0.508	0.500	1,318	0.014
Cambodian	0.644	0.623	0.488	69	0.059
Chinese	0.551	0.556	0.497	1,276	0.014
Filipino	0.668	0.680	0.467	606	0.019
Japanese	0.442	0.424	0.496	132	0.043
Korean	0.590	0.577	0.495	291	0.029
Pakistani	0.426	0.414	0.494	232	0.032
Taiwanese	0.592	0.607	0.491	107	0.047
Vietnamese	0.677	0.684	0.465	1,672	0.011
Other Detailed Asian Groups					
Thai	0.376	0.393	0.493	56	0.066
Sri Lankan	0.346	0.375	0.518	8	0.183
Laotian	0.747	0.710	0.461	31	0.083
Malaysian	0.036	0.125	0.354	8	0.125
Hmong	0.529	0.500	0.577	4	0.289
Indonesian	0.273	0.333	0.516	6	0.211
Bangladeshi	0.704	0.667	0.516	6	0.211
Other Asian	0.327	0.429	0.535	7	0.202
Other Asian, not specified	0.723	0.755	0.434	49	0.062
All Combination	0.586	0.576	0.497	85	0.054

Source: U.S. Census 2000 Public Use Micro Sample (U.S. Census Bureau 2003c)

Table A6. Summary of Proportion Foreign Born for Persons Age 25 and Above

	Weighted Mean	Unweight. Mean	Standard Deviation	Sample Count Number	Standard Error
Broad Racial and Ethnic Groups					
White (non-Hispanic)	0.044	0.041	0.198	70,735	0.001
Black	0.059	0.053	0.224	19,833	0.002
Asian	0.945	0.945	0.227	5,963	0.003
Hispanic	0.621	0.614	0.487	29,390	0.003
Detailed Asian Groups					
Asian Indians	0.966	0.965	0.184	1,318	0.005
Cambodian	0.982	0.986	0.120	69	0.014
Chinese	0.925	0.924	0.265	1,276	0.007
Filipino	0.906	0.906	0.292	606	0.012
Japanese	0.674	0.705	0.458	132	0.040
Korean	0.951	0.952	0.214	291	0.013
Pakistani	0.998	0.996	0.066	232	0.004
Taiwanese	0.990	0.991	0.097	107	0.009
Vietnamese	0.972	0.976	0.153	1,672	0.004
Other Detailed Asian Groups					
Thai	0.957	0.946	0.227	56	0.030
Sri Lankan	0.931	0.875	0.354	8	0.125
Laotian	1.000	1.000	0.000	31	0.000
Malaysian	1.000	1.000	0.000	8	0.000
Hmong	1.000	1.000	0.000	4	0.000
Indonesian	1.000	1.000	0.000	6	0.000
Bangladeshi	1.000	1.000	0.000	6	0.000
Other Asian	0.874	0.857	0.378	7	0.143
Other Asian, not specified	0.686	0.694	0.466	49	0.067
All Combination	0.901	0.894	0.310	85	0.034

Source: U.S. Census 2000 Public Use Micro Sample (U.S. Census Bureau 2003c)

Table A7. Exposure Indices for Neighborhood Educational Attainment for Detailed Asian Groups and for Broad Racial and Ethnic Populations in Houston, Texas in 2000

	Exposure to Neighborhood Education		
	Number	Median	Mean
Broad Racial and Ethnic Groups			
White	2,239,839	2.8	2.8
Black	778,679	2.2	2.3
Asian	226,177	2.9	2.9
Hispanic	1,348,566	2.0	2.0
Detailed Asian Groups			
Asian Indians	51,959	3.1	3.0
Cambodian	2,648	2.4	2.4
Chinese	45,182	3.1	3.0
Filipino	22,494	2.9	2.9
Japanese	4,320	3.3	3.2
Korean	10,341	3.1	3.0
Pakistani	10,633	2.9	2.9
Taiwanese	3,355	3.5	3.3
Vietnamese	63,924	2.5	2.5
Other Detailed Asian Groups			
Indonesian	840	3.2	3.1
Hmong	5	2.3	2.6
Bangladeshi	777	2.9	2.8
Laotian	1,355	2.1	2.2
Malaysian	288	3.0	3.0
Sri Lankan	445	3.2	3.2
Thai	1,709	2.9	2.9
Other Asian	306	2.9	2.9
Other Asian, not specified	3,435	2.7	2.8

* See text for description of measurement of neighborhood education.

Source: Summary Files 1 and 3 from U.S. Census 2000 (U.S. Census Bureau 2001a and 2002b)

Table A8. Exposure Indices of Median Family Income for Detailed Asian Groups and for Broad Racial and Ethnic Populations in Houston, Texas in 2000

	Exposure to Neighborhood Median Family Income		
	Number	Median	Mean
Broad Racial and Ethnic Groups			
White	2,239,893	$ 61,689	$ 66,332
Black	778,684	$ 37,050	$ 40,678
Asian	226,177	$ 55,299	$ 62,250
Hispanic	1,348,588	$ 37,400	$ 42,384
Detailed Asian Groups			
Asian Indians	51,959	$ 62,365	$ 67,970
Cambodian	2,648	$ 48,710	$ 51,719
Chinese	45,182	$ 64,762	$ 68,062
Filipino	22,494	$ 55,299	$ 60,558
Japanese	4,320	$ 65,556	$ 72,671
Korean	10,341	$ 60,709	$ 68,201
Pakistani	10,633	$ 54,969	$ 60,306
Taiwanese	3,355	$ 79,738	$ 80,459
Vietnamese	63,924	$ 47,926	$ 52,360
Other Detailed Asian Groups			
Indonesian	840	$ 61,929	$ 66,985
Hmong	5	$ 27,313	$ 52,420
Bangladeshi	777	$ 51,550	$ 55,418
Laotian	1,355	$ 45,231	$ 46,959
Malaysian	288	$ 66,660	$ 71,285
Sri Lankan	445	$ 72,406	$ 71,925
Thai	1,709	$ 56,852	$ 62,415
Other Asian	306	$ 57,529	$ 61,714
Other Asian, not specified	3,435	$ 54,799	$ 59,230

Source: Summary Files 1 and 3 from U.S. Census 2000 (U.S. Census Bureau 2001a and 2002b)

Table A9. Exposure to Area Percentage White in Houston, Texas 2000

	Number	Median	Mean
Broad Racial and Ethnic Groups			
White	2,239,893	71.2	65.6
Black	778,684	15.5	23.7
Hispanic	1,348,588	26.0	32.9
Asian	226,177	45.3	45.3
Detailed Asian Groups			
Asian Indians	51,959	51.6	49.7
Cambodian	2,648	34.1	38.9
Chinese	45,182	52.1	48.7
Filipino	22,494	43.1	45.2
Japanese	4,320	69.2	62.7
Korean	10,341	58.1	56.7
Pakistani	10,633	42.7	44.2
Taiwanese	3,355	62.0	56.6
Vietnamese	63,924	29.7	36.0

Source: Summary File 1 from U.S. Census 2000 (U.S. Census Bureau 2001a)

Table A10. Exposure to Area Percentage Black in Houston, Texas 2000

	Number	Median	Mean
Broad Racial and Ethnic Groups			
White	2,239,893	4.4	8.2
Black	778,684	38.7	45.2
Hispanic	1,348,588	8.0	14.6
Asian	226,177	11.7	15.3
Detailed Asian Groups			
Asian Indians	51,959	9.6	14.4
Cambodian	2,648	14.1	19.7
Chinese	45,182	8.8	12.9
Filipino	22,494	13.5	17.9
Japanese	4,320	5.1	9.1
Korean	10,341	7.1	9.6
Pakistani	10,633	13.5	15.7
Taiwanese	3,355	5.5	10.1
Vietnamese	63,924	15.6	18.0

Source: Summary File 1 from U.S. Census 2000 (U.S. Census Bureau 2001a)

Table A11. Exposure to Area Percentage Hispanic in Houston, Texas 2000

	Number	Median	Mean
Broad Racial and Ethnic Groups			
White	2,239,893	14.2	19.8
Black	778,684	21.0	25.3
Hispanic	1,348,588	44.4	47.1
Asian	226,177	20.4	23.8
Detailed Asian Groups			
Asian Indians	51,959	16.3	19.8
Cambodian	2,648	29.7	31.1
Chinese	45,182	14.5	20.9
Filipino	22,494	20.1	22.6
Japanese	4,320	11.6	17.6
Korean	10,341	18.0	21.6
Pakistani	10,633	20.0	22.7
Taiwanese	3,355	9.4	15.6
Vietnamese	63,924	27.3	30.7

Source: Summary File 1 from U.S. Census 2000 (U.S. Census Bureau 2001a)

Table A12. Exposure to Area Percentage Asian in Houston, Texas 2000

	Number	Median	Mean
Broad Racial and Ethnic Groups			
White	2,239,893	2.8	4.6
Black	778,684	1.3	4.4
Hispanic	1,348,588	1.4	4.0
Asian	226,177	11.1	13.4
Detailed Asian Groups			
Asian Indians	51,959	11.1	13.8
Cambodian	2,648	7.5	8.4
Chinese	45,182	13.2	15.2
Filipino	22,494	9.8	12.1
Japanese	4,320	6.6	8.4
Korean	10,341	7.8	9.9
Pakistani	10,633	13.5	14.7
Taiwanese	3,355	13.2	15.5
Vietnamese	63,924	11.5	13.2

Source: Summary File 1 from U.S. Census 2000 (U.S. Census Bureau 2001a)

VITA

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