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Why are there so many Indian restaurants on Ludlow?

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Abstract

Ludlow Avenue, Cincinnati, Ohio: a business and entertainment district described as "bohemian" or "eclectic," caters not only to University of Cincinnati students, but also to the Greater Cincinnati population. Ludlow Avenue is also the location of a curious phenomenon; within a two block segment of this district, three Indian restaurants operate. Does this suggest a significant Asian Indian population in the vicinity?

Baseline research into the spatial relationship between Asian Indians and Indian restaurants in Cincinnati was conducted to give the field of geography a better understanding of ethnic immigrant population's spatial relationship to their representative cuisine.

Spatial autocorrelation and cluster analysis on Asian Indian populations and Indian restaurants were conducted for Hamilton, Warren, Butler and Clermont counties in Ohio to better understand the spatial relationship.

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Introduction

Ludlow Avenue, Cincinnati, Ohio: a business and entertainment district described as "bohemian" or "eclectic," caters not only to University of Cincinnati students, but also to the Greater Cincinnati population. Ludlow Avenue is also the location of a curious phenomenon; within a two block segment of this district, three Indian restaurants operate. Does this suggest a significant Asian Indian population in the vicinity?

A better understanding of Indian restaurants locations in the Greater Cincinnati area, relative to Asian Indian population through time, will give the field of geography a better understanding of the spatial cohesion and connectivity between ethnic cuisine and its distinct ethnic population. This thesis, then, is a baseline research endeavor that seeks to more fully understand the relationship that Indian restaurants have with Asian Indian populations, and also with the American consumer.

The spatial relationship of ethnic restaurants and their represented population is a neglected focus of academic research. A singular study on self-described ethnic restaurants in metropolitan areas of the United States and Canada in 1980, coupled with Philadelphia's self-described ethnic restaurant cuisine from 1920-1980, focused on the "geography of foodways" and "transnationalization of culture," and issues the provocative statement "there is usually at best only a weak link between geographic pattern of a given cuisine and that of the related immigrant stock" (Zelinski 1985; 51), providing the theoretical framework for this research. Zelinski's focus was national;

while this research will focus locally on one ethnicity and its representative cuisine,

Asian Indians and Indian cuisine.

Literature review

United States immigration policy, ethnic economy, restaurant location and Indian restaurant dynamics are the four main fields of literature reviewed for this thesis. All four strands of research aid in a better understanding of the complex interrelations of Asian Indians and the Indian restaurant location in Cincinnati.

United States Immigration Policy Affecting Asian Indians

Immigration policies of the United States have economic, political, ethnic, religious and cultural implications for American society. American society is affected by large influxes of people with distinct and unique cultures. As part of the assimilation process, certain characteristics of new immigrant populations are absorbed by American culture and the dynamics of United States society are altered. Immigration policies of the United States have affected the flows of people into American society since 1880. Understanding how the Asian Indian's migration to the United States has been controlled by legislation gives a better understanding of the spatial and temporal relationships between Asian Indians and Indian restaurants. This research aims to better understand the spatial and temporal relationship Asian Indian restaurateurs confront while fulfilling an ethnic restaurant niche in American culture.

The Immigration Act of 1965 was a monumental shift in United States immigration policy, providing equality between nations and having a tremendous effect on the influx of Asian Indian immigration to the United States. Prior to 1965, severe restrictions were placed on immigrants from India; the change in policy sparked a huge transition and a large increase in the number of Asian Indians entering the United States (Hing, Kanjanapan, Massey, Walker). Not only was the number of Asian Indians drastically increased, the type of immigrant was greatly influenced. Understanding United States immigration policy allows for a better understanding of the Asian Indian immigrants that settle in Cincinnati.

The United States has not had a consistent immigration philosophy, rather, "legislation has reflected the sentiment and mood of the country and the particular legislators in office" (Keeley, 1971, p.158). United States immigration policy has a racist past; policy barred specific nationalities and placed quotas on people, nationalities and hemispheres. Restrictive legislative acts have had a major influence on the ethnic makeup of the United States; those placed on Asian immigration are a main example ohf how the immigration policies of United States influence the American landscape (Gonzales, Hess, Mills). The Immigration Act of 1965 modified a legacy of racism and created a system that allowed certain types of Asian Indians to gain entry into the United States.

In 1965, the Immigration and Nationality Act (INS Act) abolished the national origin quota system, providing equity for people of all nations. The 1965 act "unleashed and unprecedented and unexpected flow of immigrants" from Asia (Massey, 1995, p.638).

Prior to the 1965 act, immigration to the United States was predominantly European; the 1965 law spurred a major shift in the ethnic makeup of immigrants to the United States. Because of the shift in immigration policy, 40% of all United States immigrants between 1976 and 1990 were from Asia (Kanjanapan, 1995). United States immigration policy has gone from drastically hampering Asian Indian immigration to spurring an influx of well-educated, professional, English-speaking Asian Indians with the policy's emphasis on English speaking and educational attainment.

The first national immigration law targeting a specific group of immigrants, the Chinese Exclusion Act, was passed in 1882. This act focused on the Chinese who were arriving to the United States for employment, many times the Chinese immigrants were employed as agricultural workers and railroad laborers. The 1882 act allowed Chinese to enter and leave the United States by issuing work visas and certificates of residency; however, they were not granted citizenship. Asian Indians had been arriving in small numbers to the United States since 1820. However, due to their sparse numbers and racist sentiment existing at the time, most Asians were treated as Chinese, all Asians fell under the colloquial umbrella Chinese regardless of national origin (Gonzales, 1986).

An overwhelming majority of the original Asian Indian immigrants in the 19th century were ethnic minority Sikhs from the Punjab region in India; they settled in northern California and predominantly worked in agriculture (Gonzales 1986, Hess1974, Millis 1911). California went a step further than national immigration policy, Asian Indians were "not allowed to become citizens; they were not allowed to purchase or lease

property; they were not allowed to send for their wives or future brides in India; they were not allowed to travel outside this country; their participation in the labor force was severely limited to certain occupational categories; they were not allowed to marry Anglo women" (Gonzales, 1986, p.46). The restrictive immigration and social legislation coupled with the Sikhs' distinct religious and cultural attributes marginalized them from mainstream American society. The inability to create a second generation that would serve to bridge the gap between Sikh and American society was drastically hampered. Sikhs would often marry Mexican American women, but their children would usually be given Christian names and be baptized as Catholics (Gonzales, 1986). The Sikh community was not able to establish itself successfully and fully assimilate into American culture as a result of Sikh social isolation and the racist United States immigration legislation of the 19th century and early 20th century.

The 1882 Immigration Act was just the first racist legislation that affected Asian Indian immigration to the United States. Hess, in his research of the first Asian Indian immigration to the United States, found that the two most important United States immigration policies affecting Asian Indian immigration were the Immigration Act of 1917 and the Supreme Court decision on the "Thind Case". The 1917 Act, also known as the Asiatic Barred Zone Act, created a region of Eastern Asia and Pacific Islands from which people could not immigrate. Asian Indians had fallen under the colloquial umbrella of "Chinese" before this time and treated socially as the same, the legislation now made it official policy to bar entry of almost all Asians including Asian Indians. The Thind Case ruled that Asian Indians were not "white persons"; "even more

disastrous was the provision that all Asian Indians naturalized prior to this decision had received their papers 'fraudulently' and therefore were not American Citizens after all" (Gonzales,1986, p.44). Asian Indians went from being legal citizens of the United States to people who had received their citizenship in error and were no longer considered legal citizens. The 1917 Act created a system where as no more than 110 persons from a "barred zone" country could immigrate to the United States per year. Asian Indian immigration was severely restricted; however, the 1965 Immigration Act would change United States immigration policy by creating a system with more equity for people of all nations applying for citizenship to the United States. Specifically, the 1965 Immigration Act :

...abolished the national origins quota system and replaced it with a new visa preference system. Family reunification was the main target, with secondary allowances for occupational skills and refugee status. More specifically the 1965 amendments assigned annual quotas of 120,000 persons for the western hemisphere regions and 170,000 persons for the eastern Hemisphere areas, or 290,000 from all countries (the ceiling was reduced to 270,000 in 1989.) Within this general quota system, there is no national origin quota other than the limitation of 20,000 annual visas for each country. (Kanjanapan, 1995, p.12).

The timing of the 1965 Immigration Act was significant. India had an educational infrastructure that was creating more educated persons than the Indian economy could absorb; the 1965 Immigration act opened new doors for educated Asian-Indians to seek new economic opportunities in America (Hing, 1993). Saran, in his book "The Asian Indian experience in the United States," surveyed Indian immigrants in the New York Area and drew comparisons with typical Asian Indians. His observations show the difference in immigrating classes of people to the United States and the typical Asian-Indian citizen:

While most Indian (73 percent) cannot read or write, almost all of these adults who came here had at least some formal college education. While four out of five people in India live in small village communities, only one out of 11 of those in the New York area survey indicated a village as the last place of permanent residence in India. While most Indians have never traveled more than a day's journey away from their homes, nearly one-fifth of our respondents had lived in at least one other country before coming to the United States, and many had visited or studied in the United States before deciding to become permanent residents. While most Indians work in agricultural occupations, most of the men in our survey who had worked in India had been employed in professional, technical, and managerial positions. While most Indians speak only one of the many languages native to the vast subcontinent, almost all that came to the United States spoke English as well, with most using English frequently for conversations at home now. (Saran, 1985, p. 140)

There was a large difference between the average Asian Indian and the typical United States immigrant from India. "With modifications in the US immigration Laws of 1965, an educated professional class of Asian Indians have monopolized the immigration flow of immigrants from India" (Gonzales, 1986, p.40). This professional class of new immigrants settles in the United States and creates new economic opportunities for themselves and their community. Hing states that Asian Indian "residential and economic enclaves can be found in various parts of New York and California and in Chicago, Newark, Washington, D.C., and Cincinnati" (Hing, 1993, p.104). The ethnic enclave is a special and rare case of the ethnic economy and will be explored in the next chapter.

Ethnic Economy

The ethnic economy is a subset of the national economy, whereas ethnic businesses are operated by ethnic minorities and predominantly employ ethnic laborers. The restaurant sector (*catering* in British literature) is the focal industry for this study of the ethnic economy. "Catering represents one of the classic 'niches' traditionally occupied by ethnic minority enterprise and is clearly an area where cultural identity is of the utmost operational importance, with caterers offering their own unique national-regional foods to the wider public" (Ram et al., 2000, p.498).

The length of time an ethnic population has been represented in Cincinnati is important; "ethnic enterprises depend heavily on the patronage of co-ethnics, at least in the early years of settlement" (Aldrich et al, 1985, p.997). Pioneering Asian Indian populations in Cincinnati were first represented by an initial Indian restaurant, Khybar. Khybar located its restaurant downtown, away from Indian population, but catering to lunchtime downtown patronage. Mayura, located on Ludlow in Clifton, was the second Indian restaurant open in Cincinnati and gives a better glimpse in to the historic center of Asian Indian community in Cincinnati. Cincinnati's Indian restaurants will be explored to better understand the historic and current spatial relationship to Asian Indian populations. "Neighborhoods with high concentration of immigrant populations are fruitful territory for immigrant business in general and especially those that cater for specialist ethnic tastes" (Kloosterman and Rath, 2001, p.197). Indian restaurant locations and restaurant clusters relative to Asian Indian populations is be the main focus of this study.

"The concept of protected consumer market has been used to refer to the special, culturally based tastes of ethnic minorities that can only be served by co-ethnic businesses" (Aldrich et al, 1985, p.996). The Indian restaurant is an obvious instance of ethnic minorities serving distinct and unique tastes of their co-ethnics.

[A]ccess to markets and their growth potential not only differ from city to city but neighbourhood to neighbourhood within cities. This is related to the fact that spatial patterns of distribution of the population over a city also impinge upon the intra-urban spatial structure of consumer markets. Concentrations of specific groups of immigrants may constitute 'natural' or even 'captive' markets for immigrant entrepreneurs offering their co-ethnics products that are not provided by indigenous suppliers (Kloosterman and Rath, 2001, p.197).

While the visible perception of Indian restaurant clustering in certain parts of town, the Ludlow Avenue corridor, for instance, may hint at large populations of Asian Indians within close spatial proximity, and imply an important dynamic of an ethnic enclave economy in Cincinnati.

Hing (1993) states that there are residential and economic enclaves of Asian Indians in Cincinnati. While this sounds particularly promising for my research, in the context of geographic literature on ethnic enclave economies, there is no specific mention of an Asian Indian enclave in the United States or any specific ethnic enclave in Cincinnati. It is highly unlikely that an ethnic enclave of Asian Indians exists in Cincinnati on the level of traditional and widely accepted instances of United States ethnic enclaves like Miami's Cuban and Los Angeles' Chinese enclaves. This baseline study of the clustering of Asian Indian residential settlement patterns and Indian restaurant location geographies will

provide a first step towards a better understanding of Cincinnati's Asian Indians and its clustering.

Indian Restaurants

The dynamics of Indian restaurant patronage is not solely dependant on Asian Indian populations. Asian Indians' role as patrons for Indian restaurants is more of a 'gatekeeper' than the primary patronage of Indian restaurants (Josiam and Monteiro, 2004). Indian patrons provide an important stamp of authenticity as a gatekeeper for Indian restaurants; however, the vast majority of patrons for Indian restaurants are white (Josiam and Monteiro, 2004).

Not only are Indian restaurant patrons predominantly white, Josiam and Monteiro found that white patrons of Indian restaurants are "more educated and more affluent than the average population" (Josiam and Monteiro, 2004, p.21). Although patrons of Indian restaurants may not be predominately South Asian the ownership, management and labor force is predominately Asian Indian. The ethnicity of employees at Indian restaurants is important not only as suitable employees with prior knowledge and understanding of the cuisine but their presence provides authenticity to the social relationship of the restaurant with the general population (Ram et al., 2000). However the dependence on and access to the white consumer is not the overriding location strategy. Beside the role as a gatekeeper, the Asian Indian laborer plays an important role in the success of Indian restaurants. Immigrant entrepreneurs may be unable to maintain a link to labor supply when their ethnic specialty business is located in neighborhoods distanced from ethnic populations (Kloosterman and Rath, 2001).

The spatial relationship of Asian Indian populations and Indian restaurants gives a better understanding of how Asian Indian populations have grown and settled in Cincinnati in conjunction with the ability of Indian restaurants to expand restaurant number and locations and still maintain the necessary linkages with co-ethnic labor and Asian Indian patron. Spatial connectivity to Asian Indian populations for labor and patronage is important to the success of a restaurant (Poros, 2001). The role creating ideal culinary and aesthetic atmosphere for the American consumer in Indian restaurants will be explored later in the study.

Hospitality and Culinary Arts literature explore the perceptions of Indian restaurant patrons; their analysis creates a better understanding of the demographic and social atmosphere Indian restaurants have for the American consumer and suggests best operational practices for the Indian restaurateur. Josiam and Monteiro (2004) show that there are trends in American cuisine towards: new and exotic foods, restaurants with vegetarian options, and restaurants with an option for spiciness. Indian cuisine fulfills all three criteria Josiam and Monteiro put forth and may be major contributing factors to the long-term success and rapid expansion of Indian restaurants in Cincinnati. However, this is beyond the scope of the research. Josiam and Monteiro (2004) also find that another distinction needs to be established with the dual role the cuisine takes in the marketplace. Indian cuisine is culturally significant and symbolic of traditional lifestyles and holiday/celebration in India. The cuisine is new and exotic to American consumers and described seen more as "culinary tourism."

Helen White and Katerini Kokotsaki surveyed Indian restaurant patrons by ethnicity in the UK to assess their preferences when eating Indian cuisine. Patrons were classified into two groups, English or Indians. Indians ate at Indian restaurants for the following reasons: "enjoyment", "good life", "health", "religion", and "culture". While English answered the survey with the following answers: "social life", "health", "adventure", "enjoyment", "savings" (White, 2004). Distinct differences between Indians and English become apparent from White's research. Indians viewed the food as a part of their culture and religion while the English viewed the food as and adventurous and economical meal.

Similarly, Josiam and Monteiro, in a 2004 survey, assessed the importance of influential factors for two ethnic categories of patrons, South Asians and other ethnicity. The survey found that "quality of food", "taste of food" and "hygiene and cleanliness" were the most influential factors in Indian restaurant patronage for both ethnic categories of patrons. However,

quality of food and taste of food were the only two significant factors on which respondents of other ethnic origin had higher expectations than those of south Asian origin. South Asians had significantly higher expectations than those of other ethnic origin on the following factors: hygiene and cleanliness; cleanliness of restrooms; employee friendliness; value for money; efficient service; spicy food; atmosphere; price; vegetarian choices; availability of new items; and cultural familiarity (Josiam and Monteiro, 2004, p.22).

While the South Asians are not the predominant ethnicity of the clientele, it is apparent they have higher standards than non-South Asians in their choices to dine at Indian restaurants. This higher standard shows the importance of satisfying the South Asian clientele because of their role as "gatekeepers". The gatekeeper's opinion and attitudes toward specific Indian restaurants is crucial to the success of the Indian restaurant because the gatekeeper often recommends specific restaurants to co-ethnics and white consumers (Josiam and Monteiro, 2004).

Indians have a historic and cultural attachment to Indian cuisine while the American consumer is developing a new relationship to Indian cuisine. This difference has to be navigated not only on the menu but within the location of restaurants in the market. Labor connectivity between Asian-Indians and Indian restaurants has already been discussed, however the neighborhood appeal and access to white patrons has yet to be discussed.

Restaurant Location

It has long been said that the three most important things in the restaurant business are location, location and location. Pillsbury argues that "the restaurant industry is a product of the complex interplay of traditional accessibility/threshold population constraints, a variety of socioeconomic, environmental, and cultural considerations; and the consumer decision-to-dine process" (Pillsbury, 1987, p.326). Pillsbury argues that subdividing restaurant types into specific categories, Indian for instance, are a simplistic approach to understanding location strategies, however, the baseline understanding of Indian restaurants makes it not only necessary, but important to understand. It can be argued that lumping all ethnic restaurants in the same category and assuming that Mexican, Japanese, Indian, Greek, and all other ethnic minority restaurants is a gross overgeneralization and easily perhaps even a more simplistic strategy than dividing into individual categories. It is a mistake to assume that the various ethnicities and their culturally represented food will operate in the United States market with the same spatial characteristics, especially when temporal data is being examined. With such data, some important patterns emerge that give a better understanding of both Indian restaurants and Asian Indian settlement patterns.

Ethnic residential settlement and ethnic business location can not be viewed with the same mindset as pre-1965 European migration. "Unlike the neatly patched pattern that presumably prevailed in the inner city before, today's locational pattern of ethnic enterprises is more complex and interwoven" than in earlier decades (Zhou, p. 3, 1998).

The old pattern of new immigrants migrating to urban centers and dense ethnic neighborhoods is not necessarily in operation today and therefore their businesses and businesses catering to their tastes will locate differently. Zhou (1998) further states that the severe racial segregation of Asians has dwindled and Asians now represent one of the most suburbanized minorities in the nation. The United States decennial Census data from 1980, 1990 and 2000 show clusterings of Asian Indians in two areas: Clifton and the northeastern Hamilton County suburbs (along with smaller tracts bordering the cluster in adjoining counties). Light (1994) states that finding spatially clustered ethnic enclaves in post 1965 immigrants is an infrequently occurring spatial phenomenon.

Indian restaurants fulfill a niche. Zhou states that "the spatial organization of ethnic business needs to be understood as the outcome of interaction between cultural and industrial identities of enterprises" (Zhou, p.2, 1998). The industrial identity deals with factors such as location, since the Indian restaurant operates as a subset of the restaurant industry. The cultural identity would deal with the mental, emotional, and historic understanding of South Asians and other Americans in the American consumer context. Zhou finds that Chinese firms that cater to both ethnic and mainstream clientele in Los Angeles locate themselves according to their industry (Zhou,1998). It is logical to conclude that Indian restaurants will locate with regard to their industry and cultural niches.

Methodology

The research methodology is designed to better understand spatial distribution of Asian India populations and Indian restaurant locations in Cincinnati from 1980 until 2005. United States Census data from 1980, 1990, and 2000 were used to establish the location of Asian Indian populations by census tract in Hamilton, Clermont, Warren and Butler Counties (referred to as Cincinnati for the rest of the study). Cincinnati Bell Donnelly Yellow Pages phonebooks were used to establish the existence and adresess of Indian restaurants for 1980, 1985, 1990, 1995, 2000 and 2005; these addresses were then geocoded to place them spatially in the study area. Moran's I and Ord-Getis statistical methods were used to assess the levels of spatial autocorrelation (Moran's I) and clustering (Ord-Getis) of Asian Indian populations by census tract. A ninety percent level or significance or an alpha of 0.1 is used to assess the minimum level of significance for this study. The spatial and tabular data were input into ArcMap 9.1, a GIS software for mapping and analyzing data.

The hypotheses are as follows:

 H_1 = Asian Indian populations show no significant spatial pattern in Cincinnati.

 H_2 = Indian restaurants show no significant spatial pattern in Cincinnati.

H₁ = Asian Indian populations show no significant spatial pattern in Cincinnati

Rationale: The 1965 Immigration Act creates a scenario where Asian Indians enter the United States as highly educated professionals with relatively proficient English speaking abilities. The attributes of this highly educated immigrant class will aid in their ease of assimilation and their lack of dependence on co-ethnics for housing and employment.

Statistic to test H₁: Residential settlement patterns in Cincinnati of Asian Indians by census tract will be assessed in 1980, 1990, and 2000, using Moran's I and Ord-Getis as a measure of potential spatial distribution and clustering.

Expected result: Asian Indian population settlement will disperse as time passes.

H₂ = Indian restaurants show no significant spatial pattern in Cincinnati.

Rationale: Restaurant location "is largely controlled by three locational criteria: accessibility, cluster dynamics, and consumer goals" (Pillsbury, 1987, p329). This relationship between consumer and provider will focus on the location decision of Indian restaurants, with the presumption that the number of Indian restaurants increases through time from 1980 to 2005, as does the clustering of those restrauants.

Statistic to test H₂: Nearest neighbor analysis was performed to better understand the spatial pattern of the restaurants in Cincinnati.

Expected result: Indian restaurants will agglomerate in historically successful neighborhoods; newer locations will locate with more emphasis on accessibility and travel patterns of a potential client base.

Results

 H_1 = Asian Indian populations show no significant spatial pattern in Cincinnati Ohio. H_2 = Indian restaurants show no significant spatial pattern in Cincinnati Ohio.

 H_1 = False, both Moran's I and Ord-Getis measures of spatial autocorrelation are found to be statistically significant

 H_2 = False, Nearest Neighbor analysis is found to be statistically significant.

 H_1 = Asian Indian populations show no significant spatial pattern in Cincinnati. Both Moran's I global measure of spatial autocorrelation (*Table 1*), and Ord-Getis General G measurement of clustering (*Table 2*) find significant results. The Moran's I measure uses a binary connectivity matrix, utilizing the queen's case weighted analysis method, which defines connectivity of census tract by shared borders, shared vertices, or both, irrespective of length of border. Therefore, a polygon's measure of spatial autocorrelation is based on each immediately surrounding polygon. Every bordering polygon has equivalent influence regardless of the length of shared border.

Moran's I measures spatial autocorrelation, with a range of possible values extending from-1 to 1; however a value of 0 does not necessarily imply a lack of spatial autocorrelation. The Moran's I finds 1980, 1990, and 2000 Asian Indian populations are significantly spatially autocorrelated at the alpha level of 0.01, with corresponding zscores(4.2[1980]; 5.6 [1990]; 11.1[2000]) increasing through time, implying that spatial autocorrelation is getting stronger, suggesting that the dependency of Asian Indian populations in census tracts are influenced by the existing Asian Indian populations in neighboring census tracts.

The Ord-Getis General G-statistic is a measure of spatial clustering, and it uses a distance variable to describe contiguity instead of a binary connectivity matrix, thus allowing a polygon to be assessed for clustering of a like phenomena based on the polygons within a specified distance of the polygon. As with a measure of spatial autocorrelation, the analysis does find significant clustering in 1980, 1990, and 2000, and it increases through time, with z-scores increasing from 1.1 (1980) to 1.8 (1990) to 1.9 (2000). This shows that the values increase their distance from the mean in a positive manner, thus implying that the clustering of high values (Asian Indian population per census tract) is increasing. The significance level is alpha = 0.1 in 1980 and 1990; the significance level alpha = 0.05 occurs in 2000. This shows that the clustering is less likely to be due to random chance.

Table 1

	Moran's I index	Z-score	significance level	cluster analysis
2000	0.05	11.1	0.01	There is a less than 1% likelihood that this clustered pattern could be the result of random chance
1990	0.02	5.6	0.01	There is a less than 1% likelihood that this clustered pattern could be the result of random chance
1980	0.02	4.2	0.01	There is a less than 1% likelihood that this clustered pattern could be the result of

Moran's I

Table 2

Ord-Getis

2000	2000	2000	2000	2000
1990	1990	1990	1990	1990
1980	1980	1980	1980	1980

 H_2 = Indian restaurants show no significant spatial pattern in Cincinnati.

Nearest neighbor analysis divides the actual distance observed amongst nearest neighbor (points) by an expected distance between points, if the pattern of points were randomly placed in the study area.Referring to the z-scores as the most favorable means of assessing the spatial patterns of Indian restaurants, we find that they increase negatively from 1990 until 2005, suggesting that the distance observed among an Indian restaurant to the next-closest Indian Restaurant to it is getting further from the expected distance calculated if the restaurants had been placed randomly in the study area. A significance level of alpha=0.01 was used for all year (Table 3). However, the number of restaurants

involved must be considered in the interpretation of these results. The year 1980 only had one Indian restaurant, it is impossible to perform neareast neighbor analysis. However, the year 1990 has a lower z-score than both 1985 and 1995, but the results are driven by the consistant existence of only two Indian restaurants in Cincinnati in 1985 and 1990. Mayura in Clifton was open in both 1985 and 1990; however, in 1985, Khybar was open in downtown Cincinnati, but it closed before 1990, and Tandoor opened in Montgomery opened between these years. Therefore, the distance between nearest neighbors in 1985 and 1990 changed drastically from a measure of Clifton to downtown to a measure of Clifton to Montgomery.

Nearest Neighbor

	Obs dist/Exp Dist	Z Score	Significance Level	Cluster Analysis
				There is a less than 1% likelihood that this clustered pattern could be the result of
2005	0.02	-6.8	0.01	random chance
				There is a less than 1% likelihood that this clustered pattern could be the result of
2000	0.17	-4.8	0.01	random chance
		_		There is a less than 1% likelihood that this clustered pattern could be the result of
1995	0.22	-3	0.01	random chance
1990	0.1	-1.3	0.01	While somewhat dispersed, the pattern may be due to random chance
1985	0.54	-2.5	0.1	There is a less than 5% likelihood that the clustering of high values is a result of random chance
1980	n/a	n/a	n/a	n/a

Analysis

Zelinski tabulated thousands of people in MSA (Metropolitan Statistical Area) per cuisines (restaurants). He took the total population and quantified the number of selfdescribed ethnic restaurants per thousand people. This is perhaps the best way to get a numeric understanding of the population and ethnic restaurant relationship on a national scale and fully include all cuisines. This research focuses on Indian restaurants and Asian Indian populations in Cincinnati and it was more representative to find the number of Asian Indians per restaurant (Asian Indian population/ number of Indian restaurants). This ratio was figured for 1980, 1985, 1990, 1995, 2000 and 2005. United States Decennial Census data from 1980 and 1990 was used to find 1985 statistic. The 1980 population was subtracted from 1990 data; the different was split in half and used to approximate the 1985 population. United States Decennial Census data from 1990 and 2000 was used to find 1995 statistic. The 1990 population was subtracted from 2000 data; the different was split in half and used to approximate the 1995 population. The 2005 data was approximated based on Us Census Community Survey findings; Ohio has a 20% increase in Asian Indian populations. Therefore the 2000 population count was multiplied by 1.2 to approximate 2005 Asian Indian population. The 1985, 1995, and 2005 findings are notably not as accurate as desired, but due to the lack of Asian Indian population statistics available for the middle of the decade, it is as accurate as could be The findings are in the below chart: created.

Table 4

Asian Indian population / Number of Indian restaurants

Year	Asian Indian population	Number of restaurants	Asian Indians per restaurant	
2005	9540**	20	477	
2000	7950	9	883	
1995	5679*	4	1420	
1990	3407	2	1704	
1985	2668*	2	1333	
1980	1928	1	1928	
 * estimate, mid point between decennial censuses ** estimate, based on US Census Community Survey of Asian Indians, Ohio had 20% increase in population 				

1980

The first Indian restaurant opened downtown Cincinnati in 1980. Khybar India located in the CBD (Central Business District) at 630 Race Street. The restaurant location strategy was to position itself to cater to the lunch time business clientele of the CBD. As illustrated below (see maps), the Asian Indian population does not predominately live downtown. Khybar India located itself to cater to people that work downtown. The restaurant was included in the 1985 and not in the 1990 Cincinnati Yellow pages, implying the restaurant closed.

The dot density map (Map 1) below shows the same population data as the chloropleth map (Map 3). The restaurant has been placed on the maps (red dot) to give a visual representation of the spatial relationships of the Asian Indian population by census tract and Indian restaurant location (Map 2, Map 4). The census tract with the largest Asian Indian population is in Clifton and roughly encompasses Burnett Woods and the surrounding streets. There are 120 Asian Indians that live in the census tract, whereas there is only one Asian Indian that lives in the tract with the lone Indian restaurant in the city.

Ord-Getis cluster analysis on Asian Indian population was performed on 1980 US Census tract data. The results appear below (Map 5), there appears to be a small cluster in Clifton and some clustering in the north, east, west and northeast of downtown Cincinnati; however, no distinct pattern emerges. Ord-Getis cluster analysis gives a better understanding of where the strongest clusters of Asian Indian populations reside. Moran's I measure of Spatial aurtocorrelation gives an understanding of the likelihood of a census tract with Asian Indian population to be located near other census tracts with Asian Indian population. The Ord-Getis spatial analysis takes cluster analysis a step further creating a global indicator of clustering and assesses the magnitude (represented by the G Statistic) of the clusters of census tracts with large Asian Indian populations. The G statistics for all the census tracts were split into five groups using Jenks natural breaks.


















In 1985, Mayura opened in Clifton on Jefferson. This changed the ratio of Asian Indian population per restaurant from 1 restaurant per 1928 Asian Indians to 1 restaurant per 1333 Asian Indians. It needs to be noted that the population for 1985 is just a midpoint between 1980 and 1990 data. The dot density and choropleth maps are using 1980 census data, it was impossible to use the rough estimate of 1985 population to intelligently populate the study area. It is also important to note that the restaurant is located in the census tract that contains the largest Asian Indian population in the city. The Nearest Neighbor analysis can be utilized for the first time because there is more than one restaurant in the study area.









The 1990 census shows a 77% increase in Asian Indian population from 1928 Asian Indians in1980 to 3407 Asian Indians in 1990. The population is growing in Northeastern Hamilton County and in Clifton north of the University of Cincinnati. It is important to note that Clifton is an urban cluster and the northeastern cluster is suburban and outside the city of Cincinnati in Hamilton County. Below are maps of Percent Asian Indian per census tract and a dot map of 1990 Asian Indian population. The maps below give a visual representation of the 1990 Asian Indian residential spatial population pattern. It is noteworthy to mention that the 1990 United States Decennial Census presents data that indicates dual clusters of Asian Indian populations; one urban cluster centered in Clifton and suburban cluster becoming apparent in northeastern Hamilton County.

There are still only two Indian restaurants in 1990; the downtown location is no longer open and Tandoor (8702 Market Place Lane) in Montgomery, has opened in northwestern Hamilton County. With the growing population of Asian Indian in northeastern Hamilton County, Tandoor has opened and located with close proximity to the strongest suburban Asian Indian population growth. Mayura is still open on Jefferson in Clifton and serves the university and hospital areas.

Ord-Getis cluster analysis was performed. There was one outlier's affect that needed to be eliminated from skewing the categories. The census tract was not eliminated,

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however, six categories of natural breaks were found and the parameters for the two lowest categories were merged to have the outlier still represented and in the lowest category, but not skewing the uniformity of 5 color/5 categories between the 1980, 1990 and 2000 Ord-Getis analysis mapping.

Ord-Getis cluster analysis shows the Clifton Cluster growing and an increase in clustering in the northeastern suburbs outside the city of Cincinnati city Limits.













Table 11



Table 12



Cincinnati had four Indian restaurants open in 1995. There is a spatial pattern of a Clifton Cluster and a lone suburban location, both of which locate near the two largest clusters of Indian population in the Cincinnati. It is necessary to note the difference in the two clusters. Clifton is a relatively dense urban area and is in close proximity to the University of Cincinnati. The 1995 Indian restaurant locations were mapped and coupled with the 1990 US Census data of Asian Indian population by census tract. Indian restaurants locations in 1995 were plotted with a dot density (Map 13) and choropleth map (Map 14). There are four Indian restaurants in 1995 . Tandoor and Mayura are still open and Ambar (350 Ludlow) and Vindu (313 Calhoun) have opened in Clifton. Ambar is located on the north side of the University of Cincinnati like Mayura. Both restaurants are located on Ludlow Avenue however; Mayura's location is closer to Cincinnati hospitals. Ambar's location is in the core of the Ludlow Business District. Vindu located on the southern edge of University of Cincinnati on Calhoun.

It should be acknowledged that the Asian Indian population in the census tracts around the University of Cincinnati probably greatly under estimates the number of Asian Indians in the study area. There are Asian Indians entering and leaving University of Cincinnati every quarter and the likelihood that they live near campus and are not represented in the census data is highly likely. The enrollment of Asian Indians at University of Cincinnati logically will have increased from 1980 to 2000, therefore, the likelihood for Asian Indians to live near campus and to be underestimated in census data should grow as the decades increase.

Table 13







In 1990 the Asian Indian population increased 130% from 3407 Asian Indians to 7950 Asian Indians in 2000. The population is growing in Northeastern Hamilton County, outside the city limits of Cincinnati, in the Clifton area, in southeastern Butler County, southwestern Warren County and in the Anderson area along I-275 in Clermont County. It is important to note that Clifton is an urban cluster and the rest are suburban locations. The neighborhoods tend to be in areas of the city known for good school districts and high end neighborhoods. Below are maps of Percent Asian Indian per census tract (Map 16) and a dot map of 2000 Asian Indian population (Map 15). The maps below give a visual representation of the 2000 Asian Indian residential spatial population pattern.

The year 2000 has an increase in Indian restaurants from 4 (1985) to 9 (1990). Vindu moves from 313 Calhoun to 204 McMillan St. Akash opens up on 6th street downtown, potentially motivated to serve lunchtime clientele from the CBD. Amol opens at 354 Ludlow next door to Ambar. Three new suburban locations open: Taj Mahal at 11778 Springfield Pike, Anand at 10890 Reading Road and Sitar at 4270 Hunt Road. Spatially, the cluster in Clifton grows in number of restaurants and the suburban locations are also growing in highest density Asian Indian areas. While not being located in the densest Asian Indian tracts, the locations are on major transportation arteries that would be frequented by people living in the most densely populated tracts. It is also interesting to note that all Indian restaurants are still inside the I-275 loop around the city. Map 17 and Map 18 have the 2000 Indian restaurants located on them.

Ord-Getis cluster analysis was performed on 2000 US Census Asian Indian population by census tract in the study area. The Clifton Cluster remains, however the suburban cluster to the northeast of downtown appears to be getting bigger. The cluster's growth is more focused, or is filling in, to the north where as 1990 data was cluster more in a northeasterly direction. Map 19 shows the Ord-Getis Cluster analysis.

Map 15







Map 17











The years from 2001-2005 had the largest number of new Indian restaurants. Eleven Indian restaurants were added to the nine present in 2000. Krishna opened at 313 Calhoun in Vindu's original location. Apna opened at 341 Ludlow and Indian palace opened at 944 Ludlow. All three restaurants, Apna, Krishna and India Palace added to the Clifton cluster, but they function spatially in different ways. Apna agglomerates with Amol and Ambar in the core of the Ludlow entertainment district. India palace located across from Cincinnati State and with closest proximity and at the end of the bridge connecting to the Northside neighborhood. Krishna locates on the south side of University of Cincinnati and in the former Vindu location; serving the other side of University of Cincinnati campus. It is also notable that Krishna is a small restaurant and caters more towards a take-away dining clientele. India Chat was found in the phonebook and implies that it is an Indian restaurant; its street address is 2607 Vine. The restaurant does not exist in 2007; the phone number is not operable and I have not been able to identify anyone that ate at the restaurant. It was left in the study, but not much was ever known about it by the researcher.

Reading Road had two new Indian restaurants: Brijmoham Indian Sweets (11277 Reading Road) and Udipi (7633 Reading Road). While on the same road, the neighborhoods are drastically different. Upidi is a southern Indian, all-vegetarian restaurant located on a major road in a neighborhood that is poorer and more diverse than the average Cincinnati area. There are also only six Asian Indians living in the census tract in 2000. Brijmoham is located with good access to northern suburbs and larger Asian Indian population.

Brijmoham is located near suburban Asian Indian populations and also along a major transportation corridor and with close proximity and access to the Interstate. Hi Bombay (4752 Fields Ertel Rd), Royal Taj (7711 Beechmont Rd), and Royal India (2198 E. Sharon Rd) all locate in suburbs on major roadways with easy access to interstates and near suburban Asian Indian populations, but not necessarily in tracts containing large amounts of Asian Indians. Hi Bombay is the first and only Indian restaurant to locate outside of I-275; however it is just on the outside of I-275 and functions with the same connectivity as being inside.

Finally, Baba India (3170 Madison) and Hyde Park India (3880 Paxton) locate in between the suburban and urban clusters of Asian Indian population near the Cumin location. It is also worth mentioning that the restaurants are in or near neighborhoods that would take on a completely different aesthetic than the restaurant locations mentioned in the prior paragraph (Brijmoham, Hi Bombay, Royal Taj, and Royal India). Map 20 and Map 21 show the 2005 Indian Restaurant locations relative to 2000 US Census data on Asian Indian population by census tract.





Map 21



Conclusion

There is a spatial clustering of both Asian Indian populations and Indian restaurants in Cincinnati. Zelinski was inaccurate with his conclusion that there is no relationship between ethnic cuisine and its representative population. The Indian restaurants do take on an interesting relationship with Asian Indian populations, a relationship that needs to be understood in more depth. Indian restaurant location seemingly takes on an evolving location strategy from locating near large ethnic populations to locating along major transportation arteries and potentially agglomerating with other ethnic restaurants. As the American consumer becomes more aware and knowledgeable of Indian cuisine and as the Asian Indian population grows in Cincinnati; Indian restaurants will increase in number and location strategy will slightly evolve to gain access to new people and venture into new markets around the city.

The research may be applicable to post 1965 immigrants and their representative cuisine's restaurant locations. It may only be relevant to ethnicities that benefited the most from the 1965 Immigration Act's policy changes; thus allowing some nationalities, mostly of Asia, a much larger number of immigrants to the United States than they had ever had before. The research also allows for the first step of a model of ethnic population spatial relationship to ethnic restaurant location to be developed. It is also possible there is a threshold of ethnic population necessary to support ethnic cuisine, that this research may help give a glimpse.

The next stage of research could go in three directions. One could look further into Indian restaurants or the attributes of the Asian Indian immigrants. A better understanding of the entrepreneurs might gain insight into the interconnectedness of restaurants, the location strategies and logic behind the opening of Indian restaurants. Or research could leave the realm of Asian Indians and look into other immigrant groups affected by the 1965 Immigration Act. Thai and Japanese might be the best ethnicities to study. Or a researcher could study the historic spatial relationships of Mexican restaurants and Mexican populations. Mexican food is more widely available to the American consumer and the restaurants have been around longer in Cincinnati. Studying Mexican spatial relationships may give insight into the future relationships of Indian restaurants and populations.

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Appendix

Table 5

Indian Restaurant List

RESTAURANT	ADDRESS	1980	1985	1990	1995	2000	2005
Akash India Restaurant	24 sixth Street					Х	Х
Ambar Indian Restaurant	350 Ludlow Ave				Х	Х	Х
Amol Indian Restaurant	354 Ludlow Ave					Х	Х
Anand India Restaurant	10890 Reading Rd					Х	Х
Apna Indian Restaurant	341 Ludlow Ave						Х
Baba India Restauran	3120 Madison Road						Х
Brijmoham Indian							х
Sweets and Restaurant	11277 Reading Rd						~
Cumin Modern Indian	3514 Erie Ave						X
Hi Bombay	4752 Fields Ertel Rd						Х
Hyde Park India	2880 Deviter Ave						Х
Restaurant	2607 Vine St						v
							× v
Inuian Palace		v	v				^
	212 Collegue St	^	^				v
Mayura Indian	STS Callour St						^
Restaurant	3201 Jefferson Ave		Х	Х	Х	Х	Х
Royal India	2198 F Sharon Rd						Х
Royal Taj Indian							
Restaurant	7711 Beechmont Ave						X
Sitar	4270 Hunt Road					Х	Х
Taj Mahal Indian Cuisine	11778 Springfield					Х	Х
Tandoor Indian	8702 Market place Ln			Х	Х	Х	Х
Udipi Cafe	7633 Reading Road						Х
Vindu	204 W McMilan					Х	
Vindu	313 Calhoun St				Х		

Table 6

2000 US Census tract data (Butler, Clermont	, Hamilton,	Warren)
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STATE	COUNTY	TRACT	ASIAN INDIAN POPULATION
39	017	12800	2
39	017	1100	7
39	017	900	3
39	017	400	1
39	017	11112	59
39	017	11113	388
39	017	11108	178
39	017	11110	30
39	017	13200	4
39	017	13300	4
39	017	13400	0
39	017	10906	97
39	017	10904	7
39	017	100	2
39	017	10201	24
39	017	10102	24
39	017	10101	38
39	017	10104	42
39	017	10103	45
39	017	12300	0
39	017	12700	0
39	017	12600	0
39	017	13100	1
39	017	12900	0
39	017	13900	0
39	017	13500	0
39	017	600	1
39	017	500	2
39	017	11001	26
39	017	1002	1
39	017	1200	7
39	017	1300	4
39	017	1001	5
39	017	11109	46
39	017	10903	48
39	017	11200	38
39	017	12500	19
39	017	14100	4
39	017	701	1
39	017	11101	102
39	017	200	6
39	017	10700	3
39	017	11801	2
39	017	11300	4
39	017	13000	0

39	017	14000	1
39	017	11802	0
39	017	11900	0
39	017	10500	0
39	017	702	4
39	017	800	1
39	017	12100	0
39	017	12000	0
39	017	12400	2
39	017	10600	0
39	017	11106	52
39	017	11107	116
39	017	10909	128
39	017	10203	2
39	017	11111	151
39	017	10908	97
39	017	10907	4
39	017	11104	136
39	017	10800	8
39	017	300	0
39	017	10901	6
39	017	10202	0
39	017	10902	27
39	017	10300	0
39	017	12200	5
39	017	13600	3
39	017	11002	14
39	017	1400	0
39	025	40204	3
39	025	40702	6
39	025	40701	26
39	025	40600	8
39	025	41303	10
39	025	41102	17
39	025	41103	4
39	025	41502	5
39	025	41800	4
39	025	41302	70
39	025	40202	0
39	025	41403	2
39	025	41200	34
39	025	40102	0
39	025	40800	1
39	025	41304	13
39	025	41101	4
39	025	41000	ד ג
39	025	41701	0
39	025	40203	5 Д
39	025	40101	
39	025	40300	<u> </u>
50	020	10000	

39	025	40401	6
39	025	40402	35
39	025	40500	3
39	025	41401	33
39	025	40900	0
39	025	41600	0
39	025	41900	1
39	025	41702	0
39	025	42000	9
39	025	41404	93
39	025	41501	18
39	061	21505	7
39	061	21572	57
39	061	23521	31
39	061	20742	5
39	061	20505	15
30	061	20741	15
30	061	20705	q
30	061	22601	32
30	061	2160/	5
30	061	20701	9
30	061	20701	9 100
30	061	20022	20
20	061	22102	20
29	061	21002	0
39 20	061	20702	1
39	001	21001	4
39	001	24001	03 05
39 20	061	20701	20
39	061	20707	0
39	061	23600	0
39	061	23701	2
39	061	21802	3
39	061	23702	0
39	061	20812	12
39	061	20602	6
39	061	20601	6
39	061	21101	0
39	061	25200	8
39	061	20802	9
39	061	25500	2
39	061	25300	6
39	061	20902	5
39	061	25401	0
39	061	6500	15
39	061	21001	0
39	061	5200	12
39	061	5600	4
39	061	25600	13
39	061	6600	4
39	061	25402	4

39	061	21003	0
39	061	20901	1
39	061	6800	5
39	061	21002	3
39	061	7200	48
39	061	3400	1
39	061	2900	193
39	061	21102	0
39	061	3200	46
39	061	3500	0
39	061	21201	2
39	061	3700	1
39	061	4200	5
39	061	2700	12
39	061	2300	1
39	061	1400	0
39	061	4701	e 6
39	061	1500	4
30 30	061	1700	- -
30	061	1600	1
30	061	21303	7
30	061	21303	0
30	061	301	9
30	061	24002	0 46
20	061	24902	40
39	061	9500	0
29 20	061	800	5 1
39	061	800 202	1
39	061	302	0
39	061	700	12
39	061	21302	1
39	061	21304	6
39	061	25001	12
39	061	25002	28
39	061	10500	2
39	061	21421	4
39	061	24002	52
39	061	7800	10
39	061	9400	6
39	061	21401	7
39	061	9300	11
39	061	21422	9
39	061	5000	24
39	061	4900	40
39	061	21603	9
39	061	21701	16
39	061	21702	2
39	061	22700	6
39	061	22602	3
39	061	23002	41
39	061	9700	8

39	061	9902	2
39	061	9600	7
39	061	11100	12
39	061	21900	0
39	061	20811	23
39	061	6100	0
39	061	3300	26
39	061	2600	23
39	061	2500	59
39	061	200	0
39	061	10201	12
39	061	10100	15
39	061	8900	1
39	061	6202	0
39	061	5100	2
39	061	4800	11
39	061	2200	4
39	061	2000	6
39	061	1900	7
39	061	2100	0
39	061	1800	1
39	061	1100	2
39	061	1300	2
39	061	4603	1
39	061	1200	3
39	061	24700	1
39	061	4602	14
39	061	6400	1
39	061	23902	30
39	061	23901	111
39	061	24100	21
39	061	23222	39
39	061	22900	0
39	061	6000	84
39	061	22800	2
39	061	23201	11
39	061	22400	1
39	061	22500	29
39	061	23501	164
39	061	23210	107
39	061	23100	90
39	061	23400	6
39	061	5701	2
39	061	5900	3
39	061	5300	17
39	061	23800	5
39	061	5800	5
39	061	6300	2
39	061	5702	3
39	061	5400	6

39	061	6201	0
39	061	23300	50
39	061	11000	0
39	061	8202	5
39	061	25800	5
39	061	8400	7
39	061	7900	6
39	061	8201	10
39	061	8501	13
39	061	25700	0
39	061	22200	21
39	061	8000	6
39	061	24200	13
39	061	8300	15
39	061	10800	4
39	061	5500	7
39	061	8100	3
39	061	7100	97
39	061	8502	0
39	061	7700	ů 0
39	061	7300	1
39	061	7500	12
39	061	7400	.3
39	061	7000	55
39	061	6900	10
39	061	6700	4
39	061	3600	0
39	061	21202	6
30 30	061	9200	14
30 30	061	4000	5
30	061	3800	5
30 30	061	3900	1
30 30	061	4100	5
30	061	9901	3
30	061	8700	7
30	061	3000	2/1
30	061	10202	241
30	061	10202	1
20	061	10900	16
39	061	10002	10
39	061	10001	197
39	061	0800	0
39 20	061	9600	1
39 20	061	8800	1
39 20	061	2800	9
39	061	2000	2
39 20	001	21000	9
39 20	001	24321	107
39 20	001	210/1	15
39	001	∠10U8	32
39	061	20101	4

39	061	25101	24
39	061	25102	73
39	061	25103	47
39	061	20502	15
39	061	21509	12
39	061	21504	288
39	061	22000	3
39	061	22101	7
39	061	20501	5
39	061	4601	27
39	061	4702	0
39	061	24400	152
39	061	9100	2
39	061	20504	7
39	061	21501	53
39	061	24303	69
39	061	24301	160
39	061	26002	3
39	061	26002	1
30	061	26102	0
30	061	26200	1
30	061	20200	7
30	061	24500	Λ
30	061	24300	4
30	061	2/800	6
20	061	24000	0
39 20	061	24901	10
39	001	20104	12
39	061	10000	0
39	061	22302	00
39	061	10400	3
39	061	600	C ⊿
39	061	4400	1
39	061	10300	5
39	061	400	3
39	061	4300	3
39	061	4500	1
39	061	25900	0
39	061	22301	50
39	061	23001	190
39	061	24322	147
39	061	100	0
39	165	30504	26
39	165	30800	1
39	165	31700	0
39	165	31500	5
39	165	31400	1
39	165	31300	7
39	165	31902	68
39	165	30503	2
39	165	32006	42

39	165	30600	0	
39	165	31904	56	
39	165	32005	110	
39	165	32201	4	
39	165	32003	36	
39	165	32300	4	
39	165	32500	14	
39	165	30200	0	
39	165	32100	10	
39	165	30900	40	
39	165	31000	3	
39	165	30700	11	
39	165	31100	0	
39	165	32007	63	
39	165	32400	0	
39	165	32202	0	
39	165	30102	0	
39	165	30501	14	
39	165	30101	0	
39	165	31903	77	
39	165	32004	86	
39	165	31200	21	
39	165	31600	17	

Table 7

1990 US Census tract data (Butler, Clermont, Hamilton, Warren)

STATE	COUNTY	TRACT	ASIAN INDIAN
30	017	12800	POPULATION
30	017	1100	0
30	017	400	10
30	017	11102	201
30	017	11102	201
39	017	11110	28
39	017	900	20
39	017	13200	0
39	017	13300	0
39	017	13400	6
39	017	10906	55
39	017	10904	3
39	017	100	0
39	017	10201	14
39	017	10103	25
39	017	10102	20
39	017	10104	47
39	017	10101	19
39	017	12300	3
39	017	12700	0
39	017	12600	1
39	017	13100	0
39	017	12900	0
39	017	13800	0
39	017	13900	0
39	017	13500	0
39	017	600	0
39	017	500	0
39	017	11001	18
39	017	1002	1
39	017	1200	0
39	017	1300	1
39	017	1001	4
39	017	11109	5
39	017	10903	59
39	017	11200	3
39	017	12500	5
39	017	13600	12
39	017	11101	0
39	017	701	0
39	017	200	0
39	017	10700	0
39	017	11801	0
39	017	11300	0

39	017	13000	0
39	017	14000	0
39	017	11802	0
39	017	11900	0
39	017	10500	0
39	017	702	0
39	017	800	0
39	017	12100	0
39	017	12000	0
39	017	12400	4
39	017	10600	1
39	017	11106	14
39	017	10203	0
39	017	11107	4
39	017	10909	15
39	017	11111	43
39	017	10907	16
39	017	10908	28
30	017	11104	20 74
30	017	300	0
30	017	10800	0
30	017	10000	0
30	017	10202	0
39	017	10202	4
39	017	10902	12
39	017	10300	0
39	017	12200	0
39	017	13700	1
39	017	11002	3
39	017	1400	0
39	025	40701	4
39	025	40702	4
39	025	40600	5
39	025	41800	1
39	025	41302	8
39	025	41200	4
39	025	40202	0
39	025	40800	0
39	025	41301	13
39	025	41100	1
39	025	41000	0
39	025	40300	11
39	025	40401	0
39	025	40402	2
39	025	40500	5
39	025	41401	16
39	025	40900	0
39	025	41600	0
39	025	41900	0
39	025	41700	0
39	025	42000	0

39	025	41402	22
39	025	41500	28
39	025	40201	2
39	025	40100	0
39	061	21505	3
39	061	23502	74
39	061	20704	8
39	061	20505	8
39	061	21602	0
39	061	21604	0
39	061	20701	10
39	061	20601	11
39	061	20707	5
30	061	22102	21
30	061	20705	10
30	061	23600	0
20	061	23000	5
29	001	21001	5
39	001	21002	Z
39	001	20002	12
39	061	23701	4
39	061	23702	0
39	061	24001	8
39	061	20802	0
39	061	21101	0
39	061	25200	0
39	061	25300	6
39	061	5200	2
39	061	25500	15
39	061	21001	0
39	061	25600	3
39	061	5600	0
39	061	25401	4
39	061	21002	0
39	061	25402	0
39	061	6500	9
39	061	20901	0
39	061	6800	1
39	061	6600	3
39	061	24800	0
39	061	20902	9
39	061	7200	66
39	061	21003	0
39	061	21102	0
39	061	21201	0
39	061	3200	20
39	061	2900	58
39	061	3700	1
39	061	2700	14
39	061	3400	2
39	061	4200	10
~~	001		10

39	061	3500	0
39	061	24902	28
39	061	4701	6
39	061	2300	2
39	061	1600	0
39	061	21303	1
39	061	21302	2
39	061	1500	2
39	061	1700	0
39	061	301	0
39	061	1000	1
39	061	900	0
39	061	800	0
39	061	9500	3
39	061	302	0
39	061	700	22
39	061	21304	4
39	061	25001	10
39	061	25002	25
39	061	24002	30
39	061	7800	6
39	061	9400	5
39	061	21401	0
39	061	9300	2
39	061	21402	3
39	061	5000	7
39	061	4900	11
39	061	21603	5
39	061	21700	6
39	061	22700	1
39	061	22600	18
39	061	23002	7
39	061	9700	0
39	061	9902	0
39	061	9600	9
39	061	20706	28
39	061	21900	0
39	061	11100	4
39	061	20801	55
39	061	6100	0
39	061	3300	23
39	061	2600	35
39	061	2500	13
39	061	200	0
39	061	10201	2
39	061	10100	5
39	061	8601	0
39	061	8900	1
39	061	5100	4
39	061	4800	10

39	061	2200	2
39	061	2000	1
39	061	2100	0
39	061	1900	1
39	061	1100	0
39	061	1800	1
39	061	4603	1
39	061	1300	3
39	061	1200	1
39	061	24700	1
39	061	4602	5
39	061	6202	0
39	061	6400	6
39	061	23900	100
39	061	24100	21
39	061	22900	5
39	061	6000	15
39	061	22800	3
39	061	23201	5
39	061	22400	1
39	061	22500	0
39	061	23501	69
39	061	23202	29
39	061	23100	88
39	061	23400	0
39	061	5701	4
39	061	5900	0
39	061	5300	14
39	061	23800	5
39	061	5800	1
39	061	6300	15
39	061	5702	5
39	061	5400	0
39	061	6201	3
39	061	23300	33
39	061	11000	1
39	061	8202	0
39	061	25800	6
39	061	8400	0
39	061	7900	1
39	061	8201	3
39	061	8501	10
39	061	25700	7
39	061	22200	21
39	061	8000	1
39	061	24200	19
39	061	8300	36
39	061	10800	3
39	061	5500	2
39	061	8100	4

39	061	7100	40
39	061	8502	0
39	061	7700	0
39	061	7300	0
39	061	7500	2
39	061	7400	3
39	061	6900	10
39	061	6700	3
39	061	3600	0
39	061	1400	0
39	061	9200	5
39	061	3800	1
39	061	4000	1
39	061	3900	0
39	061	4100	5
39	061	10700	1
39	061	9901	1
30	061	8700	0
30	061	3000	232
30	061	10202	202
30	061	21202	7
20	061	21202	7
20	061	10900	14
39 20	061	10002	14
39	061	10001	20
39	061	9000	10
39	061	8800	10
39	061	7000	19
39	061	2800	2
39	061	21506	11
39	061	21508	12
39	061	21507	20
39	061	25101	19
39	061	25102	48
39	061	25103	6
39	061	20502	0
39	061	21504	32
39	061	21509	2
39	061	22000	0
39	061	22101	7
39	061	20501	4
39	061	4601	20
39	061	4702	4
39	061	24400	83
39	061	20504	4
39	061	24301	32
39	061	21501	48
39	061	24303	11
39	061	26100	1
39	061	26000	0
39	061	26200	0

39	061	20402	5
39	061	24500	0
39	061	24901	0
39	061	20401	0
39	061	25104	9
39	061	10600	0
39	061	10500	0
39	061	22302	39
39	061	600	2
39	061	10300	2
39	061	10400	- 1
39	061	400	0
39	061	4300	0
30	061	4400	0
30	061	25000	1
30	061	20300	1/
20	061	22001	21
39	061	23001	∠ I 101
39	061	24302	191
39	061	9100	0
39	061	100	0
39	061	4500	0
39	165	30800	0
39	165	31700	0
39	165	31500	1
39	165	31400	8
39	165	31300	2
39	165	31902	7
39	165	30502	21
39	165	30600	0
39	165	31904	4
39	165	32003	12
39	165	32300	1
39	165	30300	0
39	165	30400	0
39	165	30200	0
39	165	32100	0
39	165	30900	0
39	165	30700	5
39	165	31000	0
39	165	31100	0
39	165	32002	16
39	165	30501	0
39	165	30101	0
30	165	30102	0
30	165	31003	0
30	165	32001	23
30	105	31600	20
39	100	31000	ა ი
39 20	100	31200	2
39	100	32400	U
39	165	32200	U

Table 8

1980 US Census tract data (Butler, Clermont, Hamilton, Warren)

STATE	COUNTY	TRACT	ASIAN INDIAN POPUI ATION
39	061	21002	0
39	061	6600	1
39	061	7200	22
39	061	21003	0
39	061	3200	7
39	061	2900	25
39	061	3700	4
39	061	4701	3
39	061	1700	1
39	061	301	0
39	061	1000	0
39	061	900	2
39	061	302	0
39	061	4900	11
39	061	2200	12
39	061	2000	2
39	061	2100	0
39	061	23400	10
39	165	31700	1
39	017	10203	0
39	061	25102	17
39	061	25103	2
39	017	1100	0
39	017	11101	0
39	017	701	0
39	017	400	2
39	017	11102	40
39	017	900	1
39	017	200	2
39	017	13400	0
39	017	13300	0
39	017	12800	1
39	017	13200	3
39	017	10904	5
39	017	100	3
39	017	10700	3
39	017	10102	9
39	017	10104	12
39	017	10101	4
39	017	10201	0
39	017	10103	17
39	017	11801	2
39	017	11300	0
39	017	12300	1

39	017	12700	0
39	017	12600	4
39	017	12900	1
39	017	13100	0
39	017	13800	1
39	017	13900	1
39	017	14000	1
39	017	13000	0
39	017	13500	1
39	017	11802	1
39	017	11900	0
39	017	600	2
39	017	500	1
39	017	11001	3
39	017	800	2
39	017	10500	0
39	017	702	2
39	017	1002	2
39	017	1400	0
39	017	1300	0
39	017	1200	4
39	017	1001	3
39	025	40600	0
39	025	40800	0
39	025	41100	59
39	025	41000	12
39	025	40700	5
39	025	41800	1
39	025	41300	8
39	061	21505	5
39	061	22101	4
39	061	20704	4
39	061	21602	0
39	061	21604	0
39	061	22102	20
39	061	20705	12
39	061	23600	0
39	061	21801	0
39	061	21802	0
39	061	23701	0
39	061	23702	0
39	061	24001	12
39	061	20802	0
39	061	25200	4
39	061	25300	2
39	061	5200	0
39	061	25500	3
39	061	21001	3
39	061	25600	0
39	061	5600	2

39	061	25401	0
39	061	25402	3
39	061	6500	6
39	061	20901	1
39	061	6800	0
39	061	24800	3
39	061	20902	1
39	061	21201	0
39	061	2700	1
39	061	3400	2
39	061	4200	0
39	061	3500	0
39	061	2300	1
39	061	1600	0
39	061	21302	4
39	061	1500	0
39	061	800	0
30 30	061	9500	1
30 30	061	700	1
30	061	25001	12
30	061	20501	1
30	061	20301	1
30	061	21500	1
20	061	21009	0
29 20	061	22000	0
39 20	001	20701	2
39	061	20502	0
39	061	21100	0
39	061	21301	3
39	061	24600	5
39	061	20600	15
39	061	21504	24
39	061	24002	34
39	061	7800	8
39	061	9400	2
39	061	21401	0
39	061	21402	15
39	061	9300	9
39	061	5000	5
39	061	21603	11
39	061	21700	6
39	061	22700	0
39	061	22600	13
39	061	23002	0
39	061	9700	12
39	061	9902	1
39	061	9600	8
39	061	20706	26
39	061	21900	0
39	061	11100	5
39	061	20801	30

39	061	6100	0
39	061	3300	3
39	061	2600	21
39	061	2500	10
39	061	200	0
39	061	10201	3
39	061	10100	0
39	061	8601	4
39	061	8900	1
39	061	5100	0
39	061	4800	6
39	061	1900	0
39	061	1100	0
39	061	1800	1
39	061	4603	1
30	061	1300	1
30	061	1200	0
30	061	24700	0
39	061	24700	0
29	061	4001	21
39	001	4002	0
39	001	4702	0
39	001	6202	4
39	061	6400	0
39	061	23900	54
39	061	24100	7
39	061	22900	3
39	061	6000	3
39	061	22800	0
39	061	23201	2
39	061	22400	6
39	061	22500	6
39	061	23500	51
39	061	23202	17
39	061	23100	32
39	061	5701	4
39	061	5900	2
39	061	5300	3
39	061	23800	5
39	061	5800	4
39	061	6300	31
39	061	5702	17
39	061	5400	0
39	061	24400	28
39	061	6201	4
39	061	23300	28
39	061	11000	6
39	061	8202	6
39	061	25800	3
39	061	8400	0
39	061	7900	6

39	061	8201	5
39	061	8501	44
39	061	25700	0
39	061	22200	10
39	061	8000	1
39	061	24200	1
39	061	8300	16
39	061	10800	0
39	061	5500	1
39	061	8100	0
39	061	7100	21
39	061	8502	0
39	061	7700	5
39	061	7300	1
39	061	7500	0
39	061	7400	5
39	061	6900	3
39	061	6700	0
39	061	3600	1
39	061	1400	0
39	061	9200	3
39	061	3800	2
39	061	4000	1
39	061	3900	0
39	061	4100	0
39	061	10700	0
39	061	9901	1
39	061	8700	0
39	061	3000	120
39	061	10202	0
39	061	21202	3
39	061	10900	0
39	061	10002	13
39	061	10001	34
39	061	9800	3
39	061	8800	0
39	061	7000	13
39	061	2800	1
39	165	30800	0
39	165	32003	8
39	165	32300	1
39	165	30200	0
39	165	30400	0
39	165	30300	1
39	165	31500	0
39	165	31400	0
39	165	31300	0
39	165	31902	1
39	165	32100	0
39	017	12100	4

39	017	12000	0
39	017	12400	4
39	017	10903	10
39	017	11104	4
39	017	300	0
39	017	10901	8
39	017	11106	0
39	017	11105	52
39	017	11103	13
39	017	10905	34
39	017	10800	0
39	017	10202	1
39	017	10902	9
39	017	10300	8
39	017	11200	6
39	017	12500	0
39	017	13600	3
39	017	12200	0
39	017	13700	0
39	017	11002	0
39	017	10600	1
39	025	40300	5
39	025	40500	4
39	025	40900	5
39	025	41600	14
39	025	41700	1
39	025	42000	2
39	025	41900	0
39	025	40400	13
39	025	41200	1
39	025	41500	14
39	025	41400	22
39	025	40200	0
39	025	40100	0
39	061	21501	42
39	061	21506	14
39	061	21508	17
39	061	21507	26
39	061	24500	1
39	061	20401	0
39	061	25101	18
39	061	20402	0
39	061	20100	2
39	061	20300	0
39	061	20200	0
39	061	20503	0
39	061	10600	0
39	061	10500	0
39	061	24900	21
39	061	25104	4

39	061	25002	8
39	061	22302	6
39	061	600	1
39	061	10400	0
39	061	10300	1
39	061	400	0
39	061	4300	0
39	061	4400	0
39	061	25900	0
39	061	22301	12
39	061	23001	15
39	061	24300	60
39	061	9100	0
39	061	100	0
39	061	4500	0
39	165	30900	0
39	165	30700	10
39	165	31000	1
39	165	31100	0
39	165	32002	0
39	165	32001	0
39	165	31901	0
39	165	30101	0
39	165	30600	0
39	165	30102	1
39	165	30500	5
39	165	31200	0
39	165	31600	8
39	165	32400	0
39	165	32200	0