Analysing Role of Culture in Ethnic Segregation and Congregation in Sydney Australia

Awais Piracha and Tingting Cui

University of Western Sydney
email corresponding author: a.piracha@uws.edu.au

Abstract

The dynamics of ethnic segregation or congregation are especially pronounced in the global cities due to the presence of large and increasing number of immigrants. Most of the past research on segregation/congregation has pointed to the social-economic factors such as household income, English proficiency and education level as the major determinants that lead to ethnic segregation or concentration. Focusing on the context in Sydney, this paper presents research findings that demonstrate cultural origins also have strong influence on the level of ethnic congregation. The research for the first time utilises the centrograpic method to investigate the spatial distribution pattern of ethnic populations in Sydney using the census data for religious affiliation and the country of birthplace at a fine grain suburban scale. This paper presents detailed analysis of congregation/segregation of immigrant communities as well as an in-depth discussion on what explains such patterns. Key words: ethnic segregation, Sydney, centrographic method, Geographic Information Systems

1. Introduction

The issue of ethnic segregation and congregation is a recurrent research theme, due to its profound (potential) social impacts. Ethnic segregation and/or congregation occurs where members of a minority group are not dispersed across residential spaces in relation to the rest of the population (Knox & Pinch, 2010) As Berry and Laponce (1994) point out, ethnic segregation is a major source of social tensions and political conflicts, and there is a need for more creative and in-depth research both in academic theory and at the practice level. The main concern is that the firm and lasting concentration, regardless of the community profiles such as socio-economic status, will prevent members in the communities from communicating with the wider society. In the severe form, for example, in some American cities, the disadvantages of living in these areas are profound and can be passed down the generations. Children in these areas would have less vocational and educational opportunities and might be stigmatised to poverty and disadvantage (Burnley, 1999). Also, this strong residential distribution pattern has generated severe impacts on the housing market. For example Chinese property developers and real estate firms have targeted their market to people from Hong Kong and Taiwan in the Monterey Park in Los Angeles (Pamuk, 2004).

Sydney is a city of immigration on a world scale. In 2006, 1,630,359 people were born overseas, which accounts for 39.6% of its total population. The high level of cultural diversity stimulates economic development at local and regional levels and improves Sydney's prospects as a global city (Burnley, 1999). However, there are also concerns that Sydney will experience a high level of social polarisation similar to the ghettos of Hispanic-Americans and/or African-Americans in US cities (Healy, 1996). It is thus important to carefully analyse the spatial distribution and the extent of concentration of these immigrant communities.

Most of the major models and theories on ethnic segregation/congregation focus on the US cities' context. However, this research may not be sufficient in guiding decision-makers or planning educators to deliver appropriate planning policies and education programs in Australia, as the immigration and cultural context are very different from America. Therefore, more focused analysis of Sydney's unique ethnic residential distribution patterns is required. Although recent research on Sydney's ethnic segregation/congregation suggests that it is not severe like in ghettos in the US cities, strong segregation/congregation exists in some areas

for some ethnic communities in western Sydney (Burnley, 1999). The existing research on Sydney focuses on analysing the ethnic components using Index of Segregation (IS) on Statistical Local Area (SLA) or Census Collection District (CCD). This paper attempts to explore the dynamic patterns of ethnic segregation/congregation trends at a finer suburban spatial scale.

There are three aims of this research. Firstly, it seeks to explore the spatial distribution patterns of ethnic communities in the Sydney metropolitan area who were born overseas. Secondly, it aims to analyse which of the investigated ethnic groups are more segregated or congregated than others, and in which locations these concentrations tend to occur. Thirdly, the research looks into the possible explanations of the pattern of segregation or congregation found in Sydney.

This paper first conducts a review of the studies on ethnic segregation, with particular focus on the reasons leading to ethnic segregation, the types of segregation, and the effects and outcomes generated by segregation. Then, it compares the methods and indices previously used to measure the level of segregation. After that, it utilizes the centrographic method in assessing the level of ethnic segregation/congregation using the birthplace data. In the end, the report draws conclusions on the spatial segregation patterns in Sydney.

2. Ethnic segregation / congregation and its dynamics

Most of the American research on ethnic spatial distribution attempts to explore the ethnic segregation/congregation patterns among Black and Hispanic ‘ghettos’ in the US cities. Research has identified that such severe form of ethnic segregation/congregation is the result of the immigration history and economic context of the US. The rapidly increasing industrialization in the early 20th century and the fast growing status of America in the world in the late 20th century and early 21th century greatly increased the demand for labour. The motivation was to fills jobs, mostly unskilled, in manufacturing and low-level services. In response, a vast number of Black and Hispanic people migrants filled this gap. Housing for these immigrants was quite often built near the manufacturing plants, resulting in high concentrations of Blacks and Hispanic workers. In addition, after the World War I, the United States became increasingly isolationist, and partly as a result, the flow of European immigrants was sharply reduced (Massey & Denton, 1993). These factors contributed to the development of ghettos in the US cities.

Even though the dynamics and factors of the America's ghetto-form segregation are very unique and different from the situations in other countries, it still has generated a great amount of concern in other countries that similar segregation will happen and will generate severe social problems. Studies have been conducted on the ethnic residential patterns among the major cities in the world such as Amsterdam (Deurloo & Musterd, 1998), and Paris (Rhein, 1998). All these studies suggest that the spatial segregation of immigrant groups in these cities is far from the ghetto-type segregation as in the US cities. But still there are considerable ethnic segregation/congregation patterns existing. Such segregation/congregation comprises a highly complex set of demographic and social processes that are far more complex than the classical or newly established models (Rhein, 1998). Also, the process of ethnic segregation/congregation is unique according to the different social, economic, demographic and political context of the cities in different countries. Therefore, the comprehensive understanding of the ethnic segregation/congregation in different nations is important for appropriate policy response.

Numerous factors contribute to ethnic segregation. These include cultural and religious requirements, language, socio-economic status, preference, etc. In general, the variable influence of these factors on location outcomes can be classified in two categories, namely, self-congregation and the forced segregation, each with their own temporal and spatial relationships.

Self-congregation occurs when individuals, families and groups of a particular ethnicity have a greater level rather than lower level of choice to locate with others of the same or similar ethnicity for social, cultural and economic reasons. In Urban Social Geography, Knox and Pinch (2010) argue that gathering occurs because of mutual support within group members. People are more likely to seek help and support from ones who share similar cultural or language backgrounds since communications are more convenient. The second reason for self-congregation is cultural preservation. Residential congregation to a considerable extent supports the viability of ethnic institutions and businesses since it can generate a large consumer threshold. Thirdly, .the desire to create cohesiveness leads minority groups to cluster. For example, the members of minority groups may gather together for defending against discrimination and other hostility from the wider society (Knox & Pinch, 2010).

In this regard, colonies and enclaves are usually referred to as this type of self-congregation. 'Colonies' are relatively small and temporary congregation of ethnicities. Members of each ethnicity seek temporary support when they first enter into a new environment. 'Enclaves' are used for groups or areas in parts of cities, and they are affected by the internal co-

hesion within the group members. Compared to 'colonies', 'enclaves' are more stable. For both 'colonies' and 'enclaves' the external effects of discrimination are likely to be minimal. For example, the Irish, Polish, German and Italian communities in American cities are usually considered to be 'enclaves' (Peach, 1975). Although some scholars argue that any form of ethnic segregation/congregation may generate negative effects since it reduces the opportunities the ethnic members of communicating with the wider society, many cultural studies have addressed that immigrants benefit from such concentration as well (Dunn, 1998).

In comparison with self-congregation, forced segregations have received more attention in scholarly studies (Bashi & Hughes, 1997, Hamnett, 1994, Racine, 2002). Segregation occurs when individuals, families and groups of a particular ethnicity have a lower level, rather than a higher level of choice to locate with others of the same or similar ethnicity due to social or economic status. Such segregations are formed by external social forces or economic limitations. Ethnic groups with particular racial or religious backgrounds are discriminated or excluded by the majority groups and have to gather within areas of low-quality living conditions. This congregation, in turn, generates further disadvantages to ethnic communities because of the decrease in social exposure and communications with wider urban contexts (Knox & Pinch, 2010). One example in this case is the frequently discussed 'ghettos' in the downtown centres in many American cities. The areas are occupied by African-American or Hispanic-American minorities. People within these areas often suffer from undesirable physical and social environment. The living conditions and supporting infrastructure is of low quality, and the areas usually experience high rates of poverty and unemployment (Green & Pick, 2006). In addition, such socio-economic disadvantages of the residents tend to pass down to next generations - that is by virtue of their being born in a ghetto area, children would have less vocational and educational opportunities and might be condemned to poverty and disadvantage. (Burnley, 1999).

The external impacts from social and economic transformation may strengthen the effects of ethnic segregation/congregation. It is generally perceived that the process of globalisation has accelerated ethnic segregation (Sassen, 2003, Pamuk, 2004). Globalisation fosters economic development in global cities and therefore stimulates job demand. However, due to the required labour distribution in the new economic structure, jobs become polarised at the high-skill and low-skill ends of the occupational spectrum, with a hollowing out of mid-level occupations (Castell, 1989). In response, a great number of immigrants arrive to these global cities to seek employment opportunities. These immigrants who hold limited language proficiency and familiarity with the local labour market tend to par-

ticipate in the low-skill occupations. As a result of the aforementioned interactive factors, the globalisation intensifies migrant segregations. After reviewing the globalisation process in Sydney, Baum (1997) confirmed this process.

Another external factor affecting ethnic segregation/congregation is policies, particularly, migration policies. Indeed, migration policies in different periods of time reflect labour and population requirements of host nations. These migration policies set out some incentives to attract certain type of applicants. Some of these incentives and restrictions directly relate to ethnic backgrounds and result in immigrants with similar ethnic backgrounds coming in a relatively short period of time. For example, the White Australia Policy in Australia, which had restricted immigration from non-white regions, generated great impact on segregation/congregation for some ethnic groups. After the year 1973 when the White Australia Policy was abolished, a sudden increase in immigration from the Middle East, Asia and South America resulted in these ethnic groups to segregate/congregate more than their Southeast European counterparts who had a long immigration history in Australia starting from as early as the 1940s (Burnley, 1999).

Research conducted by Dunn (1998) in Cabramatta in Sydney suggested that some level of residential congregation can generate positive impacts for immigrants. However, there are also critics of ethnic segregation since segregation can limit individual and family choices within an ethnic group and can slow the exchange of knowledge and experiences between people in the ethnic group and the wider society (Racine, 2002).

3. Ethnic segregation in Sydney

The significance of studying segregation patterns in Sydney is widely accepted due to its profound impacts on the housing market, political interests and society as a whole (Johnston, Forrest, & Poulsen, 2001) (Burnley, 1999). Most previous studies have suggested that Sydney does not suffer from segregations as severe as the ‘ghettos’ in many US cities, but there is indeed some considerable level of segregation/congregation identified for some minority groups (Burnley, 1975) (Burnley, 1999) (Johnston, Forrest, & Poulsen, 2001).

As discussed above, processes of ethnic segregation/congregation is rather complex which involves factors relating to preferences of ethnic community members, external social exclusion, social-economic status of ethnic groups, labour market requirement, and political decisions. There-

fore, studies that measure the level of segregation/congregation and research on the dynamics leading to segregation/congregation should be comprehensive. Massey and Denton (1988) have developed five dimensions that describe the spatial expression of ethnic segregation/congregation:

1. Evenness. This refers to the differential distribution of two social groups among areal units in a city. A minority group is considered to be segregated if it is unevenly distributed over areal units. It is always measured and scaled relative to some other groups. The Index of Dissimilarity (ID) and the Index of Segregation (IS) are the most commonly used methods to measure the level of evenness of a group. For these indices, calculations are conducted comparing the proportion of each minority group and the proportion of the majority group (ID) or the proportion of the remaining population (IS) for a particular spatial scale.
2. Exposure. This refers to the degree of potential contact, or the possibility of interaction, between minority and majority group members within geographic areas of a city. Indices of exposure measure the extent to which minority and majority members physically confront one another by virtue of sharing a common residential area.
3. Concentration. This refers to the amount of physical space occupied by a minority groups in the city. Groups that occupy a small share of the total area in a city are considered to be residentially concentrated. Relatively few indices of spatial concentration have been proposed.
4. Centralisation. This is the degree to which an ethnic group is spatially concentrated near the centre of an urban area, with segregation processes confining minorities to declining, inner city areas. Groups that settle near centre city areas usually tend to be spatially concentrated.
5. Clustering. This refers to the degree of spatial clustering exhibited by minority groups that is the extent to which areal units inhabited by minority members adjoin one another, or cluster, in space. The critical conceptual point is contiguity, with the implication that, if all minority areas in one city are contiguous, but in another they are spatially separated, the former would be considered as more segregated (Johnston, Forrest, & Poulsen, 2001).

The existing studies on ethnic segregation/congregation of Sydney generally apply the measurement of ID or IS. These relative indices only evaluate the level of evenness between minority and majority groups. The method used in the previous studies cannot identify the differences between minorities in different spatial locations in the city if these minorities have the same ID or IS score. Burnley (1999), compared the ID and IS for

each ethnic group based on data at Statistical Local Areas (SLAs) and Census Collector Districts (CCD) levels. He further studied the associations between residential concentration and the disadvantage conditions of low family income, unemployment and low home ownership. Johnston et al (1999) performed a similar study on the ethnic segregation in Sydney. However, the data were at the coarse local government areas (LGAs) level and only the measure of ID was used.

Due to such neglect in assessing the important factors, the index-based measure is not reliable to distinguish the differences in segregation between different ethnicities. Indeed, since the previous studies have tried to respond to the concerns that Sydney would experience the severe segregation problems faced in many US cities, the comparatively robust index-based measurements were sufficient. As the findings suggested the segregation in Sydney is much less evident, there is a need for more comprehensive measurements that are capable of considering the distinct features of each ethnicity.

4. Methodology

4.1. Centrographic methods for measuring ethnic segregation/ congregation

The centrographic method overcomes the coarseness that methods such as the index of dissimilarity face i.e. their inability to measure the spatial distribution of population. The method applies spatial analyses using geographic information systems (GIS) and statistical analyses to identify the spatial relationship of ethnic groups to the reference community. It measures segregation by taking into account the reference community, as well as the surrounding area, and determining the extent of concentration of dispersal around a core point. This method can answer questions about which racial groups in a city are more or less dispersed (Green & Pick, 2006). In this way, the method can make a good response to the issues of concentration, centralisation and clustering identified in Massey and Denton's (1988) work.

The *Mean Centre* is the centre of gravity of a particular ethnic community. It is identified using x,y coordinates representing longitude and latitude position of ethnic concentration. *Mean Centre* is a measure of spatial central tendency analogous to the classical statistics of mean and weighted mean. It is useful in summarising the overall location of an ethnic community. From the location of *Mean Centre*, the general trends and features of

a particular social group or groups can be identified and compared (Wong, 1999).

The *Standard Deviation Ellipse* measures the amount of dispersion of the attributes across the area. It is an improved centrographic technique derived from *standard radius*. The distance of ellipse from *Mean Centre* shows how concentrated or dispersed a characteristic is spatially. For each ellipse, the method provides calculations of the weighted mean centre, and the dispersions for the long and short axes of the ellipse. The extent of integration or segregation can be approximated by the sizes of the two or more ellipses, each representing an ethnic group. The area of a *Standard Deviation Ellipse* covers about two-thirds of one ethnic population. In addition, the ellipse offers the added value of indicating the spatial direction of greatest dispersion. The ellipse can reflect the orientation of a set of locations around the *Mean Centre*.

The Mean Centre together with Standard Ellipse can reveal the spatial pattern of the segregation/congregation of a selected ethnic group (Wong, 1999).The formulation for the x and y coordinates of the weighted mean centre and x and y distances of the standard deviation ellipse are shown in Table 4.1.

Table 4.1. The Fomulation for the Centrographic Method *Source: (Wong, 1999)*

Types	Statistics	Formulae
Spatial Central Tendency	Mean Centre	$(\bar{x}, \bar{y}) = \left(\frac{\sum f_1 x_i}{\sum f_i}, \frac{\sum f_1 y_i}{\sum f_i}\right)$
Spatial Dispersion	Standard Distance	$SD = \sqrt{\frac{\sum f_i (x_i - \bar{x})^2 + \sum f_i (y_i - \bar{y})^2}{\sum f_i}}$
Spatial Dispersion and Orientation	Standard Deviational Ellipse: Angle of Rotation	$\tan\theta = \left(\sum {x'_i}^2 - \sum {y'_i}^2\right) + \frac{\sqrt{\left(\sum {x'_i}^2 - \sum {y'_i}^2\right)^2 + 4\left(\sum {x'_i}^2 - \sum {y'_i}^2\right)^2}}{2\sum x'_i - \sum y'_i}$
	Deviation along x,	$\delta_x = \sqrt{\frac{\sum\left(x'_i \cos\theta - y'_i \sin\theta\right)^2}{n}}$
	Deviation along y	$\delta_y = \sqrt{\frac{\sum\left(x'_i \sin\theta - y'_i \cos\theta\right)^2}{n}}$

4.2. The research procedure

The census information on birthplaces indicator is commonly utilized for measuring and studying ethnic segregation (Burnley, 1999, Johnston, Forrest, & Poulsen, 2001). It provides information about cultural backgrounds. The investigated birthplaces are based on the list of expanded community profiles provided via the Australian Bureau of Statistics (ABS) website.

Census information comprising the birthplace data was obtained in the larger group categories and the sub-group individual countries at the spatial scale of the State Suburbs in the Sydney metropolitan area. The data was derived from the customised tables requested directly from the ABS website.

The ASGS 2010 map of NSW State Suburbs in *shape file* format was downloaded from the ABS web site. The map of Sydney metro suburbs was then extracted from the download.

In ArcGIS 10.0, after the input of the base map and its attributes, centrographic method can be processed in two steps:

- Transforming the location to a centre at the spatial mean
- Calculating the standard X and Y distances of a Standard Deviation Ellipse (SDE)

To effectively compare and rank the level of congregation and the location of residential centres between different ethnic groups, the research simplifies the calculation process. The level of concentration is measured according to the size of standard ellipse for each population group. The ranking is conducted from the largest values to the smallest values, which indicates the least congregated group to the most congregated group.

The locations of residential centres are measured via the x coordinates of the spatial mean for each ethnic group. The ranking is conducted from the largest values to the smallest value, which indicates the locations from the East, the most desirable residential areas, to the West, the less desirable residential areas. It is from the perception that the locations to the East enjoy convenient access to the CBD and proximity to the coast, which are preferable for living. What should be noted here is that, the very Western Sydney suburbs in the mountains are also perceived to be desirable residential locations. Therefore, the research simplifies the process and assumes that the East is better that the West in terms of residential locations.

Other methods such as calculating the percentages of the population born overseas and the population that does not speak English at home have also been used via GIS, to provide a general idea of the spatial distribution situation of the ethnicities.

5. Ethnic segregation/ congregation in Sydney

5.1. Population demography of birthplaces in Sydney

The 2006 Census of Australia reveals considerable birthplace diversity in metropolitan Sydney (Table 5.1). There were 9 birthplace groups (Table 5.1). Six countries were represented with the population over 50,000: the UK, China (excluding Taiwan and Hong Kong), New Zealand, Viet Nam, Lebanon, India and The Philippines. Another eight numbered between 20,000 and 50,000: Italy, Hong Kong, South Korea, Greece, South Africa, Fiji, Malaysia and Indonesia. Also, there were 12 with population between 10,000 and 20,000: Iraq, Sri Lanka, Germany, Egypt, United States of America, Croatia, Ireland, Malta, Poland, Former Yugoslav Republic of Macedonia (FYROM), Turkey, and Thailand. Lastly there were seven with the population less than 10,000: Japan, South Eastern Europe, Netherlands, Singapore, Canada, Bosnia and Herzegovina, and Papua New Guinea.

Table 5.1. Birthplace Diversity in Sydney, 2006. *Source*: ABS Census 2006, expanded community profile tables, customised tables.

Large Groups	Nations	Population
Americas	United States of America	15 205
	Canada	6 850
North Africa and the Middle East	Egypt	15 790
	Turkey	11 217
	Lebanon	53 537
	Iraq	19 958
North-East Asia	Hong Kong	36 541
	Japan	9 794
	China (excl. Hon Kong and Taiwan Province)	107 746
	South Korea	31 777
North-West Europe	Netherlands	8 642
	United Kingdom	148 841
	Germany	17 232
	Ireland	12 748
Oceania and Antarctica	New Zealand	74 014
	Papua New Guinea	3 296
	Fiji	26 391
South-East Asia	Philippines	50 654

	Singapore	8 536
	Thailand	10 501
	Malaysia	20 655
	Indonesia	20 119
	Viet Nam	61 848
Southern and Central Asia	India	52 135
	Sri Lanka	17 625
Southern and Eastern Europe	Poland	12 034
	South Eastern Europe	8 945
	Croatia	14 712
	Malta	12 192
	Italy	41 148
	Bosnia and Herzegovina	6 232
	Greece	31 278
	Former Yugoslav Republic of Macedonia (FYROM)	11 472
Sub-Saharan Africa	South Africa	26 927

Figures 5.1 shows the spatial distribution of the proportion of population born overseas. From the figure, it can be argued that the suburbs that hold higher proportions of ethnic populations are located in the West. Homebush, Burwood, Campsie and Hurstville are identified as suburbs with more than fifty precent population born overseas (2006 census).

Fig. 5.1. Spatial Distribution of the Proportion of Population Born Overseas

5.2. Birthplaces

The spatial distribution patterns of the USA and Canada born population is quite similar (Figure 5.2). Both of them reveal a very low level of segregation/congregation. Their population is dispersed throughout the Sydney's metropolitan. The centres for the two are located close to each other in Sydney's West Central areas.

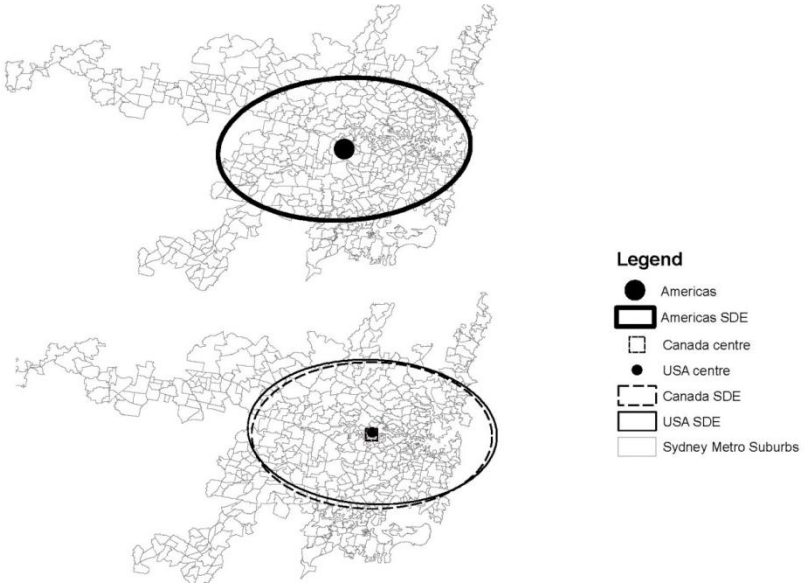

Fig. 5.2 Residential Distribution of people born in the USA and Canada

Figure 5.3. shows the spatial distribution of the people born in the Middle East. In general, people born in the Middle East have a comparatively congregated residential pattern.

It can be seen that the population born in Iraq is significantly more congregated and its concentration centre is located further in the West when compared with the population born in the other three the Middle East countries. The reason of such pattern for Iraq-born concentration may be their recent arrivals. The fast increase in house prices in the East might have led the latter arrivals to concentrate in Sydney's West. According to the ABS data, the number of arrivals from Iraq was relatively low in 1970s and 1980s. This number has markedly increased since 1991 due to the humanitarian programme (Australian Bureau of Statistics, 2006). Such trend is clearly indicated in Figure 5.4 Department of Immigration and Citizenship's (DIAC) Community Information Summary (2006) for Iraq attributes

this to the Gulf Wars and the quelling of uprisings of the Shi'a and the Kurds in Iraq. Also, the Iraq born population suffer from higher unemployment rate (22.3%) which is much higher than other Middle East countries (10.5% on average) (Australian Bureau of Statistics, 2006).

Fig. 5. 3. Residential Distribution of the people born in the Middle East

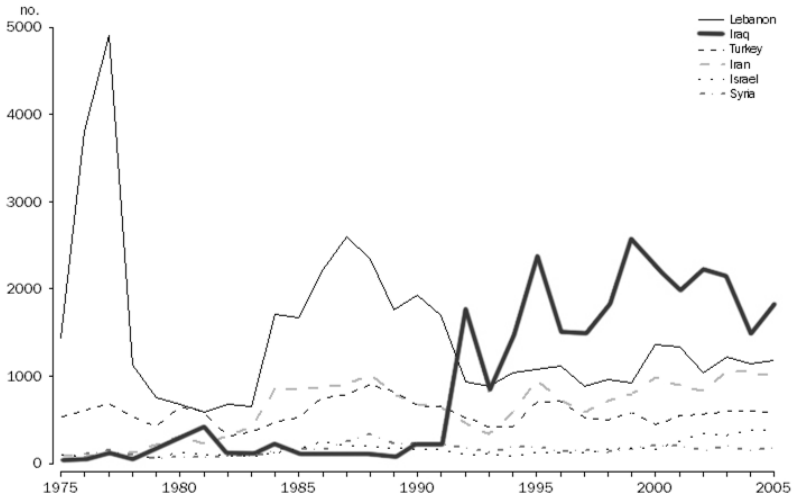

Fig. 5.4. Year of Arrival, Selected Countries of Birth *Source: ABS 2006 Census Data*

The population born in sub-Saharan Africa does not show a distinguished residential concentration pattern (Figure 5-5). Numbering 26,927 out of 44,005 born in sub-Saharan Africa, the South Africans account for the most in this group. What should be noticed is that a large proportion of this population in this group is of European-related background that probably enjoys good social-economic status. Only 38% of the South African born population is of the South African ancestry (Department of Immigration and Citizenship, 2006). The comparatively high income and employment rate perhaps contribute to the desirable spatial distribution of South African born population. The median individual weekly income for the 15 years and over South Africa-born in Australia was $708. This is very high when compared with $431 for all overseas-born and $488 for all Australian-born. The participation rate in the labour force for South Africa born population was 75.1 per cent and the unemployment rate was 4.1 per cent, much higher than the corresponding rates in the total Australian population at 64.6 and 5.2 per cent respectively (Department of Immigration and Citizenship, 2006).

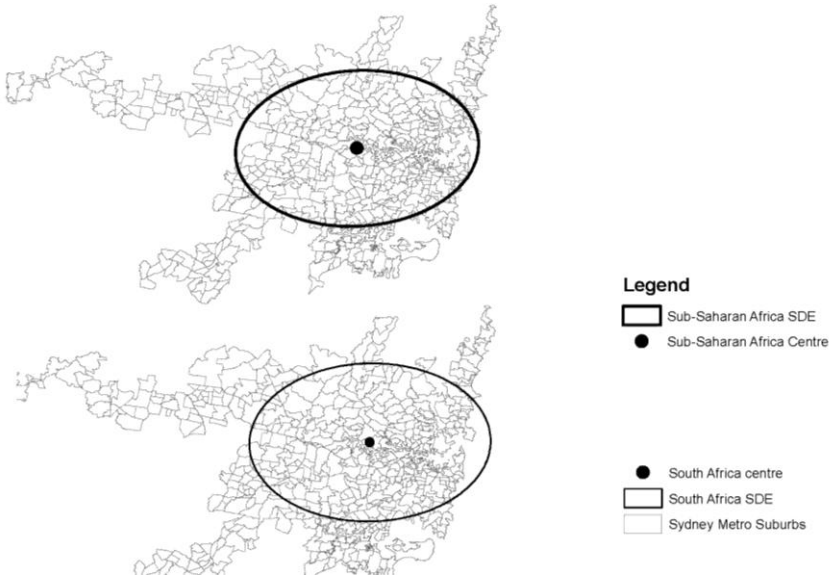

Fig. 5.5. Residential Distribution of the People Born in Sub-Saharan Africa

The residential distribution shows a more concentrated pattern of the population born in North-East Asia when compared to the population born in other regions (see Figure 5.6). All of the four investigated countries, Japan, South Korea, Hong Kong and China are congregated in the central

part of Sydney. In particular, the Japanese born people are located in the very East, which is considered to be much better than Sydney's West. In addition, although, the number of Japanese-born population in Sydney is rather small (9,794), their level of concentration is less than its North-East Asian counterparts. The other three groups, Hong Kong, Korea, and China Mainland born populations have similar level of congregation and the location of population centre.

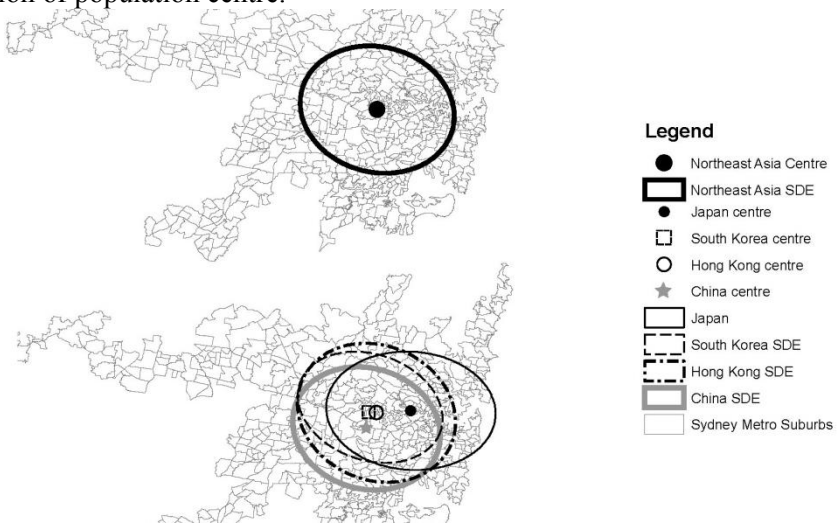

Fig. 5.6. Residential Distribution of the People Born in North-East Asia

The spatial distribution patterns vary greatly for the South-East Asia group. Among the six populations shown in Fig. 5.7, Viet Nam born population is the most congregated in rather undesirable residential areas. Such concentration of Vietnamese people was discussed as early as 1983 by Kelly (Kelly, 1983). According to Burnley (1989) the strong concentration of Vietnamese population was partly because of the recent arrival and partly resulted from the 'gravitation' of migration from outer Sydney area to the existing concentration area. He also identified some spatial association between residential concentration, low occupational status and incomes in the Western Sydney area (Burnley, 1989). The pattern of Vietnamese concentration remains strong nearly 30 years after its first detection.

Although the Philippines-born population has comparatively moderate level of concentration, their residential locations are in the very West of Sydney. This may partly be due to the comparatively recent arrival of this population. Most Filipino migration occurred during the 1980s, peaking in 1987-1988 (Department of Immigration and Citizenship, 2006).

The Singapore and Malaysia born population have the very similar distribution patterns both in the location and the level of congregation. This similarity might have resulted from the popularity of English in the two populations and hence less need of the communal supports from the communities that speak particular languages. The Thailand and Indonesia born groups hold similar population distribution patterns. Compared with those born in Singapore and Malaysia, which are more concentrated to the East, the patterns for Thailand and Indonesia are more dispersed covering broad range from the East to the West. These results lead to suspicion that the cultural traits of migrant communities, the level of success of the mother countries, and the time of arrival in Australia are significant explanatory variables.

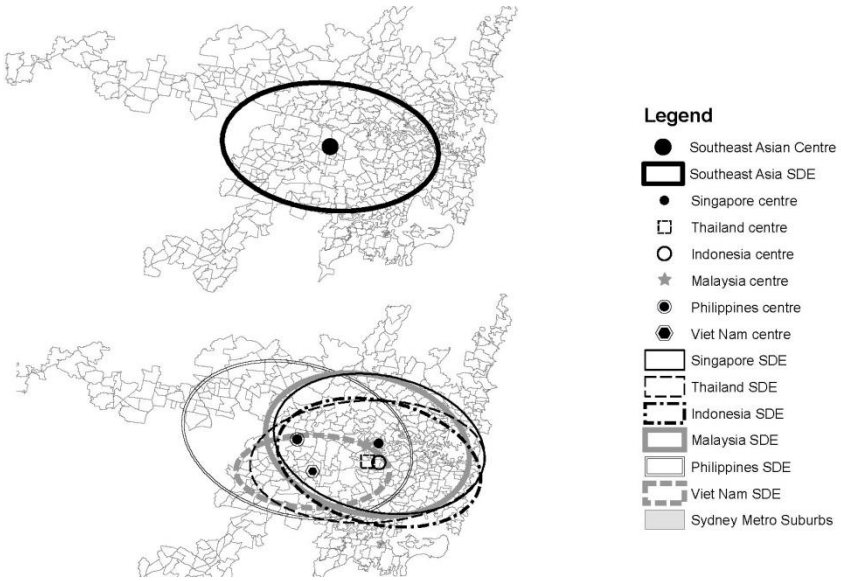

Fig. 5.7. Residential Distribution of the people born in South-East Asia

Compared to other Asian regions, the residential distribution is more dispersed for the population born in the South and Central Asia (Fig.). Both of the two investigated countries, Sri Lanka and India follow a similar concentration area size and congregation centres. The Sri Lanka born population has a rather long immigration history to Australia (Department of Immigration and Citizenship, 2006), which is probably one important reason contributing to the dispersed distribution pattern.

In terms of the spatial distribution for Indian-born population, Monk (1983) studied the behaviour of Indian immigrants in Sydney and concluded that this dispersed distribution pattern is derived from the residential

behaviour and the fact that Indian immigrants were participating socially in the larger Australian society. The effect from the locations of employment such as the universities and medical and research facilities in Randwick and Ryde, played a more significant role compared to the ethnicity congregation factors (Monk, 1983). Burnley (1999) also indicated that the low segregation of the India-born population resulted from longer-resident Anglo-Indians having dispersed into many suburbs and more recent South Asian people in skilled professions settling in the middle-income area.

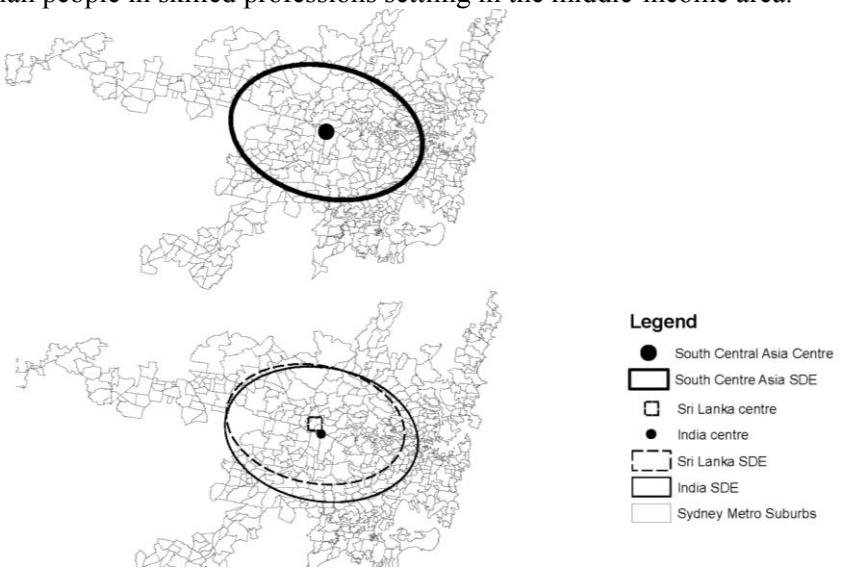

Fig. 5.8 Residential Distribution of the People Born in Southern and Central Asia

The distribution patterns for Oceania are rather different for Fiji than ones for Papua New Guinea and New Zealand (Fig.). The concentrated residential pattern for Fijians may be a result of retaining strong social and economic ties with their relatives in Fiji (Department of Immigration and Citizenship, 2006). Indeed, they do not suffer from poor socioeconomic status when compared with other overseas born groups (the median individual weekly income for the Fiji-born in Australia aged 15 years and over was $562, compared with $431 for all overseas-born), however, they tend to live closer to each other in Sydney's Western areas.

Most of the Papua New Guinea-born people livings in Australia are the children of Australians who were working in Papua New Guinea when Australia was responsible for administering either the Australian territory of Papua or the Territory of Papua and New Guinea (Department of Immigration and Citizenship, 2006). This enables them to contact and

communicate conveniently with Australian society and therefore leads to the dispersed residential pattern.

The New Zealand born population has a rather long immigration history to Australia. This population group also has high income and employment levels (the median individual weekly income for the New Zealand-born in Australia aged 15 years and over was $616, compared with $431 for all overseas-born and the participation rate in the labour force was 76.3 per cent compared with 64.6 to Australian-born population) (Department of Immigration and Citizenship, 2006).

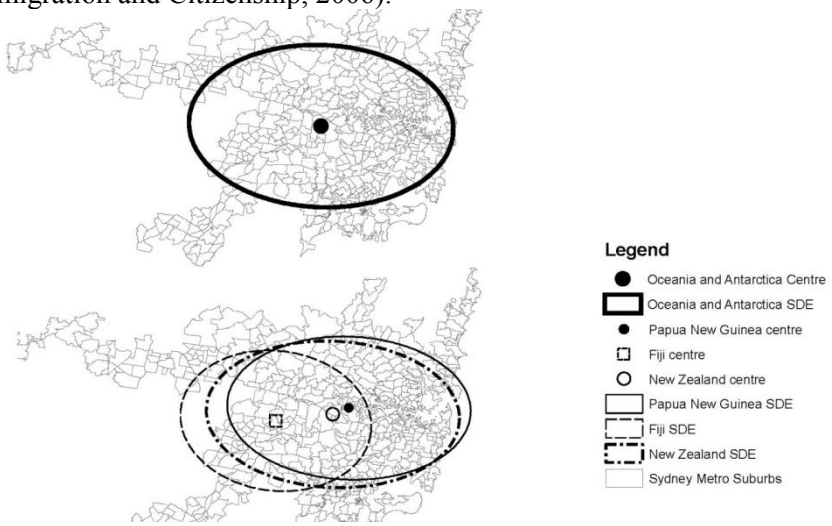

Fig. 5.9 Residential Distribution of the People in Oceania

The residential distributions for the Northwest Europe born are rather dispersed (Figure 5.10). This is because all of these four investigated countries have a long history of immigration to Australia. In addition, these immigrants have rather high socioeconomic status, which enables them the flexibility in choosing wide range of residential locations.

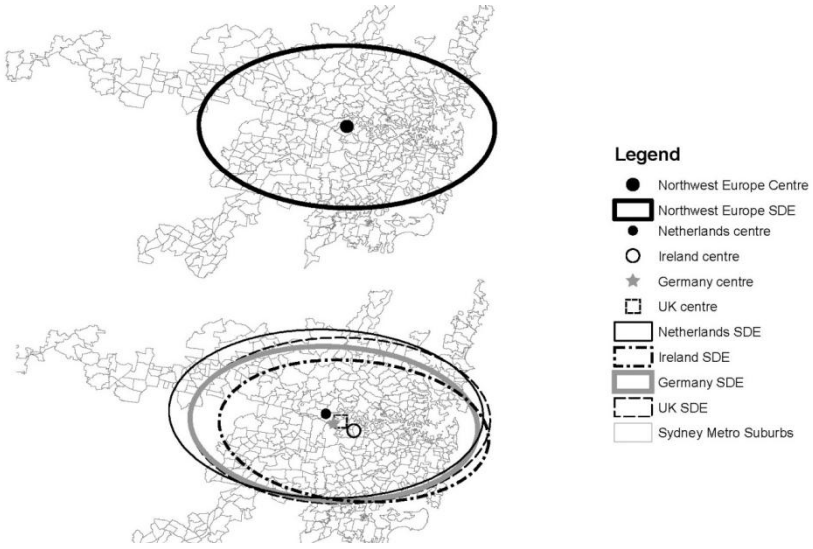

Fig. 5.10. Residential Distribution of the People Born in North-West Europe

In comparison with North-West Europe, there are more differences in the residential distribution pattern of Southern and Eastern Europe (Figure 5.11). But such differences are not as evident as the ones for South-East Asia and none of the investigated countries has revealed a significant congregation pattern.

Three countries, Former Yugoslav Republic of Macedonia, Greece and Malta are identified to be more disadvantaged than others in this group. The Former Yugoslav Republic of Macedonia and Greece born populations live in the residential areas to the South of Sydney and they are more concentrated than others. The Malta born population resides more towards Western Sydney. Burnley's (1975) study on South European immigrants' occupational and residential stratification in both Sydney and Melbourne found that there were higher levels of residential segregation and unskilled labour participation from these three countries when compared with the others. The same trend is still evident 40 years later.

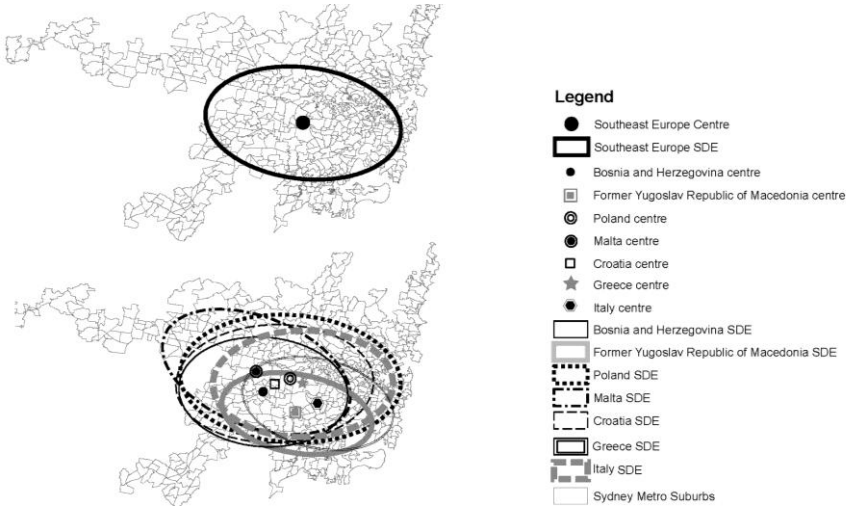

Fig. 5.11. Residential Distribution of the People Born in Southern and Eastern Europe

Figure 5.12 shows consolidated residential distribution for the nine largest groups by birthplace. From this figure it can be seen that broader overseas born population groups are rather centrally located. Their centres are located in five centrally located suburbs that are close to each other.

The large birthplace groups from Northeast Asia, Southeast Asia, the Middle East, show a more concentrated pattern compared to others. This perhaps is a reflection of recent arrivals of these populations. The large scale immigration of these groups took place after 1974 and 1975 after the abandonment of the White Australia Policy.

The population born in Northeast Asia, Sub-Saharan Africa, and Northwest Europe gravitates towards Eastern side of Sydney, people from the USA and Canada, Southeast Europe, and Oceania gravitate towards Central Sydney, and the South Central Asian, Southeast Asian and the Middle East born population gravitate towards Western Sydney. This pattern is partly an outcome of the difference in socioeconomic status of different populations. The difference in housing price and living expenses in different areas is a differentiating factor for these broad population groups.

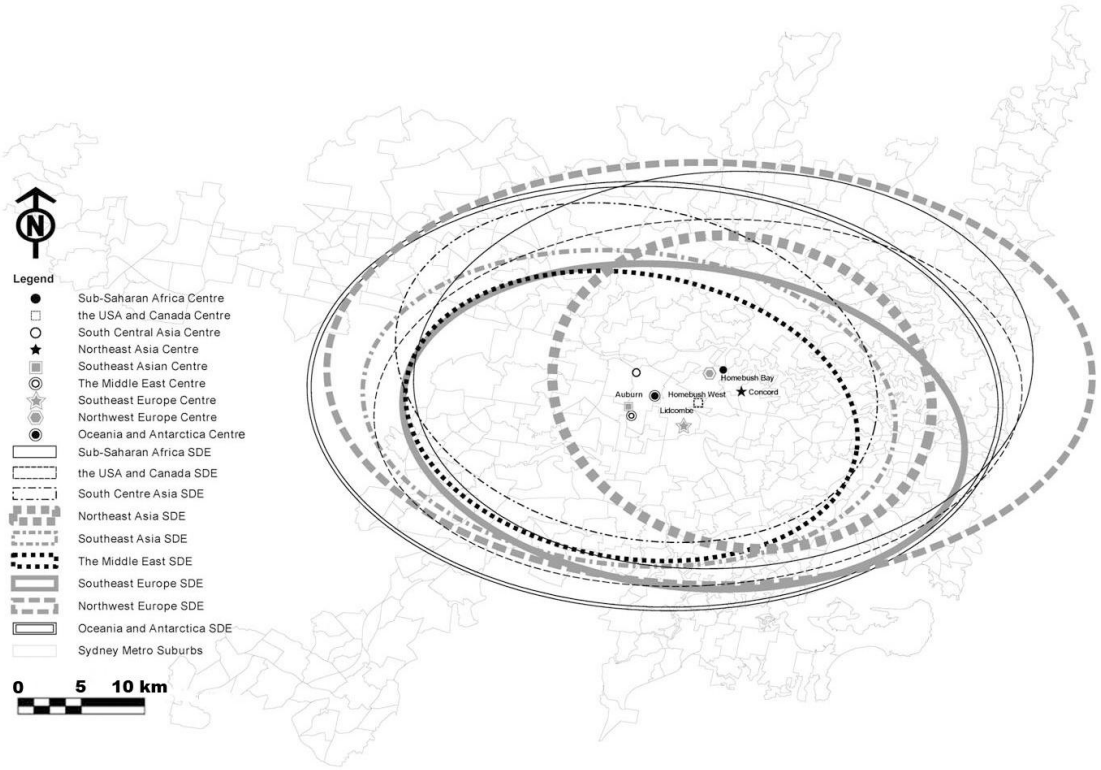

Fig. 5.12. Residential Distribution of Large Birthplace Groups

Figure 5.13 shows the overall ranking for all the 34 investigated countries of birthplace in terms of their concentration level and the location of residential centres. The X coordinates for residential centres and concentration area for each country of birthplace are shown in Tables 5.2 and 5.3. From Figure 5.14, it can be seen that the populations born in Iraq and Viet Nam are most segregated and resides in most undesirable locations in Sydney. Also, the population born in Lebanon, Turkey, Sri Lanka, and Bosnia and Herzegovina reveal some extent of residential concentration in undesirable locations. What should be noticed is that these groups are generally from the Southern and Central Asia and the Middle East large groups.

The populations who born in South Africa, Ireland, Papua New Guinea, USA and Canada are of least concentration and they tend to reside in more desirable locations in Sydney. The successful populations that gravitate towards East and are least concentrated are in general from the large groups of the USA and Canada, Oceania, and Sub-Saharan Africa.

The European-born populations in general have lower level of congregation and they tend to be resident in the moderately desirable locations. The East Asian-born populations who have more congregated distribution patterns also live in rather desirable locations.

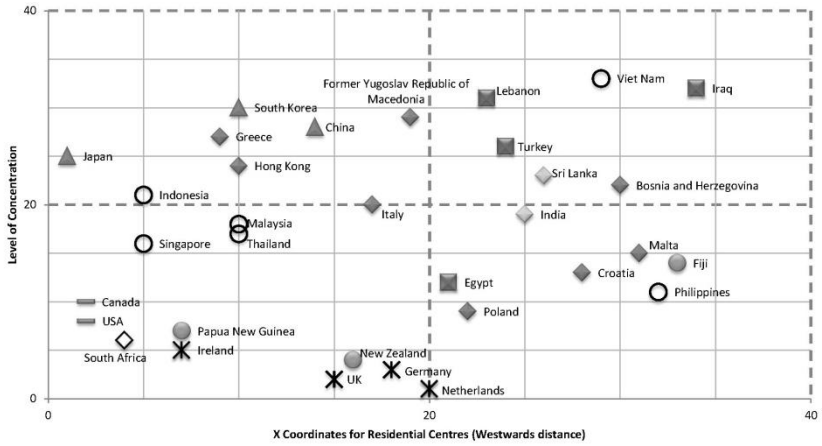

Fig. 5.13 Concentration and Location of Overseas Born Population

Table. 5.2. Congregation of Population Born Overseas

Large Groups	Nations	SDE Size (km^2)	Rank	Popula-tion	SDx (km)	SDy (km)
North-West Europe	Netherlands	1457.887	1	8642	2.90	1.56
North-West Europe	United Kingdom	1372.54	2	148841	2.77	1.54
North-West Europe	Germany	1220.239	3	17232	2.66	1.42
Oceania and Antarc-tica	New Zealand	1058.142	4	74014	2.38	1.38
North-West Europe	Ireland	1046.273	5	12748	2.49	1.30
Sub-Saharan Africa	South Africa	1016.025	6	26927	1.44	2.19
Oceania and Antarc-tica	Papua New Guinea	994.377	7	3296	2.29	1.35
Americas	United States of America	973.047	8	15205	2.28	1.32
Southern and Eastern Europe	Poland	954.407	9	12034	2.27	1.31
Americas	Canada	952.348	10	6850	2.20	1.34
South-East Asia	Philippines	859.754	11	50654	2.03	1.31
North Africa and the Middle East	Egypt	793.452	13	15790	1.97	1.25
Southern and Eastern Europe	Croatia	790.045	14	14712	1.21	2.03
Oceania and Antarc-tica	Fiji	764.785	15	26391	1.80	1.32
Southern and Eastern Europe	Malta	733.979	16	12192	2.03	1.12
South-East Asia	Singapore	724.602	17	8536	1.88	1.20
South-East Asia	Thailand	714.609	18	10501	1.07	2.06
South-East Asia	Malaysia	711.741	19	20655	1.82	1.21
Southern and Central Asia	India	670.592	20	52135	1.74	1.19
Southern and Eastern Europe	Italy	650.145	21	41148	1.09	1.85
South-East Asia	Indonesia	634.307	22	20119	1.82	1.08
Southern and Eastern Europe	Bosnia and Her-zegovina	627.533	23	6232	1.73	1.12
Southern and Central Asia	Sri Lanka	546.578	24	17625	1.61	1.05
North-East Asia	Hong Kong (SAR of China)	541.617	25	36541	1.42	1.18
North-East Asia	Japan	498.604	26	9794	1.49	1.04

North Africa and the Middle East	Turkey	475.116	27	11217	1.73	0.85
Southern and Eastern Europe	Greece	449.975	28	31278	1.56	0.90
North-East Asia	China (excl. SARs and Taiwan Province)	449.427	29	107746	1.32	1.06
Southern and Eastern Europe	Former Yugoslav Republic of Macedonia (FYROM)	403.238	30	11472	1.56	0.80
North-East Asia	Korea, Republic of (South)	391.316	31	31777	1.31	0.93
North Africa and the Middle East	Lebanon	363.471	32	53537	1.29	0.87
North Africa and the Middle East	Iraq	278.787	33	19958	1.27	0.68
South-East Asia	Viet Nam	227.271	35	61848	1.35	0.64

Table. 5.3. Location of Residential Centres of Overseas Born Population

Large Groups	Nations	Residential Centres X Coordinates	Rank
North-East Asia	Japan	151.163	1
Americas	United States of America	151.124	2
Americas	Canada	151.124	3
Sub-Saharan Africa	South Africa	151.115	4
South-East Asia	Singapore	151.109	5
South-East Asia	Indonesia	151.109	5
North-West Europe	Ireland	151.094	7
Oceania and Antarctica	Papua New Guinea	151.094	7
Southern and Eastern Europe	Greece	151.093	9
South-East Asia	Thailand	151.089	10
South-East Asia	Malaysia	151.089	10
North-East Asia	Hong Kong (SAR of China)	151.089	10
North-East Asia	Korea, Republic of (South)	151.089	10
North-East Asia	China (excl. SARs and Taiwan Province)	151.085	14
North-West Europe	United Kingdom	151.069	15
Oceania and Antarctica	New Zealand	151.064	16
Southern and Eastern Europe	Italy	151.062	17
North-West Europe	Germany	151.057	18
Southern and Eastern Europe	Former Yugoslav Republic of Macedonia	151.050	19
North-West Europe	Netherlands	151.043	20
North Africa and the Middle East	Egypt	151.043	20
Southern and Eastern Europe	Poland	151.036	22
North Africa and the Middle East	Lebanon	151.027	23
North Africa and the	Turkey	151.025	24

Middle East			
Southern and Central Asia	India	151.020	25
Southern and Central Asia	Sri Lanka	151.009	26
Southern and Eastern Europe	South Eastern Europe	151.005	27
Southern and Eastern Europe	Croatia	151.005	28
South-East Asia	Viet Nam	150.993	29
Southern and Eastern Europe	Bosnia and Herzegovina	150.981	30
Southern and Eastern Europe	Malta	150.967	31
South-East Asia	Philippines	150.966	32
Oceania and Antarctica	Fiji	150.957	33
North Africa and the Middle East	Iraq	150.943	34

6. Main findings and conclusions

After investigating the spatial distribution pattern of each group from different countries of birthplace, this research has painted a general picture of ethnicity distribution and the level of congregation in Sydney. The major findings of the study are as following:

- The centrographic method is capable of providing more information on the congregation situation for each ethnic community than the ID or IS methods. It is an appropriate method for describing the features of ethnicity concentration, since it shows the locations and the spatial scale of the absolute congregation occurrence. This information enables further exploration of the reasons to such patterns, such as the social-economical levels for the locations, the education levels, or the distance to city centres and other service facilities.
- In general, the non-Australian born populations gravitate to Western and Southern Sydney. However, there were no groups that could be regarded as very highly segregated in Sydney. Indeed, comparatively strong residential concentrations for some groups

such as Iraq born population, Viet Nam born population occur in areas in Sydney western areas. However, these concentrations are still not comparable with the high level of concentration of African-Americans and Hispanic-American exhibit in many cities in the USA. Therefore, one can conclude ethnic 'ghettoes' are non- existent in Sydney.

- For the large ethnic groups, the Asian and the Middle Eastern tend to be more concentrated than European populations. In particular, Southern and Southeast Asians reside more congregated and they live more in the Western Sydney areas. In contrast, the North European populations are the least congregated. Three variables may play roles here:
- There are rather strong distinctions in the level of concentration and their spatial distribution between different cultural backgrounds. The reasons of such tendencies need to be further explored. Closely associated with culture are other traits such as level of success of the mother countries and the attributes/type/strata/motivations of the population that migrates.
- Influence of being a large group: It is usually assumed that larger immigration populations tend to be more concentrated as the large consumption can support local services and in turn encourages concentration. This hypothesis is somewhat validated by evidence of high level of concentration of six out of seven largest language groups. The relative time of immigration in history: This factor is a frequent topic of discussion when analysing the factors that influence the level of ethnic concentration. As Europeans have a longer history of immigration, they tend to be more confident and not likely to be restricted when choosing residential locations. In contrast, as the Asian and the Middle East populations are relatively recent migrants, they tend to prefer to live in places where they can easily get access to people with the same cultural background.

7. References

Australian Bureau of Statistics. (2006). CENSUS 2006 - PEOPLE BORN IN THE MIDDLE EAST. Canberra: Australian Bureau of Statistics.

BashiI.Vilna, & HughesAlanMark. (1997). Globalization and Residential Segregation by Race. The ANNALS of the American Academy of Political and Social Science, 105-120.

BaumScott. (1997). Sydney, Australia: A global city? Testing the social polarisation thesis. Urban Studies, 1881-1901.

Berry, J. W., & Laponce, L. A. (1994). Ethnicity and Culture in Canada. In *The Research Landscape.* Toronto: University of Toronto Press.

BurnleyIan. (1975). Ethnic Factors in Social Segregation and Residential Stratification in Australia's Large Cities. the Australian and New Zealand Journal of Sociology, 12-20.

BurnleyIan. (1999). Levels of Immigrant Residential Concentration in Sydney and their Relationship with Desadvantage. Urban Studies, 1295-1315.

BurnleyIan. (1989). Settlement Dimensions of the Vietnam-Born Population in Metropolitan Sydeny. Australian Geographical Studies, 129-154.

CastellM. (1989). The Informational City: Information Technology, Economic Restructuring and the Urban-regional Process. Oxford: Blackwell.

Department of Immigration and Citizenship. (2006). Community Information Summary. Department of Immigration and Citizenship.

Deurloo, M. C., & Musterd, M. (1998, Vol. 35, No. 3). Ethnic Clusters in Amsterdam, 1994- 96:Ethnic Clusters in Amsterdam, 1994± 96:. *Urban Studies* , pp. 385- 396.

DunnM.Kevin. (1998). Rethinking Ethinic Concentration: the Case of Cabramatta, Sydney. Urban Studies, 503-527.

FaheyTony, & FanningBryan. (2010). Immigration and SOcio-spatial Segregation in Dublin, 1996-2006. Urban Studies, 1625-1642.

Green, R. P., & Pick, J. B. (2006). Race, Ethnicity, Gender, and Poverty. In *Exploring the Urban Community a GIS Approach* (p. 204). Upper Saddle River: Pearson Education.

HamnettChris. (1994). Social Polarisation in Global Cities: Theory and Evidence. Urban Studies, 401-424.

HealyE. (1996). Welfare benefits and residential concentrations amongst recently-arrived migrant communities. People and Place, 20-32.

JohnstonRon, ForrestJames, & PoulsenMichael. (2001). Sydney's Ethnic Geography: New Approaches to Analysing Pattern of Residential Concentration. Australian Geographer, 149-162.

JohnstonRon, ForrestJames, & PoulsenMichael. (2001). The Geography of an EthniCity: Residential Segregation of Birthplace and Language Groups in Sydney, 1996. Housing Studies, 569-594.

KellyP. (1983). Vietnamese settlement in Sydney. Sydney: Advisory Council for Inter-Government Relations.

Knox, P., & Pinch, S. (2010). Segregation and Congregation. In *Urban Social Geography* (p. 167). Malaysia: Pearson Education Limited.

MaseyS.Douglas, & DentonA.Nancy. (1988). The Dimension of Residential Segregation. Social Forces, 281-315.

MasseyD.S., & DentonN.A. (1993). American Apartheid: Segregation and the Making of the Underclass. Cambridge, MA: Harvard University Press.

MonkJanice. (1983). Asian Professionals as Immigrants: the Indians in Sydney. Journal of Cultural Geography, 1-16.

MorrillL.R. (1991). On the measure of geographical segregation. Geography Research Forum, 25-36.

PamukAyse. (2004). Geography of Immigrant Clusters in Global Cities: A Case Study of San Francisco, 2000. International Journal of Urban and Regional Research, 287-307.

Peach, C. (1975). *Urban Socail Segregation.* London: Longman.

Racine, J.-B. (2002). Migration, Places and Intercultural Relations in Cities. In I. Schnell, & W. Ostendorf, *Studies in Segregation and Desegregation* (p. 67). Burlington: Ashgate Publishing Limited.

Rhein, C. (1998, Vol. 35, No. 3). Globalisation, Social Change and Minorities in Metropolitan Paris: The Emergence of New Class Patterns. *Urban Studies* , pp. 429- 447.

SassenSaskia. (2003). Globalization or denationalization? Review of International Plolitical Econom, 1-22.

WongW.S.David. (1999). Several Fundamentals in Implementing Spatial Statixtics in GIS: Using Centrographic Measures as Examples. Geographic Information Sciences, 163-174.