THE RESIDENTIAL PATTERNS OF EUROPEAN ETHNIC GROUPS IN U.S.
CITIES: CASE STUDIES IN PITTSBURGH AND CLEVELAND, 1940 AND 2000

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CHAPTER I
INTRODUCTION

Background

During the late 19th and early 20th centuries, the United States attracted a massive influx of European immigrants. Beginning in the 1840s, crop failure and resulting famine in Western Europe led to the widespread immigration of German, Irish, and other Western European populations to America (Ward, 1971). Although immigration from this particular region declined significantly later in the century, Southern and Eastern Europeans began arriving in the late 1870s and many of these individuals were associated with larger village or regional chain migration patterns. It is estimated that in the years between 1900 and 1910 roughly eight million immigrants entered the U.S., with nearly six million of those coming from Italy and the various Austro-Hungarian nations (Ward, 1971).

Two of the foremost industrial centers in the United States at the turn of the century, Pittsburgh and Cleveland, attracted many new immigrants because of readily available employment opportunities in the iron and steel industries. These immigrants included Italians, Poles, and Slovaks as well as African-Americans from the South, most of which found unskilled labor positions in the steel industry. Such employment was
available due to technological advancements in mass production (Klein, 1938) as well as the need to counter labor strikes (Schreuder, 1989). The rapidly expanding steel enterprise required large labor forces willing to work long hours for modest wages with little or no job security.

The settlement patterns of these new immigrant groups in the two areas were far from random. Upon arrival and for several subsequent years—or longer—working class immigrants lived alongside other immigrants—of any number of different nationalities—in crowded tenement buildings located throughout inner-city districts. There was little choice in the matter of residence, as the tenement apartment was all that could be rented with a laborer’s meager wages.

However, after acquiring enough wealth and being joined by family members and relatives who could not accompany the workers on their initial voyages to America, ethnic groups began establishing residential “enclaves,” or ethnic neighborhoods. A shared characteristic of these neighborhoods, regardless of the particular ethnic group that inhabited the residential cluster, is that they were usually located in close proximity to the industrial districts or facilities in which the immigrant workers were employed (Bodnar, 1982; Schreuder, 1989; Ward, 1989). Ethnic enclaves appeared not only in large, central cities, but also in any outlying cities or towns home to industrial enterprises requiring large, cheap labor forces—such as Homestead (Byington, 1910), McKeesport (Klein, 1938), and other peripheral cities of the Pittsburgh metropolitan area.

The same processes of neighborhood ethnic identification and social networking occurred in these cities among African-Americans, with the largest early migration of southern blacks to northern cities occurring around 1915 (Ward, 1971). Many of the
German, Irish, and Scottish immigrants who settled in Pennsylvania and Ohio in previous decades had already begun to assimilate with and live among many native-born residents. Because of the spatial restraints imposed by employment location and the lack of transportation, as well as other economic factors, most districts were home to members of more than one specific ethnic group, not uncommonly representing three or four different nationalities (Conzen, 1979). However, ethnic groups usually did not occupy areas in equal proportions, therefore groups tended to cluster in certain neighborhoods or districts. Such neighborhoods were not only in close proximity to major centers of employment, but were also usually within walking distance of a national church, fraternal lodge, or other immigrant-established social institution. Even today patterns are evident in the residential distribution of county residents who identify with specific ancestry groups. Such patterns exist as the remnants of early ethnic enclaves.

The purpose of this study is to examine both historic and contemporary residential patterns of European ancestry groups in cities of the United States to determine if the same groups in different areas exhibit shared patterns. Specifically, Pittsburgh and Cleveland are used as case studies for comparison (Figure 1.1). Both metropolitan areas were the destinations of foreign-born immigrants arriving in the U.S. between 1840 and 1920, including Germans, Irish, and numerous Southern and Eastern Europeans (Ward, 1987).
Figure 1.1 – Allegheny County, Pennsylvania and Cuyahoga County, Ohio
Problem Statement

This study attempts to answer the following two questions: (1) Did immigrant groups from the same country of origin living in different U.S. cities exhibit shared settlement patterns? (2) Did the changes of group residential distributions from 1940 to 2000 also follow shared patterns? The hypothesis is that the initial settlement patterns of the same ethnic group were quite similar in different cities but that the changes in residential distribution were unique to each city. These changes can be attributed to the social, economic, and even physical characteristics of each metropolitan area.

Additionally, the contemporary patterns may be significant for some groups but not for others, based on the varying response to housing trends and economic change as well as differences in social mobility (Barton, 1975). For both Pittsburgh and Cleveland, the ethnic composition of census tracts is likely to follow patterns that reflect the historic locations of ethnic enclaves. According to Conzen (1979), ancestral or ethnic affiliation may have played a major role in determining present residential patterns. By calculating the appropriate statistical indices of residential segregation, interpreting the results in a logical manner, and explaining any significant findings in terms of real-world phenomena, this study will ultimately examine the ability of ethnic enclaves to survive into the 21st century.
Overview of the Methodology

Due to the similarities between the multicultural compositions of Pittsburgh and Cleveland as well as overall population sizes, 1.28 and 1.39 million, respectively (Census 2000), a comparison of residential distribution in these two cities may differentiate between characteristics that are specific to an ethnic group as well as those specific to the city in which it resides. As such, this study entails the comparison of residential patterns in Allegheny County to those in Cuyahoga County to identify important similarities and differences. Significant ethnic populations also exist in smaller cities and municipalities of the two metropolitan areas, especially Pittsburgh. As a result, analysis is conducted at the county level, which includes central cities as well as adjacent urban and suburban areas (see Fig. 1.1).

A wide variety of data for both Allegheny County, Pennsylvania (Pittsburgh) and Cuyahoga County, Ohio (Cleveland) are available, including decennial census tabulations as well as numerous historic studies. A combination of quantitative mapping and statistical procedures are employed to analyze the residential patterns of ethnic groups in 1940 and 2000 and take note of major distinctions. However, it should be made clear that the identification or examination of specific changes in spatial distributions occurring between 1940 and 2000 is not within the scope of this study. The two years were selected simply to determine if and to what extent ethnic groups exhibited residential patterns in the past and if any of those patterns still exist today.

Sufficient statistical data to evaluate my hypothesis are available in the decennial census reports released from 1940 through 2000, including data on country of origin for
foreign-born populations in the censuses before 1980 and reported ancestry from 1980 to 2000. Statistical measures are used extensively to analyze census data and quantify various aspects of residential segregation, including four specific “dimensions” of segregation (Massey and Denton, 1988): population unevenness throughout the study area; exposure to other ethnic groups; population concentration within specific areal units; and the clustering of group members in adjacent units. The residential patterns of the six groups are analyzed in each study area independently, followed by an examination of changes in residential distribution for each area, and finally a comparison of the two areas to evaluate similarities and differences among the same groups in different geographic locations.

While spatial analysis does play a significant role in the process of analyzing ethnic residential patterns, so does an understanding of the unique cultural landscapes, histories, and changing economies of Pittsburgh and Cleveland. An analysis of spatial distribution is meaningless without an acknowledgement of the various social and economic factors that influence settlement decisions and determine lifestyle choices. With the proper data and software anybody can support a claim that residential patterns exist. Regarding residential segregation, Hoong Sin (2002) states that using objective statistics alone to evaluate such a complex social process is insufficient. For such evaluation a researcher must possess a working knowledge of the many unique factors involved in a specific scenario. This study attempts to go beyond such simple description and instead provide a discussion of why such patterns may exist, utilizing historic accounts of immigration to and settlement in both Pittsburgh and Cleveland.
Significance of This Study

Through an analysis of historic ethnic enclaves and the changes occurring throughout the past several decades, this study shows how the social and physical environments of U.S. cities helped foster new, uniquely “American” identities for immigrant groups. On the other hand, the results of this study may indicate the continued existence of a cultural heritage able to resist the social mechanisms that lead to structural assimilation. This indication in turn could serve as evidence of the shared characteristics of individual ethnic groups across different U.S. cities. Most importantly, this study promotes the research that is necessary to gain a better understanding of the spatial characteristics of human migration, settlement, and assimilation.

This study focuses on six European ancestry groups living in two major U.S. metropolitan areas, offering a broad comparative approach to assessing residential patterns of ethnicity. Although many scholars have examined the individual immigrant and ethnic groups of Pittsburgh and Cleveland (Barton, 1975; Bodnar, 1982; Byington, 1910; Fordyce, 1933; Grabowski, 1976; Papp, 1981; Pankuch, 2001), usually in a cultural or historic context, very few have examined the complex spatial relationships between these groups. Fewer yet have attempted to assess any relationships that may or may not exist between the American-born descendants of European immigrants who settled in Pittsburgh and Cleveland.

Johnston (2003) remarks at the lack of research on variation in the segregation of different ethnic groups in specific urban areas as well as the comparative analysis of different urban areas. Additionally, most of the recent studies of race and ethnicity have
focused on easily identifiable groups with unique physical or linguistic characteristics, such as African-Americans, Asians, and Hispanic peoples that co-reside in major U.S. metropolitan areas—especially New York (Poulsen, et al, 2002) and Los Angeles (Clark, 1992; Allen and Turner, 1996; Logan, 2002; Ellis, et al, 2004).

Finally, recent advancements in GIS technology offer new methods of analyzing racial and ethnic residential patterns. Massive amounts of spatial data can be efficiently analyzed within the framework of a GIS platform using customized code written in any number of programming or scripting languages. GIS technology adds an unprecedented amount of precision to the study of group residential patterns—making it possible to draw conclusions that involve more than merely the presence or absence of segregation. For these reasons, all tabular data is stored and edited in a GIS format (linked to a geographically referenced display of census tract boundaries) and calculations are made using existing and customized tools within the framework of the GIS.
CHAPTER II
LITERATURE REVIEW

Immigration, Settlement, and the Role of Industrialization

Since the beginning of the 20th century researchers have studied the history of immigration to the United States, especially the periods of large-scale European migration to urban areas that began in the 1840s. Many of the earlier studies (Byington, 1910; Fordyce, 1933; Klein, 1938) were in a historic context, characterized by detailed descriptions of migration, settlement, and the formation of ethnic neighborhoods and institutions, including fraternal lodges and churches. Research from the early decades of the 20th century rarely dealt with specific topics, focusing instead on a wide variety of issues related to immigration and immigrant life. Because of this general characteristic, the usefulness of many historic sources is limited in regard to this study.

However, older literature can provide useful information regarding the locations of ethnic enclaves and immigrant establishments (Fordyce, 1933), which helps to verify patterns that may be evident in the mapping of census data. Also, studies from the first few decades of the 20th century shed light on some of the social factors involved in large-scale migration, including the ethnic division of labor that existed in the large iron and steel industries of Pittsburgh and Cleveland (Ward, 1989). An example is Byington’s (1910) study of Homestead, Pennsylvania.
Byington discusses all major groups that settled in Homestead seeking employment, including four broad “racial” categories: native whites; English-speaking European immigrants; Slavic immigrants; and African-Americans, known in 1910 as “colored” people (Byington, 1910). According to Byington, the greatest social division in Homestead at the time was that between the Slavs and the native-born whites—even greater than the division between whites and African-Americans. Byington’s description of one of Homestead’s working-class residential areas offers a glimpse into the living conditions of immigrants, which can help to understand the social and cultural aspects of early ethnic enclaves.

Published almost twenty years after Byington’s research, Klein’s (1938) social survey covers various aspects of the metropolitan area’s socioeconomic structure. In a chapter devoted to the social stratification among various ethnic and racial groups and native-born whites, Klein maintained that in any area in which several families of the same nationality reside, an ethnic community is likely to develop. Social institutions were often the most important and influential aspects of immigrant communities; Klein cites the significance of the national church for several groups, including Greeks, Poles, Russians, and Slovaks.

Klein also discusses several specific ethnic neighborhoods and institutions located in the city of McKeesport. One of Klein’s most important observations is that the majority of McKeesport’s ethnic enclaves were located along the river valleys at lower elevations than the higher-class neighborhoods on the hilltops and ridges. Interestingly, in a recent study of residential patterns in Worcester, Massachusetts in 1891, Meyer (2005) found the opposite to be true, with lower-class residents living at higher elevations
due to the relative difficulty (and cost) in accessing such areas—what he collectively
refers to as the “vertical urban fringe” (Meyer, 2005). More significant in relation to this
study, however, is the fact that Meyer acknowledges the influence of the physical
geography on patterns of residence: “…the results offer further evidence of the need to
consider the environmental dimensions of cities in order to understand their human
geography” (Meyer, 2005: 785). Certainly, the different topographies of Pittsburgh and
Cleveland must be considered in a comparative study of residential patterns in the two
cities. According to Bodnar (1982), the topography of Pittsburgh helped protect ethnic
enclaves from the encroachment of outside populations and consequently prolong their
survival (Bodnar, 1982: 231).

Recent work by Muller and Tarr (2003) on the “interaction of natural and built
environments” in the Pittsburgh area explains how the physical characteristics of
Pittsburgh as well as its location in relation to the larger regional economy promoted
industrial growth in the metropolitan area. Rocky and sandy soils limited the
development of agriculture in the area near the convergence of the Allegheny and
Monongahela rivers, while local iron ore and coal deposits allowed for rapid engagement
in the iron industry (Muller and Tarr, 2003). This industry was confined to the central
city until the 1870s, when it spread along the riverbanks into peripheral cities. Due to the
area’s hilly topography, urban development did not follow “the typical gridiron street
pattern” (Muller and Tarr, 2003: 24) as in most cities. The different physical and
environmental characteristics of Pittsburgh and Cleveland certainly resulted in different
residential patterns.
Location-specific studies of immigration and immigrant settlement have been conducted for both Pittsburgh and Cleveland, with many focusing on the role of immigration in the initial corporate industrialization of the United States. Couvares’ (1984) work serves as an excellent introduction to the history of Pittsburgh, with an emphasis on industrial growth—beginning with glass manufacturing in the 1830s (Muller and Tarr, 2003) and later the iron and steel industries in the 1860s. The steel industry became characterized by the mechanization of processes and the increased reliance on an unskilled, inexpensive labor force—which became readily available when southern and eastern Europeans and African-Americans from the southern United States began migrating to the large manufacturing cities of the North Atlantic and Midwest.

Couvares (1984) describes the social stratification that existed in Pittsburgh as a result of the large wave of immigration that arrived in the U.S. between 1890 to 1920. The “new immigrants” replaced many of the German, Irish, and Welsh “old immigrants” who previously worked in skilled trades in the mills (Couvares, 1984), largely because the new immigrants were willing to work for far lower wages. Differences between social classes became more sharply defined in economic terms as well as in the division of the community. Couvares states: “Pittsburgh became a city of more rigidly segregated ethnic enclaves” (Couvares, 1984: 89).

Bodnar (1982) provides an analysis of Pittsburgh’s ethnic composition during the early 20th century, including new immigrant groups as well as African-Americans. In particular he examines the immigration, employment, and residence patterns of African-Americans, Italians, and Poles in Pittsburgh from 1900 to 1960. Bodnar discusses the symbiotic relationship between immigration and industrialization, reinforcing the claim
that the demand for unskilled labor was a major factor in the growth of immigration. He states: “Mechanization within the industry also affected the demand for unskilled labor” (Bodnar, 1982: 16).

The almost continual availability of unskilled labor positions during the period of industrial expansion motivated Southern and Eastern Europeans and blacks to migrate to Pittsburgh. According to Bodnar, Poles and Italians outnumbered all other foreign-born city residents in 1930 (Bodnar, 1982). The arrival of the new immigrants had a profound impact on the residential patterns of Pittsburgh’s existing old immigrant population. In Bodnar’s words: “Middle-class neighborhoods also began to develop as early German, Irish, and English residents left the core in the 1880s and 1890s” (Bodnar, 1982: 23); such neighborhoods were commonly known as “streetcar suburbs.”

Similar literature exists on the Cleveland area. A useful study of the early immigrant groups that settled in Cleveland is Barton’s Peasants and Strangers (1975), which describes many social aspects characteristic of the city’s Italians, Romanians, and Slovaks. Many of the topics Barton discusses, including group intermarriage, religious similarities and differences, and occupational trends, remain important issues in research on America’s numerous immigrant communities (Peach, 1980, 1996; Ellis et al, 2004). Pankuch (2001) is another useful source offering information on the history of Cleveland’s immigrant groups. Although Pankuch’s work is largely based on the historic social organization of Cleveland’s Slovak community, it describes the specific locations of Slovak national churches located throughout Cleveland and Lakewood.

Although many of the older sources on immigrant settlement contain mostly descriptive observations and historic accounts, some contain detailed information that can
help explain patterns evident in census data on immigration. Such material allows for a more accurate comparative approach to studying European immigration, settlement, and assimilation—the opportunity to compare historic patterns and processes in Pittsburgh to those in Cleveland.

Social Effects of Large-Scale Immigration

The majority of the studies that have been conducted in the latter half of the 20th century are less concerned with providing historical accounts of immigration and more with examining the social aspects of the immigrant experience, including the role of the ethnic neighborhood in the process of assimilation. In the second half of the 20th century, sociologists began examining the social mechanisms involved in ethnic “enclavization” or residential isolation. The geography of immigrant settlement became a major focus of the University of Chicago sociologists, led by Robert Park, who anticipated (and in some ways predicted) a strong positive relationship between socioeconomic advancement and structural assimilation in the form of population dispersion from inner-city ethnic enclaves (Kantrowitz, 1981). Robert Park was confident enough in this ideology of rapid social mobility to openly challenge the “scientific racists” who advocated the anti-immigration legislation of the 1920s (Ellis, 2004; Schreuder, 1989).

On the other hand, studies have claimed that Robert Park’s ideological legacy adversely affected much of the policy making until at least the 1970s regarding segregation. According to Kantrowitz (1981), Park and his followers viewed the rapid
assimilation of immigrants into American society and their adherence to the dominant Anglo-Saxon-American culture as the only logical form of progress for those peoples. The social Darwinist rhetoric was accepted as the standard theory of residential segregation and has had a longstanding legacy. Assimilation was considered progress and cultural (or residential) isolation was seen as justification for minority status relative to the native-born population.

As a result of the social Darwinist and environmentalist perceptions of segregation, it became a widely accepted belief that ethnic segregation did not exist in America. Many used the idea of European ethnic progress to support the idea that minority populations will eventually (and without the intervention of policymakers) overcome segregation and other social problems. Kantrowitz (1981) feels that the academic community has the responsibility of empirically assessing the issue of ethnic segregation “at all class levels, generations and into suburbia” but has made little effort to do so (Kantrowitz, 1981).

Other informative studies of the immigration/urbanization process include those of Ward (1971, 1989), whose work largely focuses on the role of immigration in the growth of American cities as well as the socioeconomic implications of urban immigrant settlement. Ward (1989) discusses both the early period of immigration, from 1840 to 1880, in which German, Irish, and Anglo-Saxon peoples came to the U.S. as well as later period, from 1880 to 1920, in which Southern and Eastern European groups arrived. Ward begins by redefining the “slum” and the “ghetto” relative to their respective roles in the immigrant experience. He argues that such areas were rarely as underdeveloped and impoverished as many earlier scholars—especially Oscar Handlin—have claimed, and
immigrant neighborhood greatly assisted immigrants in coping with the difficulties of adapting to American society. In later chapters Ward discusses the “ethnic division of labor” that became prevalent in American industries near the turn of the century.

According to Ward:

The new ethnic division of labor was most clearly developed in the highly integrated large-scale production of steel. The huge plants, concentrated in Pennsylvania and Ohio but with major outliers on Lake Michigan, employed Slavic immigrants from Eastern Europe… (Ward, 1989: 208).

Ward states that these Slavic immigrants, in addition to African-Americans, were the primary labor force for the new industrial enterprise. The social organization of the lower-class, unskilled and semi-skilled workers led to the “establishment of complex, discrete residential patterns” (Ward, 1989: 212) that were themselves embedded in large-scale migration patterns that followed regional economic growth.

Schreuder (1989) stresses the need to analyze the close relationship between labor segmentation and residential patterns when studying the ethnic communities of the early 20th century. She examines the increased reliance on unskilled and semi-skilled workforces as an important characteristic of the new “monopoly capitalism” (Schreuder, 1989: 123), which led to labor segmentation in America’s industrial cities. She contends that labor segmentation was heavily influential in the development of working class ethnic communities in the early 1900s. Outside of the southern and eastern European ethnic communities, native-born residents as well as old immigrants saw the newcomers as a threat to job security. According to Schreuder, it was this fear that led to the Immigration Restriction Act of 1924, drastically slowing the arrival of immigrants.
Conzen (1979) addresses many important issues in the study of immigration and ethnicity. She begins by reviewing the early work on the subject, with special attention on the leading sociologists of the era, such as Robert Park, Ernest Burgess, and Oscar Handlin. She explains that the popular view among scholars held that the immigrant neighborhood was a natural route to socioeconomic assimilation. This hypothesis maintained that the ethnic enclaves clustered around a given city’s central business district in what was deemed the “zone of transition” (Conzen, 1979: 603) served to shelter immigrants from the alien society surrounding them, thus allowing assimilation to proceed at a more comfortable rate. Conzen believes that the “ghetto model”, advocated by the pioneer urban ecologists, is not applicable to all groups because of the variety of unique social and economic factors in any specific situation.

In her study, Conzen attempts to answer the question: “Why did residential concentration occur within some groups, cities, and time periods, and not others” (Conzen, 1979: 608)? For this she conducts an analysis of German immigrant settlement in cities across the United States and finds a great deal of variation among study areas. The analysis revealed significant variation in segregation indices, ranging from .25 to 0.5 (on a scale from 0 to 1)—generally lower than indices calculated for racial minority groups and new immigrants but higher than those for other old immigrants. This phenomenon can be attributed to what Peach refers to as the “hierarchy of acceptance” (Peach, 1996: 138), or the relatively rapid assimilation of old immigrants prior to and during the arrival of southern and eastern Europeans.

Among the twenty cities in Conzen’s (1979) study with the largest German populations in 1910, residential patterns appear to have been less concentrated in older
eastern cities and more concentrated in cities such as Detroit, St. Louis, and Milwaukee. Conzen explains this discrepancy with regional differences in housing markets and employment patterns. Conzen believes that there is not always a clear relationship between residential patterns, assimilation, and cultural heritage but that the possible role of immigrant neighborhood cannot be ignored.

Statistical Measures of Segregation

Within the past few decades increased interest in the spatial aspects of segregation has led to the employment of statistical measures in the analysis of residential patterns. Massey and Denton (1988) provide a thorough explanation of the various aspects of residential segregation. The authors present five different factors that need to be considered when examining the spatial distribution of populations. These five “dimensions” of segregation include: unevenness, exposure, concentration, centralization, and clustering (Massey and Denton, 1988).

The first of these dimensions, unevenness, represents the difference between areal unit populations belonging to one group—usually a specific race or ethnicity—throughout a given study area. To illustrate the measurement of unevenness, consider the following example: a group that resides entirely within one tract of a county can be said to show the highest possible level of unevenness, whereas a group scattered throughout all the tracts of a county will exhibit the lowest level. Exposure describes the degree to which a group resides alongside one or more other groups in the same areal units. Concentration represents the likelihood of a high proportion of a population residing in a
limited area or group of areal units. African-Americans living in large urban areas have historically shown high levels of concentration. Finally, clustering is the aspect that assesses the extent to which large populations reside in adjacent areal units. If an ethnic group lives primarily in one or two areas that consist of several adjacent census tracts it is likely to show a high level of clustering; the adjacent tracts represent a “cluster” of high group population counts. Additionally, a group of adjacent areal units that contain unusually low population counts relative to other areas is said to show “negative clustering.”

Clustering is unique among the various dimensions of segregation in that it is largely based on the spatial aspects of residential patterns. Such aspects are not taken into account by traditional structural measures, including the often-criticized index of dissimilarity (Wong, 1993; 1998; 1999; 2005). However, the spatial arrangement of areal units that contain a given population is a key element of clustering (Figure 2.3).

![Figure 2.1 – Dissimilarity versus clustering](image)

Each gray block contains 1/4 of the total population of group X and no members of group Y. Each white block contains 1/12 of the total population of group Y and no members of group X. Areas A and B produce identical values of dissimilarity (1). However, group X does not show clustering in Area A but does, in fact, show clustering in Area B. The four central blocks comprise the population cluster of group X.
After explaining the different aspects of residential segregation, Massey and Denton (1988) employ methods of inter-correlation and factor analysis to evaluate and compare a variety of statistical indices. Using their findings, they recommend a specific measure for each dimension of segregation. Their recommendations, which they propose be used in future research, include the index of dissimilarity (ID) for assessing unevenness. Arguably the most common measure of segregation, ID is a statistical measurement of unevenness, which compares the distributions of two mutually exclusive population groups residing within the same areal units. Duncan and Duncan (1955) are given credit for the development of this index, which is written as:

\[
ID = \frac{1}{2} \sum_{i=1}^{n} \left( \frac{x_i}{X} - \frac{y_i}{Y} \right)
\]

In the formula above, “x”, equals the population of group “x” in areal unit “i,” “X” equals the total population of group “x” in all areal units combined, and likewise for group “y,” and “Y” (U.S. Census Bureau, 2004). The ID determines the proportion of individuals in one group that would have to move into other areal units to balance the distribution of the two groups. The resulting index, as with the majority of other indices of segregation, is a number between 0 and 1, 0 being indicative of absolutely no dissimilarity (i.e. - a fully mixed population) and 1 indicating maximum dissimilarity (i.e. - fully segregated population).

In addition to ID, Massey and Denton (1988) recommend using both the isolation index and the interaction index (\(xP^*x\) and \(xP^*y\), respectively) for exposure; the relative concentration index for concentration; the absolute centralization index for centralization; and, finally, the spatial proximity index for clustering. Iceland (2002) took the approach...
advocated by Massey and Denton (1988) to analyze changes in the residential segregation of four major racial/ethnic groups in U.S. metropolitan statistical areas between 1980 and 2000. However, he first performed an independent evaluation of segregation indices and made his own selections. Iceland (2002) came to the same conclusions as Massey and Denton, with the exception of the index used for assessing concentration, for which he chose delta instead of RCO.

Sakoda (1981) was one of the first to propose a “generalized index of dissimilarity” ($D_g$), which allows for an overall comparison of several groups that reside in a study area. His formulation produces not only individual indices for the groups in the calculation, but also a “single aggregate index” (Sakoda, 1981: 245) for all the groups collectively. Precisely, the index is one half of: the sum of the differences of the observed and expected populations of group $j$ in area $i$ for all groups in all areas divided by the sum of each group $j$’s hypothetical proportion in each area $i$ that would achieve perfect segregation across the whole study area.

In the formula below, “$N_i$” is the total population of unit “i”; “$N_j$” is the total population of group “$j$”; “$N_{ij}$” is the group $j$ population of unit $i$; and “$N$” is the total population of the study area (Sakoda, 1981).

$$D_g = \frac{1}{2} \sum_j \sum_i \left[ \frac{N_{ij} - E_{ij}}{N E_j (1 - P_j)} \right]$$

$$E_{ij} = \frac{N_j N_i}{N} \quad P_j = \frac{N_j}{N}$$

In short, Sakoda’s $D_g$ is an average of the residuals within an (r x c) frequency matrix by population group (row) and areal unit (column). A generalized index of dissimilarity
may be useful for assessing the collective residential distribution of three or more groups within a single study area, but it cannot account for inter-group variation or unique population characteristics.

The index of dissimilarity (ID) has been shown to be a relatively simple and efficient statistical calculation for comparing population distributions. However, ID has recently been the focus of a considerable amount of criticism because of its failure to include spatial factors in calculating a segregation index (Wong, 1993; 1998; 1999; 2005). Put simply, ID is only a structural measure of segregation, whereas measures of spatial autocorrelation such as Moran’s I and Getis-Ord G, as well as other distance-based statistics are spatial measures of segregation (Plewe, 2001). The only characteristic that can be analyzed by ID is the absolute “dissimilarity” of group populations between the administrative divisions of a study area. That is, variation in the spatial arrangement of tracts in which group members are located has no effect on the calculated indices (Wong, 1998).

Despite specific methodological limitations, the traditional ID has been shown to be an effective measurement of unevenness (Massey and Denton, 1988), and remains a standard measure of racial and ethnic residential segregation (Iceland, 2002; U.S. Census Bureau, 2004). According to Morrill, the index is “easy to calculate and very useful for relative comparison, at different geographic scales, across classes, races, and class-race combinations, and for the city and county” (Morrill, 1995: 26). However, Morrill admits that ID when used alone cannot effectively measure all aspects of segregation; accordingly, he stresses the importance of applying other measures, including those that account for spatial factors.
Distance-based statistics, such as autocorrelation measures (Morrill, 1995) and "spatial" modifications to ID (Wong, 1993; 1998) can account for the inherently spatial aspects of residential segregation that traditional measures cannot. The spatial aspect of such a statistic typically exists in a function whose value, often binary, depends on whether a point or areal unit is adjacent to or within a certain distance of another point or unit—if so then the pair of locations is assigned a spatial weight of 1 and if not then it is assigned a 0 (Wong, 1998). Spatial weights are assigned to all paired combinations of points or units and the weights are organized in a matrix, which represents the "neighborhood" of each individual unit. The matrix is then used in calculating the statistic, which effectively determines the amount of autocorrelation or clustering of similar values—in the case of segregation, group population values.

Regardless of the increasing attention given to spatial measures of segregation, many researchers continue to apply structural measures to their own studies, including ID and other traditional indices. Formulated in a similar manner as ID, the “P*-type indices” (Lieberson, 1981) have been used extensively for measuring group isolation and interaction with other groups (Lieberson, 1981; Hoong-Sin, 2002; Johnston, 2003). Massey and Denton (1988) claim that the most effective measure of exposure is what is commonly known as the “interaction index” (xP*y), which approximates the likelihood of a member of one group living in the same areal unit as a member of a second [mutually-exclusive] group. The second P* index, known as the “isolation index” (xP*x), determines the likelihood of a group member living in the same areal unit as another member of the same group (Lieberson, 1981). The formulas of the indices of interaction and isolation, respectively, are shown below, with “x_i” and “y_i” being the populations of
groups “x” and “y,” respectively, in tract “i;” “X” being the total population of group “x”; and “t;” being the total population of tract “i.”

\[
x^P_{x^P} = \sum_{i=1}^{n} \left[ \frac{x_i}{X} \left( \frac{y_i}{t_i} \right) \right]
\]

\[
x^P_{x^*} = \sum_{i=1}^{n} \left[ \frac{x_i}{X} \left( \frac{x_i}{t_i} \right) \right]
\]

Hoong-Sin (2002) warns that P* and ID are conceptually very distinct and must be regarded as such, despite the fact that some research has shown a correlation between the two measures. The two most important aspects of segregation are the degree to which groups are evenly distributed geographically and the degree to which group members reside in the same areas. These are independent aspects and are therefore measured differently—the first with ID and the second with a P*-type index. Hoong-Sin offers as an example a hypothetical scenario in which a relatively small minority group is only represented in a few select areas. Dissimilarity may be high but if the group is significantly smaller than the host society or the other minority populations, there may be other groups living in the same areas. Exposure will then be high regardless of dissimilarity. This possible scenario illustrates the importance of analyzing different aspects of segregation by using a different measure for each aspect.

Lieberson (1981) discusses the “asymmetrical” nature of the P* indices—the fact that the value calculated for the first group will not be equal to the value calculated for the second group, as is the case when ID is employed. More importantly, the
implications of a statistical difference between group distributions should reflect the absolute size of each group relative to the other. If blacks constitute 10 percent of the population and whites are the remaining 90, then the amount of segregation will certainly reflect the proportional difference. However, if the amount of segregation is statistically determined with ID, it will not reflect such a difference. In a mutually exclusive two-group population of a hypothetical study area, a 50/50 population composition can produce indices of dissimilarity near to or even equal to those produced by a far less even composition.

To test the difference in results between ID and the P* indices, Lieberson (1981) performed a segregation analysis of whites and blacks for 17 of the larger urban areas (not including those of the South) in the U.S. between 1890 and 1930. ID and xP*x values were calculated for each decade in the time period, resulting in one set of ID values and two sets of xP*x values—for both black and white groups. The mean ID increased each decade from an initial index of about 0.44 in 1890 to 0.62 in 1930. However, a review of xP*x values shows that while white isolation decreased steadily (but remained high: 0.97), black isolation increased drastically in the early decades in the 20th century—from 0.06 in 1890 to almost 0.3 in 1930.

Lieberson remarks that the decreasing isolation of white residents is a significant phenomenon that would not have been detected with the ID alone, even if indices were interpreted in terms of proportions. By utilizing the P*-type indices, Lieberson maintains, asymmetrical population aspects such as isolation can be assessed. He performs a detailed comparison of a compositional variable combined with ID against the
isolation index $xP*x$ and finds that the ID combination “cannot provide a substitute for measurement of the $P*$ index” (Lieberson, 1981; 79).

More recently, Johnston, Poulsen, and Forrest (2003) performed a comparative study of racial and ethnic segregation in the 331 metropolitan statistical areas (MSAs) in the U.S., evaluating the residential patterns of African-Americans, Hispanics, and Asians in 1980, 1990, and 2000. The hypothesis of the study was that the four factors that most strongly influence the degree of residential segregation in a given study area are: metropolitan area size—larger places are more likely to have more segregation; ethnic group size—smaller groups are less likely to be isolated because they are not as “visible;” overall ethnic diversity—cities with two or more large ethnic groups are likely to show “greater spatial separation of the groups” (Johnston, et. al., 2003: 554) and finally, the location of the urban area—southern and northeastern cities tend to be the most segregated and western cities the least segregated. A modified form of $xP*x$ was applied to analyze the segregation of African-Americans, Hispanics, and Asians in various cities across the U.S.

For all three groups in their study, Johnston et al. (2003) found that levels of segregation were higher in larger MSAs and in areas with larger ethnic groups. They also noticed that for African-Americans and Hispanics in all three time periods as well as for Asians in 1980 there was a clear regional division in average levels of segregation; specifically, western cities—especially in California—showed the lowest levels while eastern (especially northeastern) cities showed the highest levels. Johnston and colleagues found more isolation among blacks than Hispanics and Asians, with residential segregation in northeastern cities being the highest. They also determined that
isolation had slightly decreased for blacks but actually increased for Hispanics and Asians, as a result of an increase in immigration.

Hoong-Sin (2002) performed a study of residential exposure of Chinese, Malay, and Indian ethnic groups in Singapore using data collected from government housing surveys in 1980, 1990, and 1996. The study included a general analysis of Singapore as a whole as well as an in-depth analysis of one specific study area by a variety of different enumeration units. The underlying theme of Hoong-Sin’s article is the importance of taking a “contextualized approach” (Hoong-Sin, 2002: 423) to statistical analysis. He notices that many researchers interpret residential segregation patterns by comparing statistical indices to those calculated for Western (particularly American) cities or by using a standard, accepted scale used in studies of Western cities. Instead, statistical calculations should always be in a local context, regardless of the country or region of the study.

Hoong-Sin analyzed the exposure aspect of segregation using the asymmetrical P* indices of isolation (xP*x) and interaction (xP*y), which he explains are more responsive to group size and proportion than the index of dissimilarity. As he had anticipated, the values for isolation reflected the size of the ethnic groups, with the smaller minority groups having lower values than the Chinese majority. Hoong-Sin points out that although the values calculated do not appear to be very high compared to segregation levels in American cities, the important characteristic of the data set is that values exhibit characteristics that reflect Singapore’s local geography.

First, the Malay residents appear to be under-represented in the one- and two-room flats, which are the most common (40-50 percent of all public housing) and of the
lowest quality. Although they have the lowest average income of any group, Hoong-Sin explains the phenomenon with the fact that the Malay exhibit the largest average household size and represent the largest number of extended or multi-nuclear families in Singapore. Accordingly, they require more living space than what is offered by one- or two-room dwellings. The second major difference is that the Indian/Other category—the majority of which is Indian—tends to be over-represented in the smallest, lowest-quality housing units. This tendency can be explained by the fact that many Indian immigrants come to Singapore alone in search of employment, living predominantly in single-room dwellings. Hoong-Sin concludes his study by again stressing the need to interpret segregation indices in a local context.

As with nearly all existing measures of segregation, the P*-type indices have a few significant limitations that must be considered. One is the overestimation of isolation/interaction by indices due to the fact that they are based on mean values, which are greatly affected by the skewness of a distribution (Farley, 2005). Reasoning that population data tends to contain large outliers in their distributions, it may be in some cases more accurate to use median indices—which are not affected by skewness—than the more common mean indices.

Farley (2005) conducts a study of racial segregation (black and white) in the 50 largest metropolitan areas in the U.S. to “determine the degree of variability in the difference between mean and median indices” (Farley, 2005: 21). Citing white-to-black exposure calculated for New York, Chicago, and Detroit, he shows that mean indices range between 5 and 7 percent, whereas the median indices range between only 1 and 2 percent. This has serious real-world implications, especially at the local level, Farley
claims. With a median index of only 1-2 percent, only one in every few blocks will have even one African-American resident. When mean indices are used, it is necessary to at least acknowledge the potential effects of outliers on resulting values.

Plewe (2001) demonstrates another method of assessing segregation in addition to the traditional indices, using a “weighted ternary histogram” to visualize the population composition of three groups in one study area. A triangle is drawn with each of the three corners representing a composition of 100 percent of one group and 0 percent of the two additional groups. Any point within the triangle represents the proportions of the three groups relative to the distance from the point to each respective corner; for example, a point in the middle represents the scenario in which each group occupies one-third of the total population. The triangle can then be divided into sections to represent discrete classes of three group combinations. The ternary histogram can be “weighted” adjusting the size of the dots that represent areal units based on the total population of each unit. Thus, the location of a dot within the ternary histogram indicates the proportion each group comprises in a given enumeration unit and the size of the dot represents the size of the total population of the enumeration unit.

Plewe claims that the use of the weighted ternary histogram in visualizing population composition is more advantageous than traditional indices in that subtle patterns are highlighted more effectively and it is more easily interpreted. However efficient this technique may be, it is obviously limited to a study of three groups. Although more difficult to produce than a traditional choropleth map or matrix of segregation indices, the weighted ternary histogram can be useful for explaining or comparing major population characteristics, such as racial composition (Figure 2.4).
Describing and Classifying Residential Patterns

Beyond calculating indices and visually representing segregation, methods of classifying the residential patterns based on spatial analysis have been developed—at least partially for their use in inter-urban and temporal comparative studies. One of the most frequently cited (Poulsen, et al., 2002; Johnston, et al., 2002) models of classification is Boal’s (1999) categorization of segregation patterns based on significant social, structural, and spatial distinctions. In his paper, Boal (1999) outlines the five basic multi-ethnic residential patterns of his “scenarios approach,” which are: assimilation, pluralism, segmentation, polarization, and cleansing.

Assimilation is defined as “a process that leads from heterogeneity to homogeneity whereby difference reduces and social and spatial boundaries dissolve” (Boal, 1999: 588), which is commonly referred to as the cultural “melting pot” theory (Peach, 2005: 4). Pluralism is the scenario sometimes given the connotation of “multiculturalism” (Peach, 2005), characterized by sharing of ethnic institutions as well as the collective desire to maintain separate identities. Pluralism can be subdivided on the basis of group equality in terms of socioeconomic status. The next scenario, segmentation, is more “sharply defined” (Boal, 1999: 589) in terms of the social and spatial division of ethnic groups, with an increased likelihood of insecurity, mistrust, or even violence at the local level. The fourth category is polarization, marked by sharp ethno-national divisions that lead to problems in government and planning policymaking. The desire for autonomy or territorial separation is common in areas characterized by
polarization. Finally, cleansing is defined as the forced removal of a minority ethnic
group or groups by the host population—in many cases through violent means.

Boal (1999) offers the following cases as examples of the five scenarios: the early 20th century U.S. city as assimilation; late 20th century Toronto as pluralism; the black ghetto in America as segmentation; Jerusalem and Belfast as polarization; and finally, 1990s Sarajevo as cleansing. He also stresses the importance of considering several different scenarios existing simultaneously in a multi-group context, in which interaction and social/spatial division varies from group to group. Boal’s five-scenario approach is an informative example of how segregation patterns can be classified to aid in the description and comparison of different study groups or locations.

Peach (1996) discusses the causes and effects of both positive (voluntary) and negative (forced) segregation, as well the situations in U.S. that represent the opposite types of segregation. The example of positive segregation offered is the European or “three-generational model” (Peach, 1996: 138), which focuses on the role of the ethnic enclave during the late 19th and early 20th centuries in facilitating assimilation at a comfortable rate from within a protective environment. The traditional three-generational model assumes that the first generation, consisting of foreign-born immigrants, resides in an inner-city ethnic neighborhood and experiences residential segregation as the first step in socially adapting to the new environment. The second generation moves beyond the urban core and disperses somewhat, as they continue the process of assimilation. Finally, the third generation migrates even farther outward into the suburban areas and becomes fully assimilated.
According to Peach (1996), the universality of the three-generational model was rejected when it became apparent that African-American populations were usually more segregated than Hispanic populations, even though African-Americans have been residing in the specific metropolitan areas much longer than the recently arriving Hispanic immigrants. Using supporting information from numerous studies, he maintains that African-Americans occupy the only true ghettos in the U.S. These ghettos are characterized by extraordinarily high isolation—blacks comprise a clear majority in all areas and concentration—the majority of the city’s black population resides in relatively few select areas. Peach explains that the African-American situation clearly illustrates the negative segregation that continues to exist in the U.S. The European and the African-American models remain the two major categories of segregation in American cities, with the former characterized by positive factors and the latter by negative factors.

In a comparative study of urban residential patterns in New York, Sydney, and Auckland, Poulsen, Johnston, and Forrest (2001) formulated “multi-attribute classification schema” incorporating variations of four of Massey and Denton’s five dimensions of segregation (all but centralization) to both calculate and interpret statistical indices. Poulsen et al. implement a rule-based system to classify the areas based on the results. The system includes, among several rules and requirements, pre-determined statistical thresholds for delineating boundaries of ethnic pockets.

The classification of residential areas is based on subdivisions of the study area’s minority enclaves and host community. Minority enclaves are divided into: associated assimilation-pluralism enclaves, where the host society is a large proportion but not the majority of the area; mixed-minority enclaves, shared by multiple minority groups;
polarized enclaves, containing one dominant minority group with very few members of other groups or the host society; and ghettos—where there is a very large majority of one group, a large proportion of whose total population resides in such ghettos. On the other hand, the host community is divided into two groups—non-isolated and isolated. In non-isolated host communities there is a substantial representation of one or more minority groups, whereas in isolated host communities the minority groups are more or less absent. Among the most significant characteristics of Poulsen and colleagues’ (2001) study is the fact that he offers a realistic and understandable method of describing ethnic enclaves, which may prove useful in future studies of residential segregation.

In another comparative analysis of residential patterns in New York, Sydney, Australia and Auckland, Poulsen, Johnston, and Forrest (2002) tested the applicability of the generalized “American model” of segregation to cities in other parts of the world. The authors begin with their own brief outline of the American model, separating populations experiencing segregation into three distinct categories.

The first is that of the historic European immigrant groups, followed by recent Hispanic and Asian groups, and finally African-Americans migrating out of the southern states. According to Poulsen et al. (2002), many European immigrant groups initially lived in low-income, inner-city neighborhoods—experiencing high levels of segregation—but eventually assimilated into mainstream American society. Hispanics and Asians, the latter of which they refer to as “globalized professionals” (Poulsen, et. al., 2002: 229), arrived more recently and continue to arrive, showing signs of isolation and segregation in some areas. Finally, African-Americans are the most-segregated group in America, suffering “both economic and cultural discrimination in labor and housing

Based on a methodology described by Peach (1996), Poulsen et al. (2002) analyze three aspects of residential segregation: concentration, assimilation, and encapsulation (very similar to Massey and Denton’s (1988) ideas of concentration, exposure, and isolation). The authors criticize the traditional measures of segregation, including those outlined in Massey and Denton’s (1988) research, due to their strong dependency on “each group’s relative and absolute size within a city” (Poulsen, et. al., 2002: 233). Instead, they propose a categorization of ethnic group populations according to percentage thresholds. For example, their index of residential concentration is formulated by first classifying an ethnic group’s areal unit populations according to the group’s proportion of the total unit population and then calculating the percentage of each group’s total population living in areas above each threshold.

Poulsen and colleagues (2002) found in their analysis that the ethnic groups of New York exhibited the strongest segregation patterns, with African-Americans and whites showing the highest levels of residential encapsulation. In Sydney the authors found little concentration of any groups except for the Australian-born host society. Auckland was found to be somewhere between New York and Sydney in terms of segregation levels, with New Zealand Europeans being the most encapsulated or concentrated, followed by Pacific Islanders, with no recent European immigrants, Maori, or Asians living in areas where they are the majority. The only ethnic groups among the three study areas with comparable levels of segregation are the Hispanics of New York.
and the Pacific Islanders of Auckland. Thus, Poulsen, Johnston, and Forrest warn against
the use of the American model out of the American context.

Important Social Factors in Addition to Ethnicity

Some of the early research on residential segregation focused on the effects of
cultural factors such as religion and nationality on assimilation patterns (Gordon, 1964),
while the common theme of many contemporary studies relates to socioeconomic
differences, including those of occupation (Ellis, et. al., 2004), income (Allen and Turner,
1996), class (Morrill, 1995), and preference (Clark, 1992).

Allen and Turner (1996) conducted a study of 12 major immigrant communities
in Los Angeles, identifying the complex relationship between cultural, economic, and
spatial assimilation. The immigrant communities included various European, Latin
American, Asian and Middle Eastern ethnicities. Allen and Turner’s hypothesis: “As
distance from the [ethnic] concentration increases, the relative assimilation of individuals
should also increase” (Allen and Turner, 1996).

Utilizing individual-level data from the U.S. Census Bureau’s 5-percent “Public
Use Microdata Sample” (PUMS) of the Los Angeles Consolidated Metropolitan
Statistical Area (CMSA), which is divided into 91 Public Use Microdata Areas
(PUMAs), the authors calculated the median values of chosen assimilation variables.
Variables selected for cultural assimilation included proficiency in English, citizenship
status, and educational attainment, whereas income was chosen as the sole representative
of economic assimilation. The PUMAs of the Los Angeles CMSA were then classified
by the “relative concentration” of ethnic populations—based on the public perception of ethnic characteristics—into three categories: highly concentrated; dispersed; and highly dispersed. Unfortunately, the authors do not provide an explanation of how public perception was assessed. Using the median values of the assimilation variables, the authors analyzed the “zonal differentiation” (Allen and Turner, 1996: 141) of cultural and economic factors for each of the 12 ethnic groups.

Allen and Turner (1996) found that intra-group variation in the spatial distribution of English proficiency and educational attainment are greater for foreign-born than for native-born populations because of the educational opportunities available to all socio-economic classes in the U.S. They also noted that the zonal differentiation of income was greater for men than women, which they attributed to the fact that women’s earnings are less of a factor in housing choice for minority ethnic groups. In concluding their study, Allen and Turner claim that immigrants residing in concentrated ethnic enclaves tend to exhibit lower educational attainment, rates of naturalization, and income in addition to less English language.

In a similar study of socioeconomic assimilation, Morrill (1995) compared the levels of racial and class segregation among non-Hispanic whites, Asians, and African-Americans in Seattle—a place the author describes as a “liberal metropolis” (Morrill, 1995: 22). His hypothesis is that, in modern society, class should be a more significant factor in residential segregation than ethnicity or race, due to the apparent decrease in racial discrimination and rise in socioeconomic status of minority groups.

To test this hypothesis, Morrill assessed the segregation of the three racial groups listed above and of poor (annual incomes below $25,000), middle ($25,000 - $50,000),
and rich (above $50,000) socioeconomic classes by tract for both Seattle and King County as a whole. He first maps concentrations of the various population groups and then calculates dissimilarity and isolation indices (as structural measures) as well as spatial autocorrelation and spatial interaction. Morrill (1995) employs structural measures for the race versus class issues and spatial measures for a more in-depth analysis of racial segregation.

The results of Morrill’s study indicate the opposite of his hypothesis, in support of earlier findings of race being a more significant cause of segregation than class. Differences in class only account for a small percentage of racial segregation and segregation of the same racial group by class is less evident than segregation of the same class group by race. Specifically, black rich to white rich segregation is greater than black rich to black poor segregation.

In another case study of segregation in Los Angeles, Ellis, Wright, and Parks (2004) compare residential and work segregation for native-born and immigrant groups. They state that the dominance of research on residential segregation ignores the fact that different patterns may exist among the spatial distribution of ethnic and racial groups in their places of work. The authors claim “an exclusive focus on neighborhood residential geographies features only residents who sleep in those places” (Ellis, et al., 2004: 620); however, it is obvious that the average American citizen does far more than sleep in his or her home. Nevertheless, the study raises an important question regarding the implications of a longstanding academic focus on residential segregation alone.

Ellis and colleagues’ (2004) analysis reveals levels of residential segregation twice as great as those of work tract segregation. Interestingly, the ethnic division of
labor that exists in Los Angeles and most of southern California is more likely to influence residential segregation than work tract segregation. As an example, the authors state that many Mexican immigrants hold low-level service positions in the same places where native-born whites hold upper-level management positions (Ellis, et al., 2004).

In yet another case study of Los Angeles, Clark (1992) returned to his research focus on the role of group preference in the persistence of residential segregation into the late 20th century. In this particular study, he compared the stated residential preferences of ethnic group members to their actual residential choices to determine the significance of preference on residential patterns. In support of his study, Clark stated that the majority of research on the subject emphasizes the effects of government policy, housing markets, and financial institutions on residential segregation, a trend that has “downplayed the role of preferences” (Clark, 1992: 452). Those studies that have examined the issue of preference tended to focus more on the negative concept of “avoidance”—primarily white avoidance.

Using a computer-assisted telephone interview technique, Clark surveyed the City of Los Angeles and achieved a 71 percent response rate. Data was collected for 2,644 households representing “Anglo, non-Hispanic,” black, and Hispanic, and Asian ethnic groups, who were asked hypothetical questions of ethnic preference as well as the locations of current and previous residences.

The results of Clark’s (1992) study indicate that Anglos have a strong preference for neighborhoods that are 70 percent or more Anglo. Regarding actual residential choice, 90 percent of Anglo households relocate to areas than are less than 10 percent black—an overwhelming 96 percent achieving their respective preference. However,
none of the Anglo respondents who prefer 50/50 compositions actually choose such
eighborhoods. Most blacks and Hispanics prefer and choose neighborhoods that are at
least 80 percent of their own race/ethnicity. Only about a third of the blacks and a quarter
of the Hispanics that prefer 50/50 neighborhoods actually live in those areas, most living
in neighborhoods with a majority of their respective ethnic group. Finally, most Asians
achieve their stated preferences, making them the more similar to Anglos than either of
the two other groups. However, a large number of Asians prefer and choose
neighborhoods in which Asians are the minority (less than 50 percent Asian). In

conclusion, Clark (1992) claims that the “white avoidance” theory is insufficient in
explaining patterns of residential choice—all ethnic groups tend to prefer areas that have
larger proportions of their own group.

Other researchers have examined the relationship between residential segregation
and more complex social factors, such as intermarriage (Peach, 1980, 1996) and national
ideology (Falah, 1996). With case studies in New Haven, Connecticut in 1900, 1930, and
1950, Peach (1980) defends his hypothesis that intermarriage is more likely to occur
among ethnic groups within close proximity to one another. Peach’s study includes
several groups, including those to which German, French, Irish, Polish, and Jewish
residents belong. This hypothesis helps to explain the spatial diffusion and mixing of
ethnic groups that has been increasing steadily in American cities over the past several
decades.

Falah (1996) conducts a thorough analysis of the “hyper-segregation” that exists
in mixed Arab-Jewish cities in Israel. He contends that the situation that exists cannot be
accurately assessed according to the American model of segregation, due to the lack of
any sharp distinction between either racial or linguistic characteristics of Arabs and Jews. Instead, the factor largely responsible for creating residential segregation in modern Israel is a state-supported national ideology of Jewish exclusivity. This factor not only forms a spatial division between Jews and non-Jews—predominantly Arabs—but also a socioeconomic division between the two groups. Although there is little similarity between the segregation that exists in Israel and the residential patterns of European ancestry groups in the U.S., Falah’s (1996) study supports the idea that statistical conclusions must be interpreted in a human context.
CHAPTER III

METHODOLOGY

Selection of study areas and target populations

The literature discussed in the previous chapter serves as an introduction to ethnicity, immigration, and residential segregation in American cities—building a strong foundation for approaching more complex topics. In addition, such knowledge is necessary for understanding patterns noted through the application of statistical techniques. An examination of ethnic residential patterns is meaningless without an understanding of the cultural and historic issues involved, regardless of the functionality of a well-developed methodology. The methodology of this study is based largely on techniques of spatial analysis and statistical procedures, the results of which must be interpreted with regard to the human aspects of residential distribution.

I examined the spatial patterns of ethnicity in America—manifest in the residential patterns of individuals who identify with individual ancestry groups—by using case studies in two eastern cities, Pittsburgh and Cleveland. Neither city is home to a substantially large total population in comparison to other American cities. Moreover, relatively few recent immigrants have settled in these cities compared to larger metropolitan areas such as New York, Los Angeles, and Chicago.
However, Pittsburgh and Cleveland were historically major immigrant destinations, especially during the Industrial Revolution of the late 19th and early 20th centuries (Ward, 1989). Today, many of the two cities’ American-born residents are the descendants of European immigrants who migrated to the United States in search of employment opportunities and a better quality of life. The fact that cultural heritage has managed to survive through several generations—at least to the extent that data on ancestry can be collected by the U.S. Census Bureau—serves to justify research on the historic (and continual) process of spatial assimilation in America. Through identifying significant differences between the spatial distributions of ethnic groups in Cleveland and Pittsburgh in 1940 compared to 2000 I gained insight into the nature of the assimilation process. More importantly, by performing this study I determined whether patterns of settlement and spatial assimilation are more closely related to ethnicity or location.

As mentioned in previous chapters, the populations of Allegheny and Cuyahoga counties that reside outside of the Pittsburgh and Cleveland city limits, respectively, are nearly as large as those residing within the actual cities. Also, smaller cities exist in both counties that were home to major industrial firms throughout the first half of the 20th century, including for example the National Tube Co. in McKeesport, PA; as a result, those cities lying within the peripheries of Pittsburgh and Cleveland attracted significant immigrant populations. Finally, in both counties—Cuyahoga County especially—substantial numbers of inner-city residents, many of which are the children and grandchildren of European immigrants, have in recent decades migrated to the outlying suburbs of Pittsburgh and Cleveland. Because of the three characteristics discussed above, it is necessary to perform this study at the county level. Limiting the analysis to
only the two central cities would have overlooked aspects of the suburban migration that has served as a critical function of spatial assimilation.

Also, the Pittsburgh and Cleveland metropolitan areas have numerous shared characteristics that allow for a comparative study of ethnic residential patterns. First of all, both cities have populations that are very close in size, although both are relatively smaller than most other major American cities. According to census data, in 2000 Allegheny County was home to approximately 1.3 million people, whereas Cuyahoga County had a slightly larger population, nearly 1.4 million (2000 Census). It should certainly be noted that total population counts as well as specific demographic characteristics have changed since the 2000 Census data was collected; however, it is unlikely that either of the two factors underwent drastic changes—especially in regard to European ancestry groups.

In addition to similarly sized total populations, the two areas have remarkably similar [European] ethnic compositions (Figure 3.1). Of all the ancestry categories included in the survey, German is—by far—the largest group in both counties. The second largest ancestry group in Allegheny County is Italian, which is the third largest in Cuyahoga County (Figure 3.2). On the other hand, the second largest ancestry group in Cuyahoga County is Irish, which is the third largest in Allegheny County. Thus, it can be seen in a brief comparison of total population and population composition that the Pittsburgh and Cleveland metropolitan areas are very similar in terms of European ancestry, making them ideal study areas for a comparative analysis of ethnic residential patterns.
Figure 3.1 – Multi-ethnic compositions of Allegheny County and Cuyahoga County

Figure 3.2 – Ethnic group populations in Allegheny County and Cuyahoga County
The most significant discrepancy between the European ancestry groups of the two study areas is the fact that almost all of the groups have larger populations in Allegheny County. Among these groups are German, Irish, Italian, and Slovak, whereas the groups that are larger in Cuyahoga County are Polish, and Hungarian.

Of the various ethnic/ancestry groups discussed, I chose to include six in the study: German, Hungarian, Irish, Italian, Polish, and Slovak, all of which have considerable populations in both study areas. The groups selected serve as an accurate representation of the immigrant groups that settled in both Pittsburgh and Cleveland and whose descendants constitute a major portion of the current population.

The German and Irish ancestry groups represent the first major wave of European immigration to the U.S. during the 19th Century. Thus, they are often referred to in immigration-related literature as “old immigrants.” Although other groups of Northwest Europe, including the English, Welsh, and Scottish, comprise a proportion of the total old immigrant population, the German and Irish groups constitute a clear majority. Today they are most concentrated in a few select regions, but reside throughout the entire U.S. (Figures 3.3 and 3.4). (Figures 3.3 through 3.8 show the standard deviation of group population proportions in U.S. counties. Counties with average proportions are shown in white.)

By the time the new immigrants of Italy and the Austro-Hungarian nations arrived around 1880, both the German and Irish groups had already established themselves in the social order of the American city and thus experienced a certain degree of cultural assimilation. Because of this characteristic, I included the German and Irish ethnic
Figure 3.3 – Spatial distribution of German ancestry in the U.S., 2000
Spatial Distribution of Irish Ancestry in the U.S., 2000
by County

Figure 3.4 – Spatial distribution of Irish ancestry in the U.S., 2000
populations in the study, in part, to test the hypothesis that groups which have had a longer presence in the U.S. exhibit lower levels of segregation.

On the other hand, the remaining four ethnic groups represent the new immigrants and their American-born descendants. The Italian and Polish ancestry groups have significant populations in numerous metropolitan areas of the U.S., primarily those in the northeast, including Pittsburgh and Cleveland (Figures 3.5 and 3.6). They both represent considerable percentages of the total populations of both study areas. However, the Hungarian and Slovak groups are much smaller than the Italian and Polish groups; each is less than half the size of the Polish population in both areas, less than one third of the Italians in Cleveland, and less than one fifth of the Italians in Pittsburgh. Nonetheless, there are certain characteristics of the Hungarian and Slovak ancestry groups that make them appropriate for inclusion in the analysis.

Allegheny County has the largest Slovak population in the U.S., followed by Cuyahoga County (Tables 3.1 and 3.2). On the other hand, Cuyahoga County is home to the largest Hungarian population, followed by Los Angeles County (Census 2000). Ohio is the state with the most Hungarian-Americans, nearly 40,000 more than the second largest (California, followed by New York then Pennsylvania). While the Italian and Polish ethnic groups have considerable populations in many different metropolitan areas throughout the country—like the German and Irish—the Slovak and Hungarian ethnic groups are more limited in geographic distribution, concentrated heavily in southwestern Pennsylvania and northeastern Ohio (Figures 3.7 and 3.8). In addition to the similarities
Spatial Distribution of
Italian Ancestry in the U.S., 2000
by County

Source: PCT16, U.S. Census 2000
Projection: North American, Albers Equal-Area Conic

Figure 3.5 – Spatial Distribution of Italian Ancestry in the U.S., 2000
Figure 3.6 – Spatial Distribution of Polish Ancestry in the U.S., 2000

Source: PCT16, U.S. Census 2000
Projection: North American, Albers Equal-Area Conic

1 Dot = 5,000 People
Table 3.1 - U.S. counties with the largest Hungarian ethnic populations

<table>
<thead>
<tr>
<th>County</th>
<th>Total</th>
<th>Hungarian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuyahoga County, Ohio</td>
<td>1,393,978</td>
<td>32,097</td>
</tr>
<tr>
<td>Los Angeles County, California</td>
<td>9,519,338</td>
<td>29,194</td>
</tr>
<tr>
<td>Wayne County, Michigan</td>
<td>2,061,162</td>
<td>19,805</td>
</tr>
<tr>
<td>Middlesex County, New Jersey</td>
<td>750,162</td>
<td>16,887</td>
</tr>
<tr>
<td>Cook County, Illinois</td>
<td>5,376,741</td>
<td>14,659</td>
</tr>
<tr>
<td>Allegheny County, Pennsylvania</td>
<td>1,281,666</td>
<td>14,459</td>
</tr>
<tr>
<td>Kings County, New York</td>
<td>2,465,326</td>
<td>13,648</td>
</tr>
<tr>
<td>Fairfield County, Connecticut</td>
<td>882,567</td>
<td>12,343</td>
</tr>
<tr>
<td>Summit County, Ohio</td>
<td>542,899</td>
<td>10,706</td>
</tr>
<tr>
<td>Maricopa County, Arizona</td>
<td>3,072,149</td>
<td>10,617</td>
</tr>
</tbody>
</table>

Table 3.2 - U.S. counties with the largest Slovak ethnic populations

<table>
<thead>
<tr>
<th>County</th>
<th>Total</th>
<th>Slovak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allegheny County, Pennsylvania</td>
<td>1,281,666</td>
<td>35,406</td>
</tr>
<tr>
<td>Cuyahoga County, Ohio</td>
<td>1,393,978</td>
<td>33,527</td>
</tr>
<tr>
<td>Westmoreland County, Pennsylvania</td>
<td>369,993</td>
<td>15,373</td>
</tr>
<tr>
<td>Luzerne County, Pennsylvania</td>
<td>319,250</td>
<td>14,263</td>
</tr>
<tr>
<td>Mahoning County, Ohio</td>
<td>257,555</td>
<td>13,660</td>
</tr>
<tr>
<td>Cook County, Illinois</td>
<td>5,376,741</td>
<td>11,598</td>
</tr>
<tr>
<td>Lake County, Indiana</td>
<td>484,564</td>
<td>8,411</td>
</tr>
<tr>
<td>Cambria County, Pennsylvania</td>
<td>152,598</td>
<td>7,781</td>
</tr>
<tr>
<td>Fairfield County, Connecticut</td>
<td>882,567</td>
<td>7,540</td>
</tr>
<tr>
<td>Trumbull County, Ohio</td>
<td>225,116</td>
<td>7,458</td>
</tr>
</tbody>
</table>
Figure 3.7 – Spatial distribution of Slovak ancestry in the U.S., 2000
Figure 3.8 – Spatial distribution of Hungarian ancestry in the U.S., 2000
that exist between the populations of Pittsburgh and Cleveland, the similar social and economic histories of the two areas should be acknowledged before conducting an analysis of residential patterns. The present residential patterns are not a random distribution of ethnic, racial, and class groups across the land area suitable for residential use, but the unique manifestations of social and economic processes—assimilation and segregation among the former as well as housing market characteristics and regional economic changes among the latter.

Time Periods of Analysis – 1940 and 2000

The two specific years I chose for the temporal analysis of this study are 1940 and 2000, largely due to the availability of necessary data. The decennial U.S. Census of 1940 is the first appearance of tract-level census data organized by county. Older censuses were often organized by county, city, or municipality, with no division of internal boundaries or distinction between different sections of the whole administrative unit. In some cases, however, surveys were conducted at the individual or household level (as with the Public Use Microdata Samples). Such surveys may be very precise but obviously present a major logistical problem when an analysis of six study groups in two counties is to be conducted. Data sets organized at a level more precise than that of the census block would not be practical and are therefore not utilized in this study.

Before undertaking the statistical analysis of data collected at two different times, I found it necessary account for the differences in census tract boundaries, which would have otherwise had an unwanted effect on the analysis. From one decennial census to the
next it is not uncommon to find a few smaller tracts grouped together, larger tracts split into two or more tracts, or boundaries slightly adjusted.

To reduce the potential effects of using different boundaries, I adjusted both 1940/2000 sets for both study areas so that the differences in the size and total number of census tracts were minimal. Using GIS applications, I merged groups of adjacent tracts and added their group population counts. If a large tract in 1940 was split into two smaller tracts in 2000, then the two tracts in the 2000 layer were merged together; likewise, if two smaller tracts in 1940 were grouped together in 2000, then the two tracts in the 1940 layer were merged.

Larger units cannot be divided into several smaller units (without using more precise data), as it is impossible to know how to divide the original populations—it is a fallacy to claim that if a census tract is split in half then half of its population will be in one side and half in the other. Thus, merging the census tracts of both years’ boundary layers is the only method of minimizing the differences between the layers. In Allegheny County, there were 488 tracts in 1940 and 416 tracts in 2000; I adjusted the boundaries so that there were 327 in the 1940 layer and 312 in the 2000 layer. In Cuyahoga County, there were 341 tracts in 1940 and 502 tracts in 2000, adjusted to make 327 tracts in both 1940 and 2000 boundary layers.

The 1940 data under analysis, extracted from an electronic compilation of historic census data known as the Elizabeth Mullen Bogue File (Bogue, 1960), pertains to country of origin for the foreign-born population. Each nationality included in the survey has a group population count for every individual census tract. I appended this data to the census tract boundary layers edited in GIS to assess the residential distribution of
European immigrants in Allegheny and Cuyahoga counties in 1940. Although tract-level data on country of origin exists in every decennial census since 1940, it is insufficient for a spatial analysis of ethnicity, a social characteristic that exists in the U.S. even among the country’s native-born citizens. The offspring of foreign immigrants constitute a significant proportion of a given ethnic group, although their existence cannot be identified using data on country of origin.

The 1980 Census was the first to include survey questions regarding ancestry, which were also included in the following two censuses. The 2000 data set contains the most recent information available, estimated using 1-in-6 sample data collected at the tract level (2000 Census). Despite the fact that “country of origin for the foreign-born population” (1940 Census) and “ancestry” (2000 Census) are different conceptually, these variables are sufficient in this study because of the close relationship between the two. That is, in 1940, an immigrant from Poland was very likely to be of Polish ethnicity. The only exception among the ethnic groups is that of the Slovaks, whose forebears originate from what was identified as “Czechoslovakia” in the 1940 U.S. Census, which also included individuals of Czech ethnicity. However, data is also available in the 2000 Census on Czech ancestry, so it is possible to compare the present extents of Czech and Slovak ethnicity in the two study areas.

After doing so, I found that the Slovak ancestry group was much larger in both metropolitan areas—35,000 Slovaks compared to about 3,900 Czechs in Allegheny County and 33,500 to 14,000 in Cuyahoga County. Because the Czech group is about half of the Slovak group in the Cleveland area, I referred to historic studies and other
secondary sources in order to help distinguish between major Czech and Slovak enclaves (Fordyce, 1933; Barton, 1975).

Also, reasonable assumptions could be made about the relationship between noticeable tract clusters of Czechoslovak immigrants in 1940 and existing Czech and Slovak clusters. For example, a specific tract or group of tracts that was inhabited by a significant Czechoslovak population in 1940 and shows a slightly dispersed pattern of Czech ancestral affiliation in 2000 was likely to be a Czech enclave—however, that is not to say that coincidental intra-county migration of Czechs and Slovaks cannot or will not occur. Nonetheless, the considerable size difference between Czech and Slovak groups coupled with the availability of historic information to verify assumptions allowed me an acceptable margin of error in analyzing the historic and contemporary residential patterns of the Slovak ethnic group.

There were several factors involved in employing the 1940 data set that made it ideal for this study. Namely, the majority of the new immigrant generation—all groups in the study except German and Irish—was likely to still be alive and even residing in the same neighborhoods or districts in which they initially settled. Individuals in their 20s or 30s arriving during the peak decade of immigration, 1900-1910, would have been in their 50s or 60s in 1940, assuming they would die of natural causes. Also, most immigrants probably had children living in the same household or within relatively close proximity, increasing the size of the ethnic population.

As for the German and Irish groups, the largest migration to the two areas came decades before the influx of Southern and Eastern European peoples, making the immigrant generation either very old or deceased by 1940. Immigration from
Northwestern Europe continued into the early 20th century but declined in nearly every region (Ward, 1989). As a result of this occurrence, the presence of 2\textsuperscript{nd} or 3\textsuperscript{rd}-generation German and Irish ethnic populations—the children or grandchildren of immigrants from those countries—living in original ethnic enclaves could not be identified using the 1940 Census data.

Of course, areas that contained high numbers of foreign-born German and Irish individuals in 1940 were probably where the recent immigrants of those nationalities settled; nonetheless, the first-born American generations of the old immigrant groups may have already changed their residential patterns by 1940. Consequently, I did not examine mean center change for the German and Irish ethnic groups. I included them in the analysis primarily for comparison with the new immigrant ancestry groups in 2000, under the hypothesis that old immigrant groups will show significantly lower levels of segregation—in both 1940 and 2000—because of a longer time since initial settlement relative to new immigrant groups. Also, the German and Irish groups of Pittsburgh were compared to those of Cleveland to identify and evaluate any distinctions between the two study areas.

Measures of Segregation

I employed three traditional structural measures of segregation and one spatial measure to analyze four different dimensions of segregation—unevenness, exposure, concentration, and clustering. I used ID to measure unevenness, because it is both easy to calculate and easy to interpret. Although still widely used among academia as the
primary measure of segregation, critics of the index and its applicability have pointed to its “aspatial” nature (Wong, 1993) as well as its failure to take into account significant differences in population size between groups (Lieberson, 1981).

However, the index was almost always criticized as a single, comprehensive measure of segregation and not as a measurement of only one aspect of segregation. Two characteristics of this study account for the apparent limitations of ID. First, I analyzed the inherently spatial patterns of ethnic residence with a different statistic, independent of ID. Second, the measurement of exposure that I used in this study accounts for variation in group population size.

I calculated ID for two different sets of values: the first set was both mutually-exclusive and exhaustive, with each pair consisting of an ethnic group and the remaining population outside the ethnic group (i.e. – Germans and non-Germans); the second set was only mutually-exclusive and is composed of 15 different combinations of ethnic group pairs (i.e. – Germans and Hungarians). Of the various statistics calculated in this study, the dissimilarity index is the only one I used to assess the patterns that exist between different study groups. All others I utilized solely to measure the patterns of individual groups relative to the population outside of each group.

In this study I employed the isolation index, or $xP^*x$, one of the two traditional measures of exposure, known together as the “P*-indices” (Lieberson, 1981; Farley, 2000). The index measures the likelihood of a group member residing in the same areal unit as another member of the same group. I chose to use this particular index, in part, because it is calculated once for each study group, as opposed to the other P index—the interaction index or $xP^*y$—which must be calculated for a pair of groups to determine the
likelihood of one group living alongside the other and vice versa. In calculating xP*y, values are calculated for both groups in each possible pair, meaning that a total of 30 values would be produced in a study of six groups, which is too cumbersome considering that three other measures were also employed in this study.

The fact that xP*x is easier to apply in this scenario than xP*y does not imply that it is any less accurate—it simply measures a different characteristic, one that is sufficient for the level of precision required in this study. The traditional structural measure xP*x has shown to be effective in several case studies (Lieberson, 1981; Morrill, 1995; Iceland, 2002; Johnston, 2003). The “asymmetrical” nature of the index (Lieberson, 1981) allows for group size to have an effect on the calculation, giving it an advantage over the index of dissimilarity.

The third measure of segregation I calculated was delta—a common statistic for analyzing group concentration (Iceland, 2002; U.S. Census Bureau, 2004). As with xP*x, one value is produced for each group when delta is calculated. Some researchers, including Massey and Denton, prefer a more complex measure of concentration, such as the spatial proximity index. However, delta is far easier to calculate and provides an efficient assessment of ethnic concentration.

I made the decision to use measures of segregation that are relatively straightforward and not too difficult to calculate for a specific reason—this study is meant to assess the residential patterns of ethnic groups, not the effectiveness of segregation indices. Focusing too much attention on the specific measures would have drawn attention away from the patterns that are being assessed and the social forces that have created them, ultimately diminishing the effectiveness of the study.
Finally, I calculated a distance-based autocorrelation statistic to assess ethnic clustering. According to Morrill (1995), “spatial autocorrelation and spatial interaction permit a more directly geographical perspective” (Morrill, 1995: 36). Moran’s I was chosen because it is probably the most well understood and widely accepted among the various measures of autocorrelation. Moran's I is known as a *global* indicator of autocorrelation, which measures spatial clustering of values assigned to points or polygons throughout an entire study area and produces an index between 0 and 1 to describe the level of clustering or autocorrelation. On the other hand, *local* autocorrelation statistics are used primarily to locate specific clusters of values that exist within large areas that may not exhibit strong overall autocorrelation (Anselin, 1995; Getis and Ord, 1995). Also known as local indicators of spatial association (LISA), these statistics have gained considerable popularity for use in spatial analysis. However, for this study a global statistic was more efficient for assessing clustering throughout large study areas.

For all measures of segregation, I compared the resulting values to each other within each study area, across both study areas, and across time (using values from the 1940 and 2000 data sets). Finally, when possible, I verified the patterns that I observed among the data sets using sources that specified the known locations of ethnic enclaves (Barton, 1975; Bodnar, 1982; Byington, 1910; Grabowski, 1976; Klein, 1938) and ethnic institutions, specifically churches (Fordyce, 1933; Papp, 1981; Pankuch, 2001). For Cuyahoga County, I produced a map of ethnic enclaves, defined as being any tract or group of tracts with at least ten percent of the total population belonging to a single ethnic group. In the case of a census tract with ten percent or more of more than one group,
which was very infrequent, I excluded the tract. Many of the specific ethnic clusters observed in the quantitative mapping process were identified in the sources mentioned above. If provided in the literature, I included the locally-known names of the enclaves in the maps.

I also created a map of the Cleveland area in 1940 that compared national church location with ethnic population for Slovaks and Hungarians. Furthermore, I explained spatial patterns using information about the social and economic mechanisms that likely influenced the residential distribution of ethnic groups (Couvares, 1984; Schreuder, 1989; Ward, 1971, 1989). As mentioned in introduction, the spatial analysis of statistical data without any interpretation or consideration of real-world phenomena is a postitivist endeavor that will contribute very little to an understanding of ethnic segregation.
CHAPTER IV.
RESULTS AND DISCUSSION

Overview of the Results

1940 Data

Using the 1940 census data on country of origin for the foreign-born population, the ethnic group exhibiting the highest level of unevenness in Allegheny County was that of the Slovaks—the index of dissimilarity for that group is approximately 0.53 (Table 4.1). Such a value is indicative of a moderately high level of unevenness. On the other hand, the lowest index of dissimilarity calculated was for the German ethnic group—a value of 0.27, which is moderate but still not high enough to suggest any significant segregation. It is no surprise that the eastern European groups exhibit the most unevenness while the old immigrant groups show the least unevenness, with the Italians in between, nearest the mean ID of 0.42.

In Cuyahoga County the group showing the highest level of unevenness was the Polish, for which an ID of 0.55 was calculated (Table 4.2). As in Pittsburgh, the German-born population exhibited the lowest level of unevenness with an ID of 0.25, very close to the value calculated for Pittsburgh’s German population. Both study areas had similar variation among the indices of dissimilarity calculated for the 1940 data set.
However, a notable difference is that the Italians of Cleveland showed the second highest level of unevenness, significantly higher than their countrymen in Pittsburgh.

Table 4.1 – Segregation indices of study groups in Allegheny County

<table>
<thead>
<tr>
<th></th>
<th>1940</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ID</td>
<td>XP*x</td>
</tr>
<tr>
<td>GERMAN</td>
<td>0.266</td>
<td>0.019</td>
</tr>
<tr>
<td>HUNGARIAN</td>
<td>0.473</td>
<td>0.018</td>
</tr>
<tr>
<td>IRISH</td>
<td>0.364</td>
<td>0.011</td>
</tr>
<tr>
<td>ITALIAN</td>
<td>0.397</td>
<td>0.047</td>
</tr>
<tr>
<td>POLISH</td>
<td>0.467</td>
<td>0.041</td>
</tr>
<tr>
<td>SLOVAK</td>
<td>0.527</td>
<td>0.038</td>
</tr>
<tr>
<td>MEAN*</td>
<td>0.446</td>
<td>0.031</td>
</tr>
<tr>
<td>TOTAL POP.*</td>
<td>0.674</td>
<td>0.123</td>
</tr>
</tbody>
</table>

ID: Index of dissimilarity; xP*x: isolation index; M(I): Moran’s I
*Mean index of the study groups
** Index of the total population

Table 4.2 – Segregation indices of study groups in Cuyahoga County

<table>
<thead>
<tr>
<th></th>
<th>1940</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ID</td>
<td>XP*x</td>
</tr>
<tr>
<td>GERMAN</td>
<td>0.245</td>
<td>0.024</td>
</tr>
<tr>
<td>HUNGARIAN</td>
<td>0.505</td>
<td>0.090</td>
</tr>
<tr>
<td>IRISH</td>
<td>0.383</td>
<td>0.011</td>
</tr>
<tr>
<td>ITALIAN</td>
<td>0.51</td>
<td>0.087</td>
</tr>
<tr>
<td>POLISH</td>
<td>0.545</td>
<td>0.090</td>
</tr>
<tr>
<td>SLOVAK</td>
<td>0.487</td>
<td>0.061</td>
</tr>
<tr>
<td>MEAN</td>
<td>0.446</td>
<td>0.061</td>
</tr>
<tr>
<td>TOTAL POP.</td>
<td>0.685</td>
<td>0.226</td>
</tr>
</tbody>
</table>

The highest level of isolation or, conversely, the lowest level of exposure among the immigrant groups of Pittsburgh was that of the Italians, for which an xP*x value of 0.05 was calculated, followed closely by the Polish, with a value of 0.04. However, both
values are low and certainly do not indicate any appreciable amount of isolation. The Irish population produced the lowest \( xP^*x \) value (0.01). Looking at the results it is evident that there is little variation among the six study groups in Pittsburgh—all show low levels of isolation.

In Cleveland, the most isolated group in 1940 was the Polish, with an index of 0.09. Although it is more than double the highest index among Pittsburgh’s groups, a value of 0.09 still does not reflect isolation. As in Pittsburgh, the ethnic group in Cleveland to exhibit the lowest level of isolation was the Irish, for which the same value was calculated—0.01. Although the immigrant groups of Cleveland produced higher indices than Pittsburgh’s groups—the mean value in Cleveland was approximately twice the mean value in Pittsburgh—none of the indices indicate a notable amount of isolation.

Among Pittsburgh’s immigrants, the ethnic group with the highest concentration was the Irish with a delta of 0.79, whereas the most concentrated ethnic population in Cleveland was that of the Polish with a delta of 0.8. However, it is apparent that the total populations of both study areas show rather high levels of concentration. In 1940, far more people—both foreign-born and native—lived within the inner-city tracts, each comprising significantly less land area than the large but sparsely populated tracts in the outskirts of the two counties. In both Allegheny County and Cuyahoga County, the German-born population showed the lowest amount of concentration—nearly equal to the concentration of the total population. The difference between the value for the German group and the value for the total population in the Cleveland area is a mere 0.004.

As for clustering, the fourth and final dimension of segregation assessed in this study, the German immigrant population produced the greatest values in both Pittsburgh
and Cleveland, with Moran’s i values of 0.22 and 0.37, respectively. The least clustered immigrant group in both areas in 1940 was that of the Italians, with surprisingly similar Moran’s i values, 0.04 in Allegheny County and 0.09 in Cuyahoga County. Even more surprising is the fact that the Italians were the only ethnic group in 1940—in both study areas—to show such a pronounced deviation from the average Moran’s i value.

2000 Data

Analysis of 2000 Census data on ancestry revealed that among nearly all of the ethnic groups in both study areas, the levels of unevenness, concentration, and clustering were less than the levels in 1940—but isolation was actually greater. Although the overall trends are likely to be due to population growth, at least for isolation and clustering, any deviations from the trends can reveal important population characteristics that may be unique to specific ethnic groups and/or specific locations (Hoong-Sin, 2002).

In 2000, the ethnic group to show the greatest degree of unevenness in both Pittsburgh and Cleveland was that of the Slovaks, with IDs of 0.33 (Table 4.1) and 0.37 (Table 4.2), respectively. In Pittsburgh the Irish produced the lowest ID (0.15), whereas in Cleveland the Hungarians had the lowest value (0.28). Among the ID values calculated for the ethnic groups of Cleveland, there was far less variation than Pittsburgh’s groups. Moreover, the average ID of Cleveland’s groups (0.32) is significantly greater (with a p-value of \(0.0135\)) than that of Pittsburgh’s groups (0.23). In short, nearly all of the indices calculated for Cleveland’s European ethnic populations and two out of six indices of among Pittsburgh’s ethnic populations indicate moderate
levels of unevenness, which is surprising considering the length of time that the ethnic
groups have resided in the U.S.

In both counties, the German ethnic group showed the highest levels of isolation,
with xP*x values of 0.2 (Allegheny County) and 0.15 (Cuyahoga County), while the
Hungarian group showed the lowest levels, 0.02 (Allegheny County) and 0.03 (Cuyahoga
County). Because the Germans comprise the largest group in both metropolitan areas
while the Hungarian group is the smallest in Pittsburgh and the second smallest in
Cleveland, the pattern among isolation indices across the two study areas suggests that
group size may be an important factor in calculating xP*x. Research has shown that the
xP*x, unlike ID, is responsive to group size relative to the total population—that is,
groups that constitute a smaller proportion of the total population tend to produce smaller
isolation indices (Lieberson, 1981; Hoong-Sin, 2002). Moreover, the significant
increases in isolation among all study groups may reflect natural group population growth
since 1940.

In Pittsburgh the most concentrated ethnic population was the Hungarian, for
which a delta value of 0.48 was produced, while in Cleveland the Irish group was most
concentrated, with a value of 0.41. In both Allegheny County and Cuyahoga County the
Italian group was the least concentrated, with values of 0.41 and 0.35, respectively—
nearly equal to the concentrations of the counties’ total populations. There is little
variation among the values calculated in each study area. It is also worth noting that the
average delta value among the six groups in Pittsburgh is somewhat greater than in
Cleveland, which very likely reflects a similar difference between the concentrations of
each area’s total population. This distinction most likely reflects one of two (or both)
scenarios: (1) there is a greater difference between the smallest and largest tracts in Allegheny County than in Cuyahoga County or (2) Cuyahoga County’s total population is more evenly dispersed throughout the county.

In terms of population clustering, the Slovaks produced the largest Moran’s I value among the ethnic groups of Pittsburgh (0.217), whereas in Cleveland the Hungarian group produced the greatest value (0.221). The Slovaks produced the lowest value among Cleveland’s groups (0.18)—which is not much smaller than the highest value—while in Pittsburgh the lowest Moran’s i value calculated was that of the Italians (0.13). An important observation in the analysis of clustering is the fact that the Moran’s i calculated for the total population in Cleveland (0.23) is greater than any one of the values calculated for the six ethnic groups, while in Pittsburgh the Moran’s i value of the total population (0.098) is less than all of the group values. In fact, the Slovak group’s i value is more than twice the total population’s i value.

Interpretation of the Results

Ethnic Group Characteristics - 1940

Using the results of the calculations to briefly compare the ethnic groups as they existed in 1940, it is evident that the Germans showed the lowest levels of segregation in both study areas, with the exception of clustering. The low levels of segregation may be due to the fact that Germans began assimilating decades before most of the other groups arrived and their assimilation proceeded at a much faster rate than what might be
expected of a non-English-speaking immigrant group. The economic mobility of the German ethnic population, due to their high representation in skilled trades that paid much better than manual labor jobs, is probably the most influential aspect in terms of assimilation (Conzen, 1979).

Among Cuyahoga County’s ethnic groups the Germans actually showed the highest level of clustering in 1940. According to Conzen (1979), possible causes of ethnic neighborhood development among German immigrants include rapid migration, large populations, and relative prosperity compared to other immigrant groups. Assuming that the Pittsburgh’s Germans did, in fact, achieve such prosperity, it follows that the group’s socioeconomic assimilation will soon allow them to acquire the resources necessary for its members to relocate to areas of their choosing. While group members may not consciously choose to live in one specific area, they may in fact choose to not live in certain areas (Clark, 1992)—such as the inner-city districts where new immigrants seek low cost housing. Such a preference can in turn lead to residential patterns characterized by high “negative clustering” and low unevenness, isolation, and concentration, as seen with the Germans in the Cleveland metropolitan area in 1940 (Figure 4.1).

In Pittsburgh, the Irish showed relatively high levels of dissimilarity and concentration in 1940, although they also showed the lowest level of isolation. Looking at the density maps of foreign-born populations in Allegheny County in 1940 (Figure 4.2) it is evident that the Irish group was unlike any other in that it resided almost exclusively within the urban core of the county—the City of Pittsburgh—which helps to explain the higher level of concentration.
Figure 4.1 – Foreign-born population proportion – Cuyahoga County, 1940
Figure 4.2 – Foreign-born population proportion – Allegheny County, 1940
Although it is impossible to determine with certainty, it is likely that group preference was largely responsible for such high levels of segregation. The Irish immigrants and their offspring began the process of assimilation at a very early date and were aided by the fact that they were an English-speaking group. By the early 20th Century large-scale immigration from Ireland had long since ended—at least in comparison to the wave of new immigrants entering the U.S.—and by 1940 the majority of the Irish ethnic population most likely consisted of the American born children and grandchildren of Irish immigrants. As new immigrant groups began to occupy the unskilled labor niche formerly dominated by the old immigrants, the English-speaking, more experienced Irish workers moved into higher-paying skilled labor or management positions (Ward, 1989). Consequently, economic advancement led to greater freedom of choice in residence. Although the Irish ethnic population may have still remained somewhat marginalized in comparison to residents whose families had a longstanding presence in the community, group preference was nonetheless a contributing factor in creating the residential patterns of 1940.

Analysis of the 1940 data shows that in Cleveland, Polish immigrants experienced the greatest degree of segregation in all dimensions except clustering, for which the Germans had the highest value. Dot density and choropleth maps created at the tract level illustrate important spatial characteristics of ethnic distribution that are not apparent in the statistics but may nonetheless play a major role in calculating the statistics (Figures 4.1, 4.5, and 4.6). These characteristics include the number of different residential clusters for each group and their respective locations. The choropleth map of Cuyahoga
Figure 4.3 – Ethnic population distribution – Allegheny County, 1940 and 2000; German, Irish, and Italian groups
Figure 4.4 - Ethnic population distribution – Allegheny County, 1940 and 2000; Polish, Slovak, and Hungarian groups
Figure 4.5 - Ethnic population distribution – Cuyahoga County, 1940 and 2000; German, Irish, and Italian groups
Figure 4.6 - Ethnic population distribution – Cuyahoga County, 1940 and 2000; Polish, Slovak, and Hungarian groups
County’s ethnic group populations (Figure 4.6) reveals a very large population concentration in a south-central section of the City of Cleveland, consisting of two adjacent ethnic neighborhoods known as Warszawa and Krakowa as well as the nearby neighborhood of Kantowa (Figure 4.7; Grabowski, 1976).

Although the sizable concentration of Polish immigrants in several adjacent tracts of south Cleveland did not lead to a significant Moran’s I index of clustering, it was very likely an influential factor in producing the highest indices of dissimilarity, isolation, and concentration in Cuyahoga County. Unlike the other five groups analyzed, whose populations appear to have been distributed throughout enclaves located in different parts of the city, the majority of the Polish population was concentrated in two main areas. The largest area was the Warszawa-Krakowa-Kantowa cluster discussed above, but another major concentration consisted of the southwest-northeast oriented group of tracts between the ethnic communities of Josephatowa and Poznan (Grabowski, 1976).

Undoubtedly, the spatial characteristics of the Polish residential distribution of Cuyahoga County in 1940 were highly influential in producing such large segregation indices relative to the area’s other ethnic groups.

In both Pittsburgh and Cleveland, the Italians exhibited moderate levels of segregation across all dimensions except clustering, for which they produced rather low values. In fact, the Moran’s i values calculated for the Italian populations in both study areas are the only values that differ greatly from those produced for the two counties’ total populations. Thus, it is unlikely that the low values are a mere coincidence. While comprising a substantial immigrant population, the Italians appear to have been
Figure 4.7 – Ethnic enclaves in Cleveland, 1940
distributed throughout enclaves located in various sections of the two metropolitan areas (Figure 4.7). The concentration of Italian immigrants in several geographically dispersed communities with few immigrants living in areas between the different enclaves would lead to very low levels of clustering but would also permit moderate levels among the other dimensions of segregation.

For the remaining study groups in both metropolitan areas, the results varied greatly among the different measures of segregation and most likely reflect group population size more than any group-specific characteristics. Specifically, the Slovak and Hungarian groups exhibited relatively high levels of unevenness but rather low levels of isolation and concentration. Although the Slovaks produced the highest Moran’s i value among the groups in Pittsburgh and the Hungarians produced the highest value in Cleveland, the values are moderate at best. Although the two ethnic groups may have experienced some degree of segregation, whether it be out of preference or the result of other factors, their small populations relative to those of the other ethnic groups most likely played a significant role in the calculation of segregation indices—especially xP*x.

The comparison of inter-group residential patterns indicate that unevenness was greater between different ethnic groups in 1940 than it was between any individual ethnic group and the remaining population outside of the group (Tables 4.3 and 4.4). In the Pittsburgh area the highest degree of unevenness existed between the Germans and the Slovaks and the lowest between the Hungarians and the Slovaks.

In the Cleveland area the greatest difference was between the Hungarians and the Poles, which is surprising because both groups have similar cultural backgrounds and the
Table 4.3 – Inter-group dissimilarity indices in Allegheny County, 1940 and 2000

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Table 4.4 - Inter-group dissimilarity indices in Cuyahoga County, 1940 and 2000

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majority of group members held the same occupations in the same industries. Conversely, the smallest difference was between the Germans and the Irish, which is not so surprising, as both are old immigrant groups that have lived and interacted in the same areas since the mid-19th century.

*Ethnic Group Characteristics – 2000*

In review of the statistics calculated for the 2000 data set, the two study areas were quite mixed and no single ethnic group showed the highest or lowest levels of segregation across all dimensions. In both Allegheny County and Cuyahoga County the German ethnic group showed the greatest amounts of isolation and clustering; however, in both counties that group also showed the lowest levels of unevenness. In Allegheny County the delta value (of concentration) calculated for the German-American population was the closest to the value calculated for the total population, indicating that there is no single neighborhood, district, or tract in which a large percentage of the county’s total German ethnic population resides.

Examining the choropleth map of ethnic proportions in Allegheny County in 2000 (Figure 4.8), it is obvious that the German-American population comprises, by far, the largest proportion of any group in nearly every part of the county outside of the City of Pittsburgh. The dot density map of German ethnic distribution in Allegheny County (Figure 4.3) illustrates the dispersal of the German-American population throughout many different parts of the county, which explains the ethnic group’s low levels of dissimilarity and concentration.
The maps and statistics both suggest that in Cuyahoga County the German-American population is not as evenly distributed as it is in Allegheny County. Tract proportions are much higher in the outskirts of the county—especially in the western half—than they are in the urban core (Figure 4.9). Relatively high proportions in the suburban and rural areas coupled with very low proportions in the urban areas is most likely what led to the German ethnic group showing the highest levels of isolation and clustering in Cuyahoga County. In both study areas, the large size of the German-American population also contributes to the higher levels of isolation and clustering that exist due to the populations’ geographic distributions.

The map of census tract ethnic population proportions in Cuyahoga County in 2000 (Figure 4.9) shows that largest contiguous area in which there is an unusually small German ethnic proportion consists of the City of Cleveland and adjacent municipalities to the east. In fact, all six of the study groups in Cuyahoga County have negligible populations within the urban core when compared to the populations in neighboring suburbs. This phenomenon is plainly obvious in both proportion and dot density maps of the county’s ethnic distribution. In every map an area of low ethnic population density and proportion (shaped like the letter “V” rotated 90 degrees clockwise) is noticeable, extending from the center of the city into its eastern districts. The clustering of European ethnic populations in the suburban areas of Cuyahoga County leads to an average Moran’s I value that is much larger than the value calculated for the ethnic groups of Allegheny County.

Although not as clustered as the Germans, the Irish are more concentrated. Figures 4.5 and 4.9 reveal a large concentration of Irish-Americans in the western half of
Figure 4.8 – Ethnic group proportion – Allegheny County, 2000
Figure 4.9 – Ethnic group proportion – Cuyahoga County, 2000
Cuyahoga County, which can explain why the Irish group exhibited the highest delta value and second highest Moran’s I value. The Irish ethnic group, like the German group, is not as evenly distributed in Cuyahoga County as it is in Allegheny County. In the Cleveland metropolitan area the Irish-American population produced an ID of approximately 0.32—more than twice the ID calculated for that group in the Pittsburgh area—0.15.

In Pittsburgh the Hungarian ethnic group was nearly the opposite of the German group among the different dimensions of segregation. The Hungarian-American population produced the highest level of concentration in addition to a relatively high level of unevenness—second only to the Slovak-American population—although they showed the lowest levels of both isolation and clustering. The map of ethnic proportions in Figure 4.8 shows that although the Hungarian-Americans comprise a very small minority relative to the other study groups, they remain concentrated in the southeastern section of Allegheny County—in many of the same tracts in which significant numbers of Slovak-Americans reside.

The higher concentration of the Hungarian ethnic group in the southeastern tracts of Allegheny County at least partially explains the higher delta index, which is nonetheless not much higher than the delta index calculated for the total population—a difference of only 0.062. Because the Hungarians comprised the smallest of the six study groups in 2000, group size was likely to be major factor in calculating isolation and clustering, for which the Hungarian-Americans produced the lowest indices. However, looking at the dot density map of ethnic distribution in Allegheny County in 2000, it is clear that the Hungarian-American population is not by any means isolated in the
southeastern area of the county. Although there are noticeable ethnic clusters, members are scattered throughout most sections of the county. The same can be said of nearly all of the study groups in both study areas.

As in Allegheny County, the Hungarian ethnic group showed the lowest isolation in Cuyahoga County. Additionally, they produced the lowest ID among the six study groups. Although they constitute the largest Hungarian-American population in the U.S., the Hungarians of Cuyahoga County did not represent a significant proportion of the total population in any census tract, suggesting that the ethnic group is scattered throughout the metropolitan area.

Another ethnic group to exhibit relatively low levels of segregation in Cuyahoga County consists of the Italian-American population, for which the lowest delta and Moran’s I indices were calculated. Nonetheless, the choropleth map of Cuyahoga County shows a sizable distribution of Italian-American residents in the northeast part of the county, which comprises over 20 percent of the population in that specific area (Figure 4.9).

The greatest inter-group difference among the six ethnic populations in Pittsburgh in 2000 existed between the Slovaks and Germans, whereas the least difference was between the Irish and the Germans, two large old immigrant groups that have co-existed in the area much longer than the new immigrant groups. In Cleveland, the largest amount of unevenness was between the Polish and the Irish populations while the smallest amount was, as in Pittsburgh, between the Irish and the German. It is apparent that the greatest residential unevenness in either county exists between a Slavic group and a non-
Slavic group. On the other hand, the least inter-ethnic unevenness is associated, in both cases, between the two old immigrant groups.

Comparison of Residential Patterns in 1940 and 2000

Similar immigration and settlement patterns are evident in the history of the Pittsburgh and Cleveland areas. These general patterns include: (1) the arrival of a large population of working class immigrants from Northwestern Europe, prior to 1880, followed by those from Southern and Eastern Europe between 1880 and 1920, as well as (2) the settlement of these immigrants and their families in close proximity to employment centers—usually within or adjacent to the industrial districts of inner-city areas. In both study areas, most of the major employers of immigrants, including those from outside the U.S. as well as blacks from the South, were large steel and iron companies.

Because immigrants were forced to live within walking distance of the factories and mills where they were employed (Bodnar, 1982)—at least in areas where public transportation was either limited or nonexistent—ethnic enclaves were established primarily in inner-city districts. As sufficient numbers of nationality group members settled in the same neighborhoods, other ethnic institutions were built. Today, the original churches built by different nationality groups, representing a wide variety of denominations, still exist throughout Pittsburgh and Cleveland. Although many of the children and grandchildren of the original immigrants have since left the inner-city enclaves and migrated to outlying suburbs, national churches and other ethnic institutions
such as social clubs and fraternal organizations remain in the areas that were once ethnic neighborhoods.

In both Pittsburgh and Cleveland in 1940, the majority of each ethnic group population was concentrated in a few specific areas consisting of either one single tract or several adjacent tracts. Although some of the groups were more concentrated than others, no group was entirely concentrated within one single area. Additionally, at least a few members of each ethnic group lived outside of the primary settlement area, which certainly affects the outcome of a statistical analysis. Finally, no census tract was inhabited exclusively by a single ethnic group but was shared by several groups—with no group constituting a majority of the total population.

Barton (1975) describes the unique characteristics of three major ethnic communities in Cleveland: Italians, Romanians, and Slovaks. According to Barton, Italian communities were organized primarily by prominent leaders who ran businesses or professional practices, with kinship and family relationships being the strongest cohesive factor; for Romanians the leadership came from similar backgrounds with the clergy playing a “secondary role” (Barton, 1975: 76) in community organization; finally, Slovak communities were far different in that they were almost always centered around religious institutions, with few significant changes in structure of the ethnic community occurring throughout the early 20th century. As in Pittsburgh, the majority of the Slovak immigrants living in the Cleveland area were of either Roman Catholic or Lutheran denominations, with a few scattered Slovak Baptist and Congregational communities.

Analysis of tract-level census data from 1940 shows a correlation between Slovak residence and Slovak national church location (Fig. 4.10). Using sources pertaining to
Hungarian communities in Cleveland (Papp, 1981), similar analysis shows an even stronger correlation between Hungarian residence and church location. According to Pankuch (2001), national churches were built either within or in close proximity to areas of immigrant settlement. According to Schreuder (1989) the immigrant churches—as well as other institutions such as schools and fraternal aid associations—served to “anchor” residents to ethnic enclaves. An ethnic community itself as well as the ethnic institutions within that particular community would then attract new immigrants seeking residence in the metropolitan area, which would in turn lead to the growth of the enclave.

Although some ethnic groups produced moderately high indices of segregation in 1940, such as the Polish in Cuyahoga County, the residential patterns lack some of the important characteristics that indicate actual “segregation.” Specifically, no group constituted a majority within a single census tract in either study area. In 1940, the greatest ethnic group proportion in the tracts of Allegheny County consisted of immigrants from Czechoslovakia—approximately 17 percent—while in Cuyahoga County the greatest proportion was of Hungarians—33 percent. The smallest proportions were typically those of German, Irish, and Italian groups.

Thus, according to Boal’s (1999) definitions it can be said of the European ethnic groups that the overall residential pattern was one of pluralism, with patterns slightly more defined in Cuyahoga County. In both areas, the Germans were possibly already advanced to the stage of assimilation by 1940.

By 2000 the residential patterns of European ethnic groups had changed drastically in both study areas, although the changes were specific to each area. The situation that existed in Allegheny County can be described as a diffusion or dispersal
Figure 4.10 – Slovak and Hungarian national churches and ethnic enclaves, Cleveland, 1940 Data sources for church locations: Papp (1981); Pankuch (2001) (legend applies to both maps)
from the major ethnic concentrations that existed in 1940, with significant overlap of
ethnic distributions occurring in 2000. Some groups appear to overlap more than others,
especially the Italian and Irish groups, whose members reside in nearly every part of the
county.

On the other hand, some groups are not as widely scattered throughout the
metropolitan area, especially the three eastern European/Slavic groups, many of which
remain in the same tracts and districts in which their immigrant forebears lived. These
groups exhibit residential patterns that are too pronounced to be coincidental, and most
likely exist due to choice and not circumstance or external forces. Their residential
patterns lie somewhere along the spectrum of segregation between assimilation and
pluralism, and will probably continue to advance toward assimilation until no such
patterns remain evident.

Ward (1989) claims that in the past immigrants were certainly more segregated
than their descendants are today, although studies of several areas have shown higher
levels of ethnic clustering in suburban settings than what would normally be expected.
The residential patterns of 2000 uncovered through the statistical analysis of this study,
many of which are easily noticeable in the quantitative maps produced for the two
counties, serve to confirm Ward’s claim.

The old immigrants of Pittsburgh appear to have experienced the greatest degree
of structural assimilation. The German and Irish ethnic populations produced ID values
less than 0.2 in 2000 (Table 4.1), indicating that both groups are well distributed
throughout Allegheny County, with the exception of many inner-city tracts in which very
few, if any, German-Americans reside, although many of those areas are home to Irish-
Americans. Although the German and Irish ethnic communities of Pittsburgh and Cleveland may still be characterized by a limited amount of self-segregation, their growth and upward social mobility since the time of immigration has led to almost total structural assimilation in most sections of the two metropolitan areas. Both old immigrant populations represent their respective ethnic groups in almost all of the two counties’ residential areas.

In Cleveland, the difference between the residential patterns of 1940 and 2000 reflects a migration away from original urban areas of settlement and a re-establishment of neighborhoods in suburban areas, some of which are characterized by clearly defined ethnic similarity. Of course, one can easily argue whether the neighborhoods can still be accurately described as “ethnic,” let alone as ethnic enclaves. Looking at the maps of ethnic population mean centers in 1940 and 2000 (Figures 4.11 and 4.12), it is apparent that the movement was much greater for each group in Cleveland than in Pittsburgh—which supports the conclusion that changes in the distribution of Cleveland’s European ethnic groups are characterized by migration as opposed to dispersal.

In Allegheny County the mean center changes—including that of the total white population—are all approximately one mile. All groups show a movement to the west, closer to the center of the county, which can be interpreted in one of two ways. First, it could mean that group populations have actually migrated to the center of the county. However, the data has shown that none of the groups live exclusively in the center of Allegheny County—the City of Pittsburgh—and that the group proportions in that area are actually quite low. This leads to the second interpretation, that groups that were once located in specific sections of Allegheny County have experienced an overall dispersal.
Figure 4.11 – Change in ethnic population mean centers – Allegheny County, 1940 and 2000
Figure 4.12 – Change in ethnic population mean centers – Cuyahoga County, 1940 and 2000
throughout various sections of the county, bringing the mean centers of the group populations toward the center of the county. The Italian and Polish group mean centers are relatively close to the white mean center, whereas the Hungarian and Slovak mean centers remain much farther to the east.

In Cuyahoga County, on the other hand, the average mean center change is much greater, between 3.5 and 5 miles, and each of the group mean centers changes position in the same direction. In Allegheny County all of the group mean center changes were around 1 mile or slightly less, while in Cuyahoga County the least movement was 3.7 miles and the greatest movement was 4.8 miles. It appears that the Hungarian-American population mean center shifted slightly less than the mean center of the white population as a whole (approximately 4 miles) while the other ethnic group mean centers shifted more than that of the white population.

It is apparent that major intra-county migration occurred in the Cleveland area and it is likely that the presence of a larger African-American population (in addition to a substantial Hispanic population) in Cleveland led to a “white flight” type of migration. This assumption could logically explain the “negative clustering” that some of the European ethnic groups exhibit. Also, migration into middle and upper class suburban neighborhoods with competitive housing markets may account for the relatively high degrees of unevenness and clustering exhibited by many of the European groups.

Figures 4.13 and 4.14 show ternary histograms (unweighted) of census subdivision population proportions for three mutually exclusive groups in Allegheny County and Cuyahoga County, respectively. The groups consist of non-white people, white people affiliated with at least one of the six European ethnic groups that are the
Figure 4.13 – Ternary histogram of selected ethnic/racial groups in Allegheny County by census subdivision, 2000

Figure 4.14 – Ternary histogram of selected ethnic/racial groups in Cuyahoga County by census subdivision, 2000
focus of this study, and all other white people. Although there are more than twice as many census subdivisions in Allegheny County than there are in Cuyahoga County (130 and 58, respectively), the two histograms reveal similar population characteristics. This racial/ethnic breakdown shows that the majority of each area’s census divisions are populated by a mix of white residents who identify with one of the six major European ethnic groups and white residents not affiliated with any of those groups, with a small minority of non-white residents.

However, one difference between the two areas is that the main cluster of points in the histogram of Allegheny County is centered approximately half way between group A—the “study group” population—and group B—the “other” population, whereas the main cluster in the Cuyahoga County histogram is located slightly closer to the group A. It appears that most of the subdivisions in the Pittsburgh area are inhabited by populations that consist of 30 to 50 percent of group A, 30 to 50 percent of group B, and less than 20 percent of group C—the “non-white” population. As the proportion of non-white group increases in various census divisions, the proportions of the two white groups remain nearly equal to each other, with a slightly higher proportion of those who are affiliated with a major ethnic group, as indicated by the dashed line bisecting the dot pattern.

In the Cleveland area, on the other hand, most subdivision populations are comprised of 50 to 60 percent of group A, 35 to 45 percent of group B, and less than 10 percent of group C. There is much more variation in the ethnic/racial subdivision populations in Cuyahoga County than in Allegheny County, with values scattered
throughout a larger area of the ternary histogram. Specifically, there are more subdivisions with higher proportions of the non-white population in Cuyahoga County.

As the proportion of non-white residents increases, there tends to be a higher proportion of the white non-study group population than the white study group population, indicating that the six ethnic groups are less mixed with the non-white population in Cuyahoga County than they are in Allegheny County. Many of the subdivisions with a greater percentage of non-white residents are in the urban core of Cuyahoga County, which may explain the greater propensity for suburban residence among the six study groups.

The suburban migration that appears to have occurred in the Cleveland metropolitan area would have been less likely in Pittsburgh, due to the fact that a substantial portion of the county developed at an early date along the three rivers because of the influence of industry (Muller, 2003). Thus, much of the county was heavily urbanized by 1940, including many of the smaller cities and boroughs that were home to the expanding iron and steel industries, such as McKeesport, Duquesne, Clairton, Homestead, and Braddock. With little physical space available for expansion, intra-county migration was limited. Also, it is highly probable that the hilly topography, as well as the numerous rivers and streams, acted as natural neighborhood boundaries and barriers to the encroachment of outsiders (Bodnar, 1982; Muller, 2003).

Every individual ethnic group in each of the two study areas exhibited unique differences between their respective residential patterns of 1940 and 2000. In both Allegheny County and Cuyahoga County, the Polish quite possibly showed the greatest amount of structural assimilation, beginning as one of the most segregated European
immigrant groups and being among the least segregated ethnic/ancestral groups 60 years later. The Italians also exhibited drastic decreases across all dimensions of segregation, becoming rather well assimilated by 2000. Their fellow countrymen in Pittsburgh had been among the least segregated groups in 1940 and in 2000 remained a fairly well integrated ethnic population.

In both counties the residents of Slovak ancestry are today one of the least structurally-integrated white ethnic groups. However, the values calculated for the ancestry group with the 2000 data set indicate a pattern of segregation no more severe than pluralism (Boal, 1999). Along with the Slovaks, the Hungarian residents of Pittsburgh exhibit degrees of unevenness and concentration that are greater than what would be expected by an ethnic group with a presence in the U.S. for such a long period of time. It is prudent to consider the possibility that smaller groups tend to show higher levels of segregation not only because of the influence of group size on many measures of segregation but also because social pressures might act more strongly on small populations.

On the other hand, the Hungarian-American citizens of Cleveland and nearby municipalities appear to have experienced a greater degree of assimilation than in the Pittsburgh area. However—as with every other group in both study areas—the level of clustering exhibited by the Hungarian group in 2000 was much greater than the level in 1940. This may be largely due to the natural growth of ethnic populations. However, the possibility that many members of ethnic groups that are financially able to live in nearly any neighborhood may continue to prefer living among people with similar cultural backgrounds cannot be discounted.
Conclusions Regarding the Hypotheses

After conducting this study, it is evident that segregated ethnic enclaves no longer exist in the Pittsburgh and Cleveland metropolitan areas or they exist as very small neighborhoods that can only be identified through analysis performed at the block or even household level. However, it may be the case that European ethnic populations were never truly segregated in the past—at least not to the same extent as many of America’s other ethnic and racial minorities that remain segregated today.

Analysis revealed that in 1940 the six European ethnic groups in Pittsburgh exhibited residential patterns similar to the same groups in Cleveland, in terms of segregation levels. Groups that displayed the most similar residential patterns between the two study areas were the Germans, who showed low levels of unevenness, isolation, and concentration with high levels of clustering in both Allegheny County and Cuyahoga County and the Italians, who showed remarkably low levels of clustering—far lower than any of the other groups—in both counties.

On the other hand, the residential patterns that existed in 2000 were unique and very much specific to their respective urban environments, although some general
characteristics appeared in the same groups in both study areas. Specifically, the eastern European populations tended to produce higher indices of dissimilarity, as they did in 1940, and the German ethnic group showed relatively high levels of isolation and clustering.

There is no occurrence of high levels of segregation across all four dimensions among any of the six study groups in Pittsburgh in 2000 to imply the existence of a traditional ethnic enclave. Furthermore, members of all groups reside in nearly every section of the county, which shows that some individuals who identify with a particular ancestry are able and willing to live in areas where there are very few other individuals of the same ethnic background. However, we cannot rightly assume that assimilation has occurred among all of the descendants of European immigrants to the point that a relationship between ethnicity and residence no longer exists. In fact, the occasional segregation indices greater than 0.3 as well as the variation in values from one group to another are enough to prove that ethnicity still exerts influence on residence, albeit a small influence in most cases.

After analyzing the historic residential patterns of ethnic groups in Pittsburgh and Cleveland in 1940, it is clear that segregated ethnic enclaves either did not exist at that time or that they were much smaller than the average census tract and therefore not noticeable in the analysis. Although it is evident in the statistical results and the maps created that specific ethnic groups tended to gravitate toward specific areas, the amount of inter-ethnic co-residence that occurred in almost every tract is enough to discount the possibility of “true” segregation. Without a clear majority of an individual ethnic group
in any of the census tracts of either study area, the residential patterns that existed in Allegheny County and Cuyahoga County can be described as pluralism.

The statistical analysis of Cuyahoga County’s European ethnic groups in 2000 reveals a different scenario than that which existed in Allegheny County in 2000. As mentioned earlier, no single group exhibited high levels across all dimensions; however, the moderately high indices of segregation and clustering suggest that contemporary ethnic residential patterns are stronger in Cleveland than Pittsburgh. Also, the small amount of variation among the statistics calculated for the Cleveland study groups shows that the residential patterns of different ethnic groups may have similar characteristics (one, among many, is the existence of negative clustering). Despite the fact that patterns are stronger in Cleveland, they are still not strong enough to suggest the existence of modern ethnic enclaves.

The drastic differences in the residential patterns of the European ethnic groups of Cleveland between 1940 and 2000, namely the widespread suburban migration, did not occur to the same degree in Pittsburgh. In fact, the difference between the two study areas is great enough to support the hypothesis that structural assimilation is unique to the specific urban area in which it occurs.

Finally, it is probably safe to assume that the assimilation of European ethnic or nationality groups will continue to occur at a steady rate as inter-group marriage occurs and the significance of ethnic identification begins to wane. This, however, does not deny the importance of measuring structural assimilation via ethnic residential patterns, which reveals a continual relationship between ethnicity and place of residence. Although residential segregation is usually the strongest with racial or ethnic minorities

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that are easily identifiable because of their skin color or facial structure, it is certainly not limited to those groups alone. Segregation exists as a spectrum ranging from complete integration to complete segregation and thorough research can usually determine where a population’s residential patterns fit along this spectrum.

Future Research

There are numerous future research opportunities pertaining to ethnic and racial residential patterns, especially in light of the continuing advancement of GIS technology. Massive amounts of data can today be processed in a few hours or even minutes, which may have taken days of painstaking calculations only ten years ago. Social scientists now have at their disposal more resources to discover geographic patterns in the multitude of socioeconomic population data that is currently available. Moreover, researchers can further quantify the patterns that are already known to exist but whose significance is underestimated or even ignored—specifically racial segregation in American cities.

The analysis of residential patterns, including segregation, can be conducted on a variety of different scales for any particular area of interest. Unfortunately, there are instances when the options in scale are quite limited, especially when using census data. Some data is only available at a certain level, including the data on ancestry, which is available at an enumeration unit level no smaller than the census tract. For a more in-depth study of racial segregation, statistical methods similar to those employed in this study could be applied to data collected at the block level, which would account for
neighborhood patterns that might be overlooked by a tract-level analysis. On the other hand, a tract-level analysis for a state or even the entire country could lead to important findings. Again, with technological advancements more data can be processed in relatively short periods of time. Other future research could also include multiple scales in one study, such as census tract, subdivision, or block. Such research could also involve an analysis of patterns that differ from one scale to another and whether such differences are related to methods or actual demographic characteristics.

Research could be conducted at a variety of different scales to assess the relationship between boundary delineation and segregation, based on the assumption that some political boundaries are drawn to separate specific areas based on differences in class, race, or ethnicity. In such cases the effect of the boundary increases the amount of structural segregation.

Future research can also include more in-depth temporal analyses. Using two dates sixty years apart only allows for the difference between the two years and not any changes or fluctuations in data at different times. Analyzing the difference was sufficient for this study but it is preferable to select at least one census between the earliest and the latest censuses analyzed. For a more detailed study of changes in ethnic residential patterns, data can be collected from subsequent decennial censuses or even ever other census over a given time period (i.e. – 1940, 1960, 1980, 2000).

Additionally, different methods of assessing segregation other than the traditional segregation indices (or even more complex spatial measures) can be utilized, including proportion threshold-type methodologies. After conducting this analysis and interpretation, it seems that many of the traditional structural measures cannot be
accurately interpreted unless a comparison of multiple groups or study areas is being made. Even then, judging the degree of difference between numerical values in terms of what they are to represent in the real world remains a difficult process. Analyzing residential patterns by classifying areal units based on group population proportion thresholds or percentage intervals may prove to be more practical and useful. In addition to quantitative choropleth and dot density mapping, different methods of visualizing population distributions, such as the weighted ternary histogram (Plewe, 2001), can be utilized. Unique and original methodologies, although they may not be as time-tested as traditional approaches, may be able to overcome the limitations of those traditional approaches, clearing a path for better research and new discoveries.


U.S. Census Bureau. 2000 Census, S.F. 3, Table PCT16.


