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POSITIVE IMPACTS OF RACIAL DIVERSITY ON VARIOUS MEASURES OF QUALITY OF LIFE IN U.S. METROPOLITAN AREAS

By

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ABSTRACT

POSITIVE IMPACTS OF RACIAL DIVERSITY ON VARIOUS MEASURES OF QUALITY OF LIFE IN U.S. METROPOLITAN AREAS

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Racial diversity indices have been used to examine the distribution and segregation of minority populations within metropolitan areas. Quality of life indices have identified and measured the social welfare of populations within these urban areas. In the last two decades, numerous studies have investigated each type of index but only a few studies were designed to examine the relationship between racial diversity and quality of life. Springing from a hypothesis that an increase in racial diversity will result in an improvement in quality of life, my study used multiple linear regression modeling to investigate the effects of a diverse urban population on measures of quality of life. These quality of life measures included an economic, housing, social, and aggregate component. The hypothesized relationship between racial diversity and quality of life was not found to be significant. Several trends suggested that a more ethnically diverse community has a positive influence on certain aspects of quality of life.

Dedicated to Russell and Bernice Crampton, and Paul and Ida Fahrenkrog, who worked so hard to ensure that following generations could pursue their own interests.

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CHAPTER ONE

Introduction and Literature Review

Race, income, household size, and other demographic characteristics form the basis of segregation in American residential neighborhoods. A growing share of minorities is changing the ethnic composition of the population in the United States and the term 'racial diversity' is being heard with increasing frequency. Various academic disciplines have their own interpretation of the term 'diversity', which results in ambiguous and overlapping definitions. Recent studies by urban geographers and sociologists have focused on the impacts of racial composition and diversity measures within spatial areas (Dahmann 1985; Myers 1987; Blomquist et al.1988; Abramson et al.1995; Baldassare and Wilson 1995). While much of the literature still focuses on aspects of segregation, the most modern investigations focus on the relationships between racial diversity and the economic condition of communities and people in our society (Darden 1987; Massey and Denton 1988, 1988a; Houghton and Mukerjee 1995; Chakravorty 1996; Coulton et al. 1996).

Sociologists and human geographers have been introducing new ideas for quantifying and measuring the status of members of society. Two of these concepts include rating occupations in the work force and ranking education attainment levels. These methods have created a variety of variables and indices for use in constructing a valid and reliable "social indicator." Beginning in the mid- 1960's, various attempts have been made to convince government policy makers of the importance of social indicators just as they have accepted the importance of economic indicators (McVeigh and Dedekind 1995).

Recent studies illustrate the importance of including both economic and social indicators when determining the quality of life for a group of people (Burnell and Galster 1992; Stover and Leven 1992). For example, a recent study conducted at the University of Illinois revealed that a person's overall quality of life improves with that person's proximity to trees or other greenery (Sullivan et al. 1997). Therefore, planting trees in neighborhoods can help to improve the quality of life for society. Conclusions of this type increase the likelihood that social welfare research and reform programs will continue to be helpful. Examples of social welfare components that impact quality of life include the crime rate, accessibility to public transportation, job availability, and access to parks and hospitals (Savageau and Loftus 1997).

Statement of Problem

Stover and Leven (1992) suggest that knowledge of the relationship between *racial diversity* and *quality of life* might shed insight into some of the problems that plague American cities. While an increasing number of studies have begun to investigate each of the two concepts (Baldassare and Wilson 1995; Haughton and Mukerjee 1995), limited research has examined the interactions between them. McVeigh and Dedekind (1995) have briefly examined this relationship. In an attempt to measure the degree and extent of parity between whites and blacks in the office space from 1980 -1990, these authors explore the interrelations between diversity and quality by utilizing Social Indicators and a Dissimilarity Index. Their results focus on important aspects of economic welfare and demonstrate the progress made towards increasing adult education and training programs. The interrelations between racial diversity and quality of life serve as a stepping stone in this study.

Housing policy makers, local government, and city administrators are not always able to understand and assess the complex nature of racial diversity issues and quality of life factors using the conclusions from former studies. In addition to the complexities of the two concepts, racial diversity and quality of life measures vary across urban areas and between cities. Therefore, comprehensive research that examines the impacts of both diversity and quality of life is still needed. There are numerous studies that focus on the lower quality of life associated with the concentration of certain ethnic groups (Darden 1987; Massey and Denton 1989; Miller 1990; Bickford and Massey 1991; Waldorf 1993; Denton 1994; Fong 1994; Abramson et al. 1995). In this research project, I will focus on examining the improvements of quality of life, which may be attributed to an increase in the racial diversity among American cities.

Does a more racially diverse environment result in a better quality of life? Do humans benefit from exposure to cultures other than their own? These questions are controversial and emotional subjects throughout the world. Here in the United States, we hear various opinions in the about whether or not the classroom climate has improved with increased diversity and "parents' choice" in the schools their children attend. Another example of the emotional force behind diversity issues is the heated debate about books such as The Bell Curve (Herrnstein 1994). There will always be critics claiming that integration and diversity have negative effects on society. However, more people will counter with arguments that learning about and sharing different cultures is a benefit that all citizens can gain from.

Exposure to another race often serves as a catalyst to the acceptance of others. This attribute can be advantageous throughout one's life and professional career. From colleges to the workplace, the acceptance of a member from another ethnic background is essential to the morale of the "whole." While the United States still has many racial issues to work on, it benefits from having members of almost every nation in the world as citizens. Many Americans have members of different cultures as neighbors, which is especially evident in the metropolitan areas of the country.

New York City, Chicago, and Los Angeles serve as cultural centers for the whole USA. In these places, racial identity and cultural traditions almost always overlap and are often shared amongst members of communities. A culturally - conscious person most likely not only accepts members of other racial groups, but often notices when certain cultural influences are lacking or missing from a neighborhood or city. For example, people who have enjoyed living in a northeastern metropolitan area of the United States may have difficulty moving to a smaller city or town. The lack of ethnic restaurants and absence of cultural centers would be very obvious to those accustomed to this variety of social opportunities in a larger city.

Sometimes, however, the exact opposite situation arises. Throughout the sixties and seventies, the term "white flight" described the millions of people who left American cities. Many studies indicate that the majority of these people left the urban areas because they felt threatened by the increasing African American, Hispanic, and Asian populations. The people who "fled" felt there was no benefit or inherent gain from exposure to a member of another racial group (Darden 1987; Massey and Denton 1988a; Ginsburg 1990; Bickford and Massey 1991; Massey and Denton 1991; Fong 1994).

The duality of the race issue poses some intriguing questions. Does racial diversity effect one's quality of life? What is the extent of this relationship? Are the effects of racial diversity limited to any particular aspect of quality of life? Through the expansion of the ideas and techniques of previous studies, the current research will add to the geographic literature in this area and examine these questions and issues in detail.

Statement of Purpose

Over the last three decades, policy makers of American cities have been struggling with issues pertaining to race and the quality of life. Volumes of research literature exist regarding segregation, racial parity, social indicators, housing quality, and quality of life during this period of time. Recently, it has become important to eliminate segregation between communities while simultaneously working to maintain a high quality of life in cities. The present study examines the influence of an urban area's racial diversity on the quality of life of its populace using tools and quantitative indices derived in previous research.

The purpose of this research is to determine if any relationships exist between racial diversity and the quality of life in urban areas. A second more precise purpose is to determine if an increased amount of diversity adds to a measurable increase in quality of life. One popular method for establishing and examining these types of relationships is through multiple linear regression modeling. Under normal conditions a functional relationship is considered linear when pairs of X and Y values fall into a pattern that is best depicted by a straight line. Hence, we get the linear model:

$$Y = a + b_1X_1 \quad \textbf{(Equ. 1.1)}$$

where:
Y= dependent variable
X= independent variable
a = Y intercept
b = partial coefficient

However, the relationship between racial diversity and quality of life is likely not linear. Initial regressions that were run in a previous research project I conducted between both groups in Detroit, MI indicated the lack of any marked linear trend. Hence, quality of life might be a function of not one but several aspects of racial diversity.

When considering the relationship between racial diversity and quality of life numerous conditions might exist. Often the highest quality of life values are found in affluent, majority white areas, and the lowest conditions are found in minority ghettos. One might also expect that the relationship in areas with varying proportions of both racial groups would fall somewhere between these other two. If we imagine this relationship as a curve (Figure 1.1) an initial decline is seen until a minimal quality of life value is achieved. However, it is unlikely that the quality of life score will remain at the bottom of the curve. This study hypothesizes that some of the inherent benefits that accompany a racially diverse area will help create a relationship curve that shows that quality of life also increases as racial diversity does. In the figure, this relationship will be represented by the upswing in the curve resulting in a distinctive "U" shape.

This study expects to find a curvilinear relationship between racial diversity and quality of life, and that to an extent, an increase in racial diversity will add to the quality

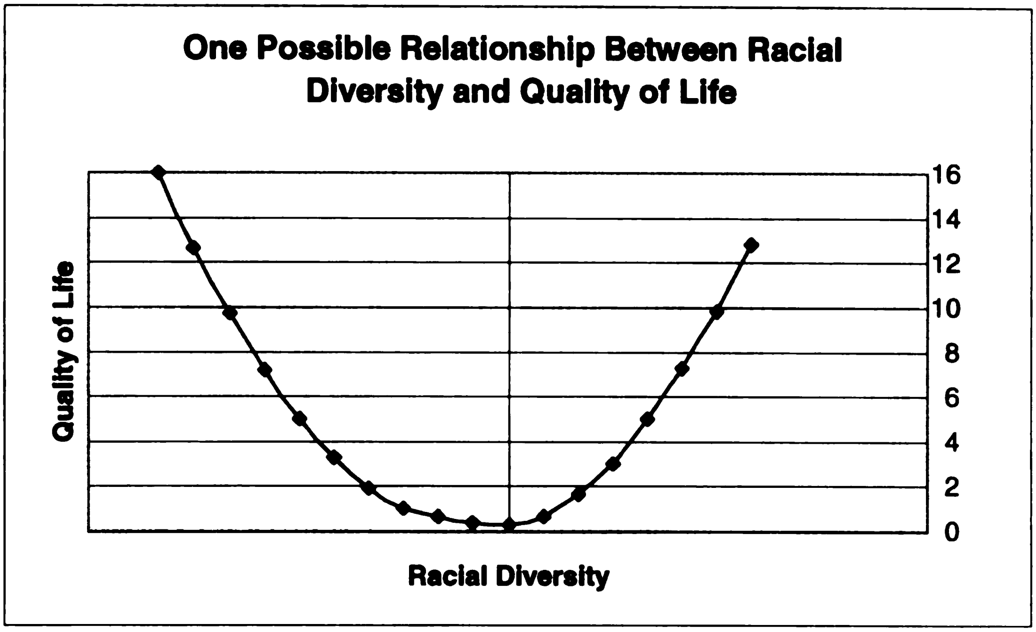


Figure 1.1 - Hypothesized Relationship between Racial Diversity and Quality of Life

of life of that population. I expect to see an initial decline in quality of life, however the curvilinear hypothesis accounts for the upward swing or eventual improvement in quality of life I am anticipating. By hypothesizing this increase, this study expects to find a second order polynomial relationship between racial diversity and quality of life.

In order to examine the expected curvilinear relationship a multiple regression model must be used. Such that,

$$Y = a + bX_i + cX_i^2, \qquad \textbf{(Equ. 1.2)}$$

where:
Y = dependent variable
X = independent variable
a = constant (Y interval)
b = partial coefficient (b parameter)
c = partial coefficient (c parameter)

In this case quality of life is used as the dependent variable Y and racial diversity is the independent variable X. The parameters can be estimated by the least squares method in a multiple regression model.

In these relationships the b parameter measures the rate of change in quality of life at the origin. This partial coefficient can take on negative, zero, or positive values, and consequently enables the representation of all possible changes in the quality of life near the origin. The c parameter indicates the degree of curvature of the quality of life surface. If b is positive and c is positive, the quality of life curve will be similar to the shape indicated in the upper left corner of Figure 1.2 (Latham and Yeates 1970). Whether or not this second order is present and is significant will be the test of my research hypothesis.

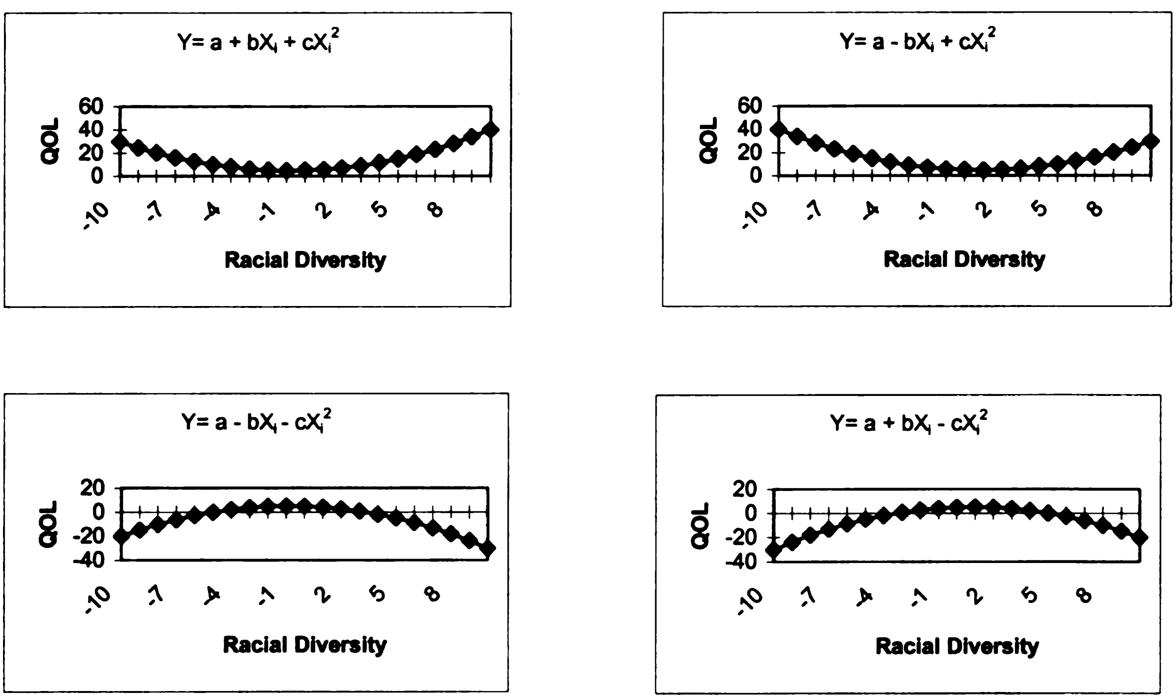


Figure 1.2 – The Influence of a Change in the Values of the *c* Parameters on the Shape of the Quadratic Curve.

CHAPTER TWO

Racial Diversity in Metropolitan Statistical Areas

Quantifying racial diversity in an urban area includes many factors. Obviously, the initial observation is the percentage of minority residents compared to the total population of the city or metropolitan area. In addition to the total population amount, the actual physical size and layout of the area being studied will provide a significant influence.

The location or distribution of minorities throughout a given city has a great impact on the interaction between various ethnic groups. Large and/or small clusters of minority residents and their relation to the center of the city are another important factor in the identification process. In many older cities, neighborhoods adjacent to the downtown area are densely populated with minorities. While the close proximity to the city center is in one sense a positive factor, it is negated due to poorly maintained and overcrowded housing. In contrast, many cities are experiencing renewal of neighborhoods surrounding the central core. Racial and ethnic diversity in these renewed neighborhoods will be assessed when the next US census is taken.

Because racial segregation or diversity is a multi-dimensional phenomenon that is best measured by a battery of indices rather than one. Over twenty measures for segregation are available; this study will utilize the five best known measures (Table 2.1). This decision is based upon a previous study that ran a principle components analysis on all 20 segregation measures and determined the five most influential and reliable measures (Massey and Denton 1988). These five indices each measure a different dimension of racial diversity. The values for each diversity index have been calculated by the U.S. Census Bureau for each Metropolitan Statistical Area, and are recalculated every 5 years (U.S. Census Bureau, 1997). This study uses the pre-calculated 1990 values for 5 different indices, obtained from Roderick Harrison at the US Census Bureau. Three of the five MSA diversity indices are aggregate measures calculated by combining the census tract unit values for each city.

The first dimension, *evenness*, refers to each city having the same proportion of a minority group as the nation as a whole. The index chosen to measure this dimension of racial diversity is the *index of dissimilarity*,

$$D = \sum_{i=1}^{n} \frac{t_i |p_i - P|}{2TP(1-P)},$$

(Equ. 2.1)

Where:

t_i = total population of areal unit (MSA) i
p_i = total minority proportion of areal unit (MSA) i
T = total population size of the study area (US)
P = total minority proportion of the study area (US)
n = number of areal units

This equation measures the departure from evenness by taking the weighted mean absolute deviation of every unit's minority proportion from the MSA's minority proportion, and expressing this quantity as a proportion of its theoretical maximum (James & Taeuber 1985). Conceptually, the index of dissimilarity measures the proportion of minorities that would have to change their area of residence to achieve a uniform population distribution in a specific area.

In this index, the number of minority members moving are expressed as a proportion of the number that would have to move under conditions of total segregation (Harrison and Weinberg 1992). The index ranges from 0.0 to 1.0. On this scale a 0.0 represents minimum levels of segregation or a highly diverse community or city. A score of 1.0 represents an extremely segregated metro area with very low levels of diversity.

The second dimension, *exposure*, "measures the degree of potential contact, or possibility of interaction, between minority and majority group members" (Massey and Denton 1988). Exposure is dependent upon the extent to which two groups share common residential areas, and hence on the degree to which the average minority group member encounters segregation. The most widely used and recognized measure of *exposure* is the isolation index,

$$P^*_x = \Sigma^n_{i=1} [x_i / X][x_i / t_i] \qquad \textbf{(Equ. 2.2)}$$

where:

t_i = total population of areal unit i
x_i = total minority population of areal unit i
X = total minority population of study area
n = number of areal units

Unlike the dissimilarity index that examines proportions, the isolation index focuses on probability. This index reflects the probabilities that a minority person lives in the same residential area as a majority person (Harrison and Weinberg 1992). My study uses the isolation index to measure the lack of exposure the four minority groups have to other inhabitants in each city. The isolation index measures the amount to which minority members are exposed only to one another, and is calculated as the minority – weighted average of the minority proportion in each area. On this scale that also ranges from 0.0 to

1.0, a low score represents a low level of segregation or a high level of diversity. A high score would reflect a city with a low level of diversity.

The third diversity dimension, *concentration*, refers to the relative amount of physical space occupied by a minority group or groups in the metropolitan area. Minority groups of the same relative size occupying less space would be considered more concentrated and consequently more segregated. To measure this dimension the study uses the relative concentration index:

(Equ. 2.3)

$$RCO = \{[\Sigma^{n}_{i=1}(x_i a_i/X)]/[\Sigma^{n}_{i=1}(y_i a_i/Y)] - 1\}/\{[\Sigma^{n}_{i=1}(t_i a_i/T_1)]/[\Sigma^{n}_{i=n2}(t_i a_i/T_2)]-1\}$$

where:

a_i = land area of unit I
n = number of areal units
n_1 = rank size of the MSA where the cumulative total population of areal units equals the total minority population of the study area
n_2 = rank of the MSA where the cumulative total population of units equals the minority population totaling from the largest MSA down
t_i = total population of area i
T_1 = total population of units from 1 to n_1
T_2 = total population of units from n_2 to n
x_i = total number of minority members in unit i
X = total number of minority members in study area
y_i = total number of majority members in unit i
Y = total number of majority members in study area

This index takes the ratio of X minority members' to Y majority members' concentration and compares it with the maximum possible ratio that would be obtained if X were maximally concentrated and Y minimally concentrated, standardizing the quotient so that the index varies between negative one (-1.0) and one (1.0). A score of zero (0) means that the two groups are equally concentrated in urban space. A score of –1.0 means that Y's concentration exceeds X's to the maximum extent possible, and a score of 1.0 means the converse. The relative concentration index (RCO) measures the share of urban space occupied by group X compared to group Y (Massey and Denton 1988, p. 291.).

The fourth dimension, *centralization*, refers to the proximity a racial group's population has to the central business district or downtown area. As previously mentioned, in many older and larger urban areas, much of the housing surrounding the downtown area is rundown, and neglected. It is often considered disadvantageous to live in these areas; as a result, minorities because of the poor infrastructure often inhabit centralized areas. The index chosen for measuring centralization is the absolute centralization index,

$$ACE = (\Sigma^{n}_{i=1} X_{i-1}A_i) - (\Sigma^{n}_{i=1} X_iA_{i-1}) \qquad \textbf{(Equ. 2.4)}$$

where:

A_i = the cumulative proportion of land area through unit i
X_i = the cumulative proportions of minorities in unit i
n = number of areal units

> An absolute centralization index measures a group's spatial distribution compared to the distribution of land area around the city center. The areal units are ordered by increasing distance from the central business district and A_i refers to the cumulative proportion of land area through unit i (Massey and Denton 1988, p. 291).

Varying between –1.0 and 1.0, the absolute centralization index examines only the distribution of the minority group around the downtown area. Positive values of this index suggest a tendency for minority group members to reside close to the city center, while negative values indicate a tendency to live in outlying suburbs (Harrison and Weinberg 1992). On this index a score close to 0.0 would indicate an even distribution of a racial group throughout a city, or a high level of uniformity.

The fifth and final dimension, *clustering*, addresses the issue of contiguity among a minority group's neighborhoods. To calculate this measure, one must first estimate the average proximity between members of the same group, and between members of different groups. The average proximity between group X members can be approximated by:

$$P_{xx} = \Sigma^{n}_{i=1} \Sigma^{n}_{j=1} x_i y_j c_{ij}/X^2 \qquad \textbf{(Equ. 2.5)}$$

while the average proximity between members of X and Y is estimated as:

$$P_{xy} = \Sigma^{n}_{i=1} \Sigma^{n}_{j=1} x_i y_j c_{ij}/XY \qquad \textbf{(Equ. 2.6)}$$

Here, the average proximities between Y members (P_{xy}) and among all members of the population (P_{tt}) are calculated by analogy with Equation 2.5. The index of spatial proximity is the average of intra-group proximities, P_{xx}/P_{tt} and P_{xy}/P_{tt}, weighted by the fraction of each group in the population:

$$SP = (XP_{xx} + YP_{xy})/TP_{tt} \qquad \textbf{(Equ. 2.7)}$$

where:

XP_{xx} = average weighted proximity between minority members
YP_{xy} = average weighted proximity between majority and minority members
TP_{tt} = average weighted proximity among all members of the population

The spatial proximity index (SPC) measures what can be thought of as the checkerboard problem: diversity is negatively impacted if red squares are adjacent to other red squares while black squares are similarly grouped together. If neighborhoods are individually segregated but are mixed up like the squares on a checkerboard like alternating black and red squares, diversity is improved. Integration and interaction between racial groups in the entire metropolitan area are more difficult for people living in a large, contiguous ghetto, rather than in an isolated neighborhood (Denton 1994).

According to White's (1986) index of spatial proximity, the average intragroup clustering index for the minority and majority populations results from a weighted proportion of each group in the total population. Spatial proximity equals 1.0 if there is no differential clustering between minority and majority group members. The index is greater than 1.0 when members of each group live nearer to one another than to members of the other group. If minority and majority members lived nearer to members of the other group than to members of their own group, then the index is less than 1.0 (Harrison and Weinberg 1992). For this measure, a low score represents a more diverse metropolitan area.

Table 2.1 – Measures and Dimensions of Racial Diversity.

INDEX	*DIMENSION*	*FORMULA*
Dissimilarity (DIS)	Evenness	$D = \sum_{i=1}^{n} \frac{t_i \lvert p_i - P \rvert}{2TP(1-P)}$
Isolation (ISO)	Isolation	$ISO = \Sigma^{n}_{i=1} (x_i / X) * (y_i / t_i)$
Spatial proximity (SPC)	Clustering	$SPC = (XP_{xx} + Yp_{yy}) / TP_{tt}$
Relative Concentration (RCO)	Concentration	$RCO = \frac{[(\Sigma x\, a_i/X) / (\Sigma y\, a_i/Y)] - 1}{[(\Sigma t\, a_i/T_1) / (\Sigma t\, a_i/T_2)] - 1}$
Absolute Centralization (ACE)	Centralization	$ACE = (\Sigma X_{i-1} A_i) - (\Sigma X_i A_{i-1})$

Symbols:

x_i = number of members of group x in MSA i.
y_i = number of members of group y in MSA i.
X= metropolitan-wide total number of members of group X.
Y= metropolitan-wide total number of members of group Y.
t_i= total population of area i.
T_i= total population of MSA.
a_i= area, in square miles, of area i.
A_i= total area, in square miles, of MSA.
P_{xx} and P_{yy} and P_{tt} refer to average proximity between groups x, y, and t.

CHAPTER THREE

Quality of Life in Metropolitan Statistical Areas

As in identifying racial diversity, assessing the quality of life in an urban community is a complex study involving a multitude of factors. Complicating the study are variables that are difficult to compare on an equal basis. For example, median family income is a factor that relates to all areas whereas climate does not. Greatly influencing lifestyle, climate varies among and within most cities.

Size of a city impacts life quality in a number of ways (see ch.2). Cities of large population may contain sizable clusters of impoverished and environmentally depressed areas. At the same time, these large cities may provide cultural amenities accessible to low-income residents that would not be available in smaller communities. The number of automobiles per family is often considered a positive economic factor that may indicate a good transportation network. However, jammed expressways causing commuting delays and carbon monoxide pollution is a serious negative factor. An efficient public transportation network is a positive quality of life factor for all income levels.

Median family income is the economic standard of quality of life in an urban area. However, quality of life must be thoroughly analyzed in a manner similar to that utilized in determining racial diversity in MSAs (see chapter 2). Type and condition of housing assert a major influence on a city's inhabitant's, life quality. Housing characteristics, like economic factors, can be compared to those of urban areas everywhere. As such, variables associated with economic quality and housing quality are listed as two of the three special groups or components for quality of life as it pertains to this study. The third component is comprised of social quality of life measures that includes variables relating to health, climate, education, transportation, culture, recreation, etc.

The data for the quality of life measurements came from three sources: the 1990 US Census Bureau report on Social and Economic Characteristics for Metropolitan Areas, the 1990 US Census Bureau report of Detailed Housing Characteristics for Metropolitan Areas, and the 1990 Places Rated Almanac (Savageau and Loftus, 1993). The quality of life variables were selected based upon the availability of the data at the MSA level and their use in previous studies of economic/social geography. In McVeigh and Dedekind's study (1995), 106 variables of social description and racial parity demonstrated that certain measures are better at distinguishing different aspects of quality of life. Several of the variables the authors found to be highly reliable in their study have been used here, including: Labor Force Participation, Unemployment Rate, Families Below Poverty Level, Exposure to Crime, Median Family Income, and Access to Education and Health Care. The present study utilizes 27 variables that were available at the MSA level.

Economic Quality of Life (EQOL)

The quality of life variables were developed in three groups. The first group, 'economic quality of life,' was made up of six variables (Table 3.1) that reveal various economic characteristics of the inhabitants of the MSAs.

"Median Family Income" (MFI) and "Percentage Families Below Poverty" (FBP) were chosen because they indicate different aspects of economic well being. MFI represents the median dollar income per family for a given MSA, while FBP is a

Table 3.1 – Economic Variables and their Influence on Quality of Life.

Variables	*Influence*
1. Median Family Income (MFI)	Positive (+)
2. % Families Below Poverty Level (FBP)	Negative (-)
3. % Persons 16 and over in Labor Force (PLF)	Positive (+)
4. % Persons Unemployed (PUE)	Negative (-)
5. % Persons Graduated from High School or GED (PGH)	Positive (+)
6. % Persons Attaining their Bachelors Degree (PBG)	Positive (+)

percentage of the total population in each MSA that is below poverty level. The distinction between measures of these variables is important because a low median family income does not necessarily mean that it is below the national poverty level or vice-versa.

The variables "Percentage Persons 16 and over in Labor Force" (PLF) and "Percentage Persons Unemployed" (PUE) were used in order to examine the strengths and weaknesses of the labor situation within each MSA.

The last two variables examine the educational backgrounds within the MSAs. These factors, Percentage Persons having Graduated from High School or Equivalence Degree (PGH) and Percentage Persons having attained their Bachelors Degree (PBG), are predictors of the economic benefits attributed to higher education. For example, a high school graduate may have an advantage over someone who does not have a high school diploma. The same reasoning applies for the advantages of obtaining a University degree.

Housing Quality of Life (HQOL)

The second quality of life component is based on housing characteristics. Housing plays a large role in the quality of life of a city's inhabitants (Denton and Massey 1991; Sufian 1993; Lawrence 1995). The present study uses eight housing variables to define housing quality.

Table 3.2 – Housing Variables and their Influence on Quality of Life.

Variables	*Influence*
1. % Living in Different House than in 1985 (PDH)	Positive (+)
2. % Housing Units that are Condominiums (PUC)	Positive (+)
3. % of Housing lacking complete Plumbing Facilities (HLP)	Negative (-)
4. % of Housing lacking complete Kitchen Facilities (HLK)	Negative (-)
5. Median Year the Housing Structure was Built (YSB)	Positive (+)
6. Median Monthly costs (in Dollars) with Mortgage (MCM)	Negative (-)
7. Median Monthly costs (in Dollars) not Mortgaged (MCN)	Negative (-)
8. Median Gross Rent (in Dollars) (MGR)	Negative (-)

While some correlation exists between the housing and economic quality of life variables, the eight housing variables measure distinctly different conditions in a person's quality of life. For example, the quality of a person's housing is in part dependent upon their income, but it is also reliant upon housing availability.

In metropolitan areas, both the rate of 'recycling' of available units and the type of units available are important housing factors. Housing built more recently is considered a positive indicator of an area's growth. In order to capture these aspects of housing quality, the variables "Percentage of People living in Different Housing than in 1985"

(PDH), "Percent Units that are Condominiums" (PUC), and the "Median Year the Housing Structure was Built" (YSB), were chosen.

Two detrimental aspects of housing quality included in this study are the "Percentage of Housing Units that Lack Complete Plumbing" or "Kitchen Facilities" (HLP and HLK). The presence of these facilities is generally considered important to maintaining optimal living conditions; housing with complete facilities may promote better personal hygiene and attention to nutrition - factors that indicate a higher quality of life.

Three median cost measures were utilized to examine housing costs for homeowners and renters in the metropolitan areas: "Median Monthly Owner Costs with Mortgage" (MCM), "Median Monthly Owner Costs Not Mortgaged" (MCN), and "Median Gross Rent" (MGR). These variables indicate the demand for housing within the MSAs as well as its affordability.

Social Quality of Life (SQOL)

The final quality of life component is 'social welfare.' This group is composed of thirteen different social factors that reflect quality of life (Table 3.3). Six of these focus on the social characteristics of the population of the metro areas. The other eight variables examine characteristics of the cities themselves and how they affect a person's quality of life in that area. By including the social dimensions for both the metropolitan areas and the populations, this component thoroughly examines numerous aspects of social quality of life.

The first five population variables were obtained from the U.S. Census Bureau – (Social and Economic characteristics). "Percentage of Persons Without a Telephone" (PWT) was selected as an indicator of quality of life because communication is essential in modern society. Whether someone uses the phone for an emergency or to use a dial-in server for the Internet, the telephone has been, and will continue to be, an important instrument for outside contact.

Table 3.3 – Social Variables and their Influence on Quality of Life.

Variables	*Influence*
1. % of Persons without a Telephone (PWT)	Negative (-)
2. % of Persons using Public Transportation (PPT)	Positive (+)
3. Mean Travel Time to Work (TTW)	Negative (-)
4. % of Persons age 18-24 at a College or University (PEC)	Positive (+)
5. % of Persons under age 18 Living with two Parents (PLP)	Positive (+)
6. Access to Various Methods of Transportation (MT)	Positive (+)
7. Access to Various types of Employment (MJ)	Positive (+)
8. Access to Secondary and Higher Education (ME)	Positive (+)
9. Exposure to Various Climate Conditions (MCL)	Positive (+)
10. Exposure to Various types of Crime (MCR)	Negative (-)
11. Access to Culture and the Arts (MA)	Positive (+)
12. Access to Various types of Healthcare (MH)	Positive (+)
13. Access to Lakes, Parks, and Recreational Activities (MR)	Positive (+)

"Percentage of Persons who use Public Transportation in a metro area" (PPT) often reveals whether an inhabitant must endure traffic to get to work. In addition, numerous city areas have carbon monoxide problems. Hence, the use of public transportation can positively influence a person's quality of life in more than one way. Another commuting variable included is the Mean Travel Time to Work (TTW). This measure is the average travel time it takes a city resident to get to work from the front door of their home. A longer travel time has a negative impact or influence on the quality of life because people consider their time to be valuable.

The next two variables help depict the social quality of life for children and young adults within an urban area. The Percentage of Eighteen to Twenty-four years olds Enrolled in a College or University (PEC) does a good job of explaining how well prepared this age group will be educationally. Another important aspect of childhood is the Percentage of Children Under the Age of Eighteen that are Living with Two Parents (PLP). With both parents present in a household, role models of both genders can add a sense of "self-security" as well as have a positive influence on a child's quality of life.

The next eight variables for social quality of life were taken from the Places Rated Almanac (Savageau and Loftus 1993). The data for these eight variables have already been collected and calculated by the authors. The raw data are unavailable, but the Places Rated Almanac scores are widely used for research purposes and are therefore deemed acceptable for use in this thesis. These variables are composite measures because they combine several quality of life characteristics to make one aggregate score. Rather than incorporating information from a particular characteristic of the population, these measures focus on the resources each metropolitan area has to offer its residents. The methodology used by Savageau and Loftus rates each metropolitan area using 50 aggregate variables from their own research in 1990 or in 1993. They rank each area's quality of life score by summing the ordinal rankings over the nine categories, which include cost of living, transportation, job availability, higher education, climate, crime, the arts, health care, and recreation. The present study did not use the Places Rated variable entitled 'cost of living' because several of the variables used to create that category were already used in this study's economic quality of life component. To avoid collinearity between variables, this category was omitted. What follows is a brief description of each of the eight variables and how Savageau and Loftus created the metropolitan statistical scores.

Although these aggregate variables are deemed acceptable and widely used in quality of life research, several urban geographers and sociologists argue that the methods Savageau and Loftus use to calculate these measures are biased. For example, in their article "Quality of Life Measurements and Urban Size: An Empirical Note," James Burnell and George Galster (1992) suggest that certain social amenities and disamenities are often associated with city size. Their main criticism towards Savageau and Loftus' method centers on the use of the *ad hoc* weighting scheme that may bias the rankings since they may not reflect the actual value or importance the residents place on the quality of life components. In addition, Burnell and Galster are critical of the appropriateness and reliability of some of the variables chosen to measure the quality of life components. Their main concern is that the methodology biases the quality-of-life scores to favor larger areas.

Although Burnell and Galster's (1992) concerns are valid and well argued, they shouldn't apply to this research project. The first reason their argument doesn't pertain to this paper is that since Burnell and Galster's article, Savageau and Loftus (1993) made a concerted effort to address these issues, and improve their '*ad hoc*' weighting scheme. In addition, my research project will group the metropolitan areas examined into four population categories to guard against a "big city bias. What follows is a brief description of each of the eight variables and how Savageau and Loftus created the metropolitan statistical scores.

To determine a transportation measure (MT) for each urban area, the authors take three broad factors into consideration. The first factor is the overall connectivity of the city to other areas. This portion is calculated from the number of non-stop jet and commuter airline destinations from that city, as well as the number of passenger rail departures from that area. These measures help determine the access, and options, a person living in a metro area has for traveling to another city. The second part of the transportation score is the commuting involved for the metro area's inhabitants. The transit revenue miles and the average time (in minutes) it takes to get to and from work is used to construct this factor. The third part of the transportation score is the centrality of the metropolitan area. This is a measurement that examines one metro area's proximity to all other US metro areas; a combination of latitude and longitude measurements, the distance connecting cities by national highways, and passenger rail directions are included.

Savageau and Loftus (1993) weight all three transportation factors differently, based on what they feel is more important. Connectivity constitutes for 60 percent of the final score, while commute and centrality make up for the other 30 and 10 percent, respectively. The sum of these weighted scores for each metro area is then normalized such that the 50^{th} percentile point is the mean for all metro areas (Savageau and Loftus, 1993). For instance, the authors indicate that the MT variable for Chicago, Illinois was ranked number one among all metro areas with a score of 98.92, indicating that the people who live in Chicago have a high quality of life when it comes to transportation.

The next variable chosen from the Places Rated Almanac for use in the present study was Jobs (MJ). This variable examines the near-future job growth rates for each metro area and evaluates the prospects for future employment in that area, which is a major quality of life factor for a city's population. Two criteria are used here to create this score: the percent increase in new jobs by the year 2000, and the total number of new jobs created between now and that date.

> In the case of jobs, factor analysis assigns a weight of 74 percent to number of new jobs and 26 percent to percent growth. A metro area's final score is its percentile on a scale of 0 to 100 corresponding to its weighted average scores for new jobs and for percent growth. Atlanta, Georgia's score is 100 and New York City, New York's is 0.00. They are respectively the best and worst US metro areas for jobs between now and the millenium (Savageau and Loftus 1993, p.109.).

The Education (ME) value measures the opportunities for higher education available to residents of a given area. Because it reveals how many options an individual has for pursuing or continuing a higher education, ME is an important aspect of an area's social quality of life. To obtain the higher education score, two major criteria are used. The first, 'college town,' is the collegiate enrollment weighted by number of typical attendance years needed to get the highest degree offered (i.e. Associate degree = 2, baccalaureate by 4, comprehensive by 6 and doctoral enrollment by 9.) This number is then divided by the city's population to get the 'college town' score (Ibid., 134.) The other ME component is 'available institution,' or the total number of institutions at any level that are available in each metropolitan area. The 'college town' and 'available institution' details are combined through a differential weighting procedure that uses one-third of 'college town' and two-thirds for 'available institutions' to produce the final score. All of the overall ME scores are then normalized such that the 50^{th} percentile is the average. A high score denotes an area's educational options past high school; lower scores indicate fewer options for an area's residents (Ibid., 134.)

The Climate (MCL) category is clearly not a social variable itself, but the physicalclimate of a metropolitan area does have an impact on a person's social quality of life. This variable considers how various weather elements and climatic conditions influence quality of life. This variable contends that a better climate results in a better quality of life. Twelve data elements were used to calculate the MCL: monthly maximum and minimum temperatures, wind speeds, humidity, darkness, clear days, and precipitation in the form of rain and snow. Savageau and Loftus (1993) reduce this weather information into three general parameters. Winter wind-chill temperatures, summer humidity levels and other discomfort descriptors created the "mildness" parameter. "Brightness," which embraces the number of clear days and wet days mediated by latitude, is an indicator of potential sunlight in the area. The third factor is "stability" which incorporates weather extremes such as thunderstorms, snow accumulation, and the difference between summer and winter mean temperatures. To get a final score, the scores for mildness, brightness and stability in each area were weighted by their relative importance. A metro area's final score is its percentile on a scale of 0 to 100 corresponding to its weighted average (Savageau and Loftus, 1993).

Among all previous urban studies, crime (MCR) is unanimously considered to have a major negative influence on a city's quality of life (Johnston 1988; Burnell and Galster 1990; Stover and Leven 1992; Fong 1994; McVeigh and Dedekind 1994; Baldassare and Wilson 1995). In the present study, this variable was used to indicate the level of both personal and property safety in each city. To create a score for this factor, Savageau and

Loftus (1993) averaged the rates for violent and property crimes for the last five years for each metro area. The overall 'violent crime rate' is a combination of the murder, robbery, and aggravated assault rate. Because property crime is considered less threatening to human nature than crime against people, property crimes are given one-tenth the weight of violent personal crimes in the calculation of this category. The 'property crime rate' includes the rates for burglary, larceny-theft, and motor vehicle theft. The sum of the property and violent crime rates were scaled against a standard where the average sum for all metro areas is set at 50. Cities with lower crime rates than the metro area average earned standard scores higher than 50. Likewise, places with higher crime rates than the average get standard scores lower than 50. In other words, if a city received a high score for MCR, then its inhabitants are exposed to more crime.

The "renaissance" flavor, or positive enlightenment, in a city is often attributed to exposure to culture and the arts. Savageau and Loftus (1993), using 14 different descriptors of the formal cultural aspects of each city created an Arts variable (MA). The analysis resulted in three broad components: bigness, reading popularity, and museum popularity. The first of these three components, 'bigness,' takes into consideration the number of art museums, the total museum attendance, the number of dance and theatrical performances (such as ballet, touring artists, operas, and symphony performances), as well as the number of people served by libraries, the total library books, and the total library circulation. The second component, 'reading popularity', is made up of the percent of total population served by libraries, the number of library books per capita, and the library circulation per capita. 'Museum popularity' measures per capita museum attendance as an indicator of the attractiveness of that city's culture. To arrive at a final number, each city's scores for bigness, reading popularity, and museum popularity are weighted by their relative importance. The score for each metro area is its percentile on a scale from 0 to 100, corresponding with its weighted average. New York City's score is 100 while Las Vegas, Nevada's score is 0.00 which are respectively the best and worst scores for (MA) in US metropolitan areas.

The access people have to health care is another very important aspect of quality of life. Health (MH) was selected from the Places Rated Almanac to measure the availability and choice of medical facilities the residents have in a given city. Five criteria are used to rate the supply of health care in a metro area on a per capita basis: the numbers of general / family practitioners, medical specialists, surgical specialists, short-term general hospital beds, and hospitals with physician teaching programs certified by the AMA. The size of the patient base generally reflects the type of physicians who practice in an area. Typically, residents of a city with a larger population have better access to medical specialists. In smaller metropolitan areas, general / family practitioners are usually the primary health care providers, while in larger cities, the medical specialists per 100,000 people (such as specialists in specific medical disciplines such as pediatrics or cardiovascular diseases) are more common. In addition, the number of surgical specialists per 100,000 people would reflect greater access to surgery (based on the number of physicians operating regularly in a given week).

The number of hospitals in a city that earn accreditation by the Joint Commission on Accreditation of Healthcare Organizations indicates the quality of health care in a community. The number of beds located in each facility that is accredited is also a reliable indicator of medical accessibility in a city. While the lack of accreditation doesn't necessarily mean that a facility is substandard, the presence of such accreditation demonstrates that the hospital has passed rigorous and periodic reviews. Because of cost-containment policies in health care and the shift towards outpatient services, bed availability still reflects a city's health-care supply, even though the number of hospital beds is dropping throughout North America.

Another component to the MH category is the size of the local physician residency programs. This measure is the number general hospitals that have approved physician-training programs. Institutions without teaching programs aren't necessarily lagging in quality, but facilities with such programs tend to be larger urban hospitals where the interaction between students and faculty encourages the development and use of the latest techniques, equipment, and therapy.

A total score for MH comes from standardizing and combining the totals from all five factors. The final measures are then scaled against a standard where the average sum for all metro areas is set at 50. A low score in (MH) indicates that the health care emphasis in the particular city is probably centered on basic health care which would indicate that the latest techniques, equipment, and personnel trained to implement new advances in health care are most likely to be found elsewhere.

The final social variable used from the Places Rated Almanac in this study is Recreation (MR). Quality of life is certainly affected by the options and quantity of recreational activities available in a metropolitan area. Recreation opportunities that are accessible during evening hours and on weekends reflect how leisure time can be spent. In order to measure the quantity of activities available to each resident twelve recreational elements were examined and grouped into three clusters. One is called 'common denominators' and includes the number of public golf holes, movie screens, and restaurant quality stars, including per capita measures of each of these. A cluster entitled 'crowd pleasers' accounted for seats for major and minor-league professional sports games as well as seats for college sports home games. The last cluster, 'outdoor assets,' includes the number of acres of protected recreation land as a percent of total land area, protected land area per capita, circumference of inland lakes, and the length of ocean or Great Lakes coastlines. Using factor analysis, Savageau and Loftus (1993) were able to separate the clustered groups to produce a score for each metro area on each of the three parts. These scores were then weighted by their relative importance, 'bigness' at 60 percent, 'recreation land' at 22 percent and golf/movies/good food per capita at 18 percent. A city's final MR score is its percentile on a scale of 0 to 100 corresponding to its weighted average.

CHAPTER FOUR

Methods and Procedures

This study focuses on 288 major Metropolitan Statistical Areas (MSAs) designated by the US Census Bureau (Figure 4.1). The areas were selected to include as many United States cities as possible with populations over 50,000 people. This requirement guarantees that the sample size would be more than adequate and ensures the inclusion of areas with varying and diverse ethnic populations. In addition, this study required data

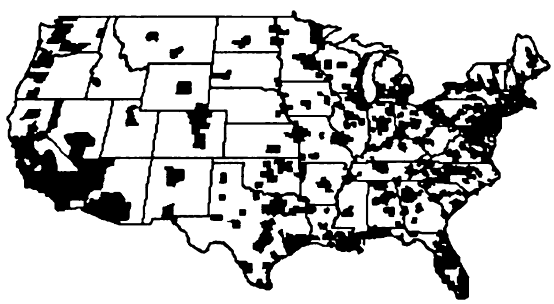


Figure 4.1 – Map of the United States and the 288 Metropolitan Statistical Areas used in this Study.

that documented the racial diversity of these U.S. cities. These data were collected from the U.S. Bureau of the Census for Housing, and are available for four minority groups classified as Native Americans, Asians and Pacific Islanders, African Americans, and Hispanics. The study examines all four minority groups' diversity, and that diversity's impact on the quality of life in the 288 metropolitan areas.

In the study, transforming the aforementioned data into normalized z-scores created four quality of life indices. The z-scores were calculated for each of the quality of life variables by measuring the difference between the mean of each variable and the raw scores for each MSA. The resulting number was then divided by the standard deviation of that variable which produces the z-score for that variable and MSA. For this project the z-scores were first calculated for all 288 metropolitan areas, then grouped into the four population groups. The relative value of the resulting z-score depends upon the index. For instance, one assumes that the higher an urban area's median family income is, the better the economic conditions are within that city. As a result, the indices *Median Income*, and *Labor Force* were considered "positive" indicators. The variables *% Families Below Poverty* and *% Unemployment* were both considered "negative" indicators, because higher rates of poor families or unemployed reflects a lower quality of life. To ensure that the distributions correspond with the other "positive" variables, the z-scores of "negative" indicators were multiplied by (–1.0).

The z-scores for the economic, housing, and social variables were totaled and divided by the number of variables to yield a mean number. The resulting values were then summed to create an over-all quality of life index value for each variable. The fourth quality of life index, an aggregate total of all the quality of life z-scores for each MSA, is intended to reflect the overall quality of life of residents in each city. For all four categories, a high score represented a high quality of life while a low score illustrated a poor quality of life.

The next step was to break the 288 metropolitan statistical areas into four population size groups (Table 4.1). This helps guard against comparing the larger cities with small ones. This is important because the big urban areas often have larger minority populations, a larger volume of housing units, and also receive more social funding from the federal government. In addition, most people living in larger metro areas have more cultural amenities and social qualities than people living in smaller urban areas do. For these reasons the study breaks down the metropolitan areas into groups that are comparable in size.

Table 4.1 – Metropolitan Statistical Area Population Categories.

MSA Category	Example MSA	Populations
Group one	Chicago, IL	600,000 – 8,000,000 (+)
Group two	Lansing / East Lansing, MI	260,000 – 599,999
Group three	Champaign / Urbana, IL	142,193 – 259,999
Group four	Bangor, ME	56,735 – 142,192

In order to group the cities by size, I rank transformed the variable 'Population.' The ranking created four categories and each contained 72 metropolitan areas. The first group contains the major U.S. cities with populations over six hundred thousand people. This division is made up of the largest metropolitan areas including the "big three:" Los Angeles, New York City, and Chicago. The second group is made up of metro areas with populations between 260,000 and 590,000. This category includes metro areas similar in size to El Paso, Texas or Lansing/East Lansing, Michigan. The third group is made up of cities with populations similar to Reno, Nevada or Champaign / Urbana, Illinois. These urban areas all have residents within the 140,000 to 259,000 ranges. The last category, group four, contains the smaller metropolitan areas of the US. These cities have populations between fifty thousand and one hundred and thirty nine thousand people. Examples within this group are Kenosha, Wisconsin and Bangor, Maine.

Table 4.2 summarizes the four essential factors used in the analysis, including 289 MSAs split into four population groups, five racial diversity measures for each of the four minority groups, and four different quality of life indexes.

Table 4.2 – Four Data Groups used in the Analysis.

Population Group	**Minority Groups**	**Racial Diversity Measure**	**Quality of Life Measure**
One	Native Americans	Dissimilarity	Economic QOL
Two	Asians	Isolation	Housing QOL
Three	African Americans	Relative Concentration	Social QOL
Four	Hispanics	Absolute Centralization	Total QOL (Aggregate)
		Spatial Clustering	

In order to test the hypotheses stated, this study uses the multiple regression equation:

$$Y_j = a + bX_j + cX_j^2. \qquad \textbf{(Equ. 4.1)}$$

where:
Y =dependent variable – Quality of Life
X =independent variable – Racial Diversity
a =Y intercept – constant
b = b parameter – rate of change in Quality of Life
c = c parameter – degree of curvature of Quality of Life parabola

This formula implies that Y is dependent upon a variable X in a non-linear fashion. The parameters of this non-linear relationship can be estimated with traditional least squares regression. The Y intercept, a is the value of Y when both X_1 and X_2 are zero or when $|bXj| - |cXj| = 0$.

A more specific way to express the formula used for the analysis in this study is the equation:

$$W_k = a_{kij} + b_{kij}I_{ij} + c_{kij}IS_{ij} \qquad \textbf{(Equ. 4.2)}$$

where:
W = dependent variable for quality of life
I = independent variable for racial diversity
IS = independent variable for racial diversity squared (I^2)
a = W intercept
b = partial regression coefficient
c = partial regression coefficient
i = minority group (Native American, Asians, African Americans, and Hispanics)
j = diversity index (dissimilarity, isolation, concentration, centralization, clustering)
k = quality of life index type (economic, housing, social, aggregate total)

These slight adjustments account for the parameters used in the multiple regression analysis. Thus, this study examines 320 multiple regression equations. (4 quality of life measures * 5 racial diversity index measures * 4 minority groups * 4 population groups = 320.) For example, examine the first multiple regression model used for this study:

$$EQOL = a + b(NADIS) + c(NADIS*NADIS). \qquad \textbf{(Equ. 4.3)}$$

Here (EQOL), or economic quality of life, is the dependent variable. The independent variable (NADIS), or the Native American dissimilarity index, is essentially used twice - first with the partial coefficient b, and then its value is squared for the partial coefficient c. This particular equation is executed for all four population groups. Since curvilinear regression equations involve the terms X and X^2, plotting the resulting curve will result in a parabola. Generally as the power of X increases, the curve becomes more and more complex and usually fits a given set of data increasingly well.

This study hypothesizes that the relationship between racial diversity X and the quality of life Y is curvilinear. In essence, this working model attempts to capture the upward or downward turn in Y and the quality of life at the maximum or minimum value of X.

The polynomial regressions for this study were all done within the multivariate general linear hypothesis (MGLH) statistics section in SYSTAT©. The output from each multiple regression included the coefficient of the constant as well as the partial regression coefficients bX and cX^2. The output from SYSTAT© (Table 4.4) also records the T-test value for the coefficients, as well as the P values for the equations to check for significance. The confidence interval for these calculations was done at the 95% level for a two-tailed test.

Table 4.3 – Sample SYSTAT© Printout of a Quadratic Regression with Economic Quality of Life (EQOL) as Dependent Y, and Native American Racial Diversity Dissimilarity Index (NADIS) as X and (NADISSQ) as X^2.

Sample SYSTAT© Printout

DEP VAR: ECQOL N: 72 MULTIPLE R: 0.163 SQUARED MULTIPLE R: 0.027
ADJUSTED SQUARED MULTIPLE R: .000 STANDARD ERROR OF ESTIMATE: 3.551

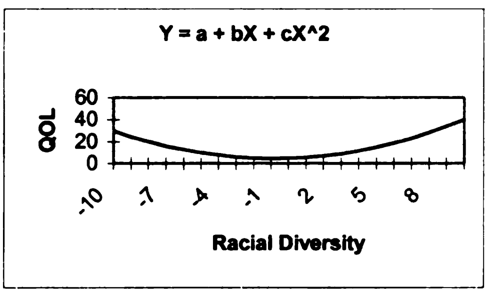
VARIABLE	COEFFICIENT	STD ERROR	STD COEF	TOLERANCE	T	P(2 TAIL)
CONSTANT	-4.859	5.041	0.000	.	-0.964	0.338
NADIS	34.768	25.369	0.987	0.027	1.371	0.175
NADISSQ	-41.045	29.984	-0.986	0.027	-1.369	0.175

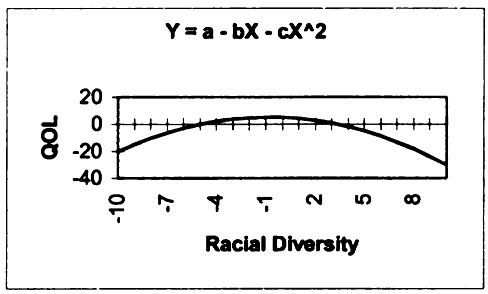
ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	23.826	2	11.913	0.945	0.394
RESIDUAL	870.222	69	12.612		

Examination of the significance of the three coefficients is important. This study specifically predicts that all three coefficients will be significant at a two-tail 95 percent confidence interval. If only a and b are significant, then the result is a straight line. If only a and c are significant, the result is a curved line. However, if a, b, and c are all significant then the study confirms the presence of a parabolic relationship between quality of life and racial diversity.

The shape and 'direction' of this parabola depends upon the value (positive or negative) of the c coefficient value. If c is positive as shown in Figure 4.2, the parabola will be "convex downwards" or "U – shaped"(∪). If the c parameter is negative in value the resulting shape of the parabola will be "convex upwards" or "bell-shaped (∩)" (Figure 4.3).





Figures 4.2 and 4.3 – Influence of the (c – Parameter) on the Shape of the Resulting Parabola.

To further examine the parameters and the resulting parabolas, the maximum or minimum values of Y_i must be determined. In a quadratic regression, if the coefficient is negative, then there will be a maximum value. If c is positive, there will be a minimum value. The maximum or minimum value of a quadratic equation is at the following value of the independent variable:

$$X_0 = -b / 2c. \qquad \textbf{(Equ. 4.4)}$$

By placing (X_0) in the quadratic equation (Equ. 4.1) we can see that:

$$Y_0 = a - (b^2 / 4c) \qquad \textbf{(Equ. 4.5)}$$

Once the maximum or minimum value of Y_i is determined, the corresponding value of X_i can be found (Zar 1996). These values help identify the direction and shape of the parabolas (See Appendix B).

The hypotheses for this study are set up in the following manner. If any of the three coefficients in the multiple regression equations are found to be insignificant then the null hypothesis H_0 (no relationship exists) is accepted, and that specific relationship is declared non-conclusive. If all three coefficients are found to be significant, and the minimum or maximum Y value indicates that either a "U" (∪) or "bell-shaped" (∩) relationship exists, the research hypothesis H_1 will be accepted and the relationship will be deemed a reliable indicator. These assumptions provide a conservative yet comprehensive set of decision rules regarding the relationship between quality of life and racial diversity.

In addition, this study expects the shape of the significant parabolas to be convex-downwards (∪). This is anticipated because the 5 indexes for racial diversity (Dissimilarity, Isolation, Relative Concentration, Absolute Centralization, and Spatial Clustering) all have index ranges that indicate a decrease in diversity as the scores become higher. As mentioned earlier, this study expects to see an initial decline in quality of life but as racial diversity levels among urban areas increase; the "U-shaped" parabola will represent the improvement in quality of life or "upswing" in the curve.

CHAPTER 5

Analysis and Results

The analysis of the 320 multiple regression models indicated widely varying results among the components (Racial diversity levels, Racial group, Quality of life scores and MSA population size) of the study. This section examines and summarizes the results of the models for Race, Diversity Index Measure, and the four Quality of Life aspects by MSA Population Group. Overall, the results do not illustrate a positive relationship between racial diversity and quality of life. Evaluated together, the 320 regression equations do not provide a decisive conclusion to the hypothesized relationship between racial diversity and quality of life. This section summarizes the results of the models for Race, Diversity Index Measure, and Quality of Life after separating the data by MSA population group.

The quadratic equations describing the relationship between the racial diversity and quality of life were not significant. Less than 10 percent of the 320 multiple regressions demonstrate a significant relationship between diversity measures and quality of life indicators (see Appendices A.1 – A.16). Many of these insignificant results can be attributed to the low population numbers of certain racial groups in various metropolitan areas. For instance, of the 80 models describing the parameters of the Native American population groups (Appendices A.1, A.5, A.9, and A.13), only one equation (Size group

4 – NAHDIS) is significant. This single equation accounts for about one percent of all 80 equations tested for Native Americans in this study. Upon examination of the P-plot for this equation (Figure 5.1), it is clear that among the Native American population, some cities have more leverage, or act as outliers, than the majority.

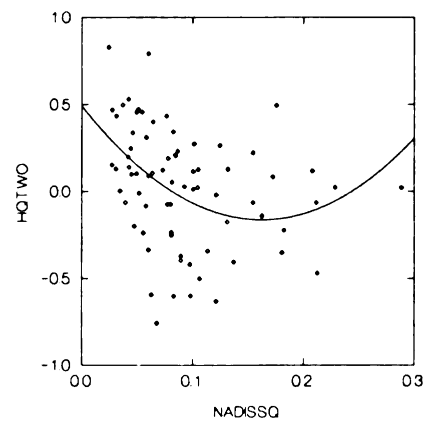


Figure 5.1 – Quadratic Plot for Native Americans Population Group Four (Housing Quality of Life vs. Dissimilarity Diversity Index).

In figure 5.1, one can see that the majority of the smaller MSAs are plotted in the middle-left portion of the axis. This is a clear indication that, among this group the housing quality of life improves as the diversity increases. In this example, Laredo, TX and Danville, VA have the most influence on the equation. Laredo has a very high proportion of Native Americans in its population while Danville has a very small percentage. High leverage values indicate that the data points associated with these towns have disproportionate weight on the equation.

The entire data set, for all racial groups, was thoroughly examined for outliers and high leverage values. While the majority of the residuals from the significant equations from all racial groups were homoscedastic, some outliers and leverage values were identified. For this analysis, leverage values of 0.4 were considered to be inappropriate. None of the significant equations in this study have leverage values higher than 0.4; as a result; none of the models were dropped due to high leverage.

Racial Groups

Despite the low overall significance of the multiple regression models the research hypothesis did hold true for many of the equations. In fact, the hypothesis is strongest (72 percent of all significant equations have a U - shaped curve) at the smallest group size level. As the urban area's size diminishes the percentage of U- shaped curves increases as well (Table 5.1).

Table 5.1 – Percentage of Parabolas for all Significant Equations that Adhered to the Research Hypothesis (by Group Size).

	Total # Equations	***# of (∪)***	***# of (∩)***	**%**
Group 1	6	2	4	33
Group 2	4	2	2	50
Group 3	5	3	2	60
Group 4	7	5	2	72

Only 1 of all 80 equations (less than 2%) for Native Americans fit the criteria for acceptance of the hypothesis that racial diversity affects quality of life. Significant relationships between diversity and quality of life appear more often in the other racial groups. The Hispanic, African American, and Asian groups all had close to a 10% significance rate. Since the Native American population group did not match the other percentages, determining overall trends among all groups became problematic. For this reason, the Native American results were not included in the majority of the trend analyses.

Significant equations appear more frequently in the three remaining racial minority groups than in the Native American population (African Americans 8%, Hispanics 9%, and Asians 10%). While these rates are similar, the type of index, group size, and quality of life measure they represent are drastically different. In addition to these differences, the size and shape of the parabolas of the significant equations also indicates a large amount of variance between racial diversity and quality of life.

The African American group (Appendices A.3, A.7, A.11, and A.15) has an 8% significance rate, and many of these equations adhered to the second part of the research hypothesis. Specifically, only four of six (66%) of these equations had a "U-shaped" (∪) parabola (Figures 5.2, 5.3). In these figures the differences in parabola shape is quite extreme. Figure 5.2 is very well defined and indicates an increase in social quality of life as the diversity improves. The parabola depicted in Figure 5.3 is also quite defined, and supports the hypothesized relationship as well.

When examining the b and c parameters for the two equations (Table 5.2), we see that the c parameter for (B2) shows a slightly larger increase in quality of life (social and total quality of life respectively, in these cases). These two equations are particularly

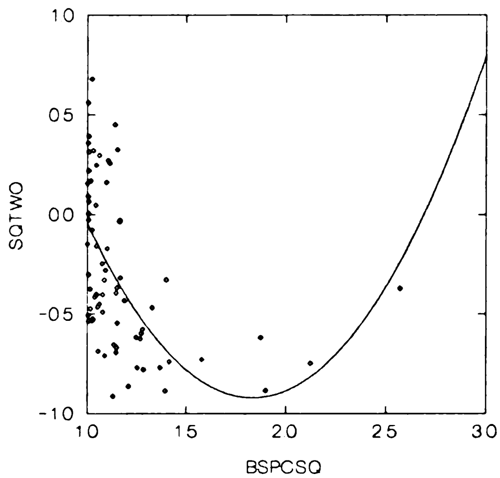


Figure 5.2 – Quadratic Plot for African Americans Population Group Four (Social Quality of Life vs. Spatial Clustering Diversity Index).

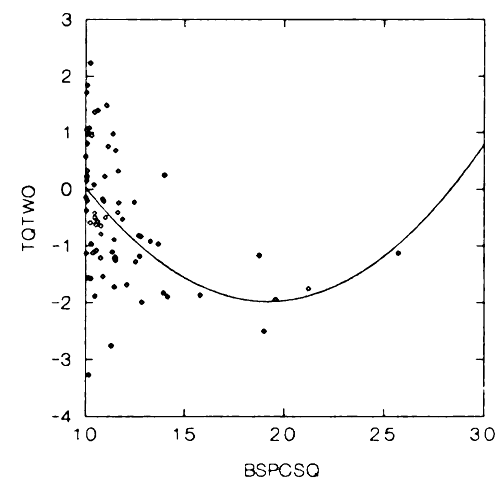


Figure 5.3 – Quadratic Plot for African Americans Population Group Four (Total Quality of Life vs. Spatial Clustering Diversity Index).

interesting because they both agree with the research hypotheses, and also show a similar relationship for social and the aggregate quality of life. While these equations come from the same size population group (4), we see that both are partially explained by the Spatial Proximity index.

Table 5.2 – Constant and Parameter Values for Two Significant Multiple Regression Equations.

Equation	***(a) Constant***	***(b) Parameter***	***(c) Parameter***	***Shape***
AA4SSPC (B1)	167.834	-268.862	+100.775	(∪)
AA4TSPC (B2)	227.767	-358.908	+131.415	(∪)

This result provides some evidence that an increase in African American diversity helps improve the social quality in some areas, and also indicates that in some cases the improvements take place at more than one MSA population group size.

The other significant equations did not support this type of conclusion however, especially among African Americans in larger MSAs. In fact, half of the significant equations portray a downward or (∩) shaped parabola. For instance, in examining the two equations (Figures 5.4, 5.5), the curves of the parabolas are clearly "bell" shaped.

The above two equations are revealing because they show that centralization is particularly important within the African American populations, especially at the medium MSA size level (2 & 3). Even though the overall hypotheses are not supported by these models, a closer analysis of the two figures clearly indicates that the housing quality of life conditions generally diminish as centralization diversity decreases or as segregation levels increase. This trend helps to further substantiate claims of previous segregation

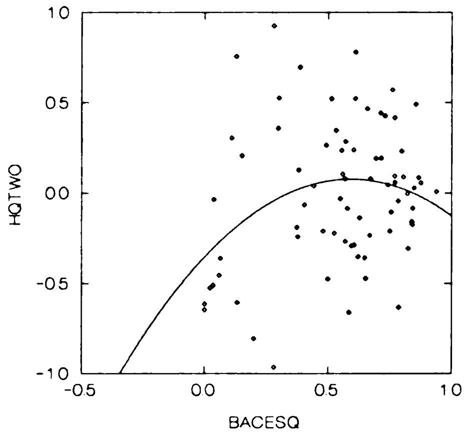


Figure 5.4 – Quadratic Plot for African Americans Population Group Two (Housing Quality of Life vs. Absolute Centralization Diversity Index.)

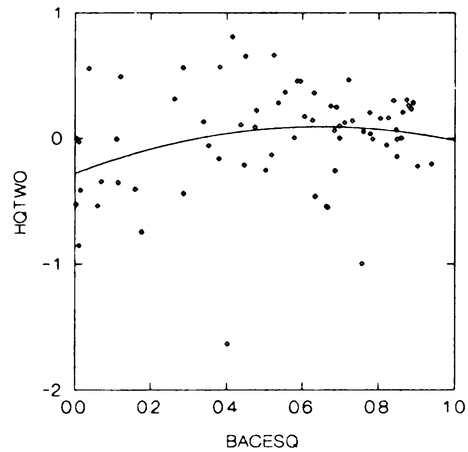


Figure 5.5 – Quadratic Plot for African Americans Population Group Three (Housing Quality of Life vs. Absolute Centralization Diversity Index).

studies (Massey and Denton 1988, Ginsburg 1990, Bickford and Massey 1991, Murdie 1994, Fong 1994).

Similar results can be seen within the Hispanic and Asian populations as well. As previously mentioned, these two groups had slightly higher significance rates (Hispanics 9%, Asians 10%) and also reveal other aspects of the relationship between diversity and quality of life. Within the Asian population group's significant equations (Appendices A.2, A.6, A.10, and A.14), half (4 of 8) support the research hypothesis. All four of these equations are partially explained by the dissimilarity or spatial proximity measures; in addition, we see improvements in quality of life with increased diversity at all four population size groups. Two of these equations (SPC) indicate social improvements, while the (DIS) equations account for improvements in economic and housing quality of life. Like some of the equations for the African American population group, the equations that adhere to the hypothesis indicate that many quality of life aspects improve with an increase in diversity levels (Figures 5.6, 5.7). In these graphs, one can see that as the level of dissimilarity increases (more diverse MSAs), both the housing and economic quality of life show enhancements. In these cases the quality of life types occur frequently where diversity levels are higher and generally decrease as more dissimilarity is seen among MSAs.

The significant equations that are bell-shaped ($\cap$) indicate that quality of life conditions are enhanced with a more diverse population. The four equations that did not meet the hypothesis are partially explained by the isolation measure, This which assisted in helping to explain the social and overall quality of life in 3 of the 4 population size groups.

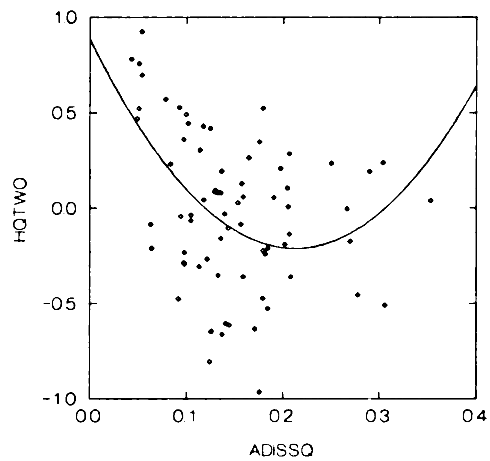


Figure 5.6 – Quadratic Plot for Asians Population Group Two (Housing Quality of Life vs. Dissimilarity Diversity Index).

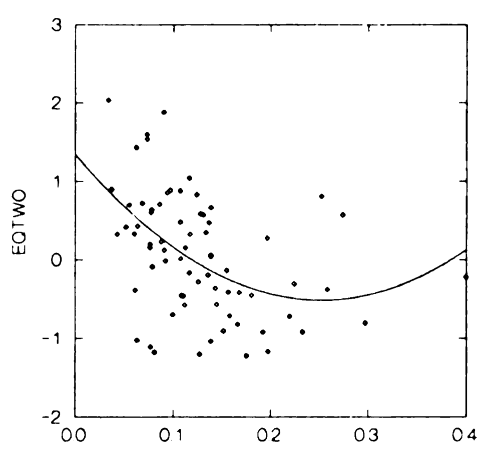


Figure 5.7 – Quadratic Plot for Asians Population Group Three (Economic Quality of Life vs. Dissimilarity Diversity Index).

Several interesting aspects of the relationship between diversity and quality of life were seen in the Hispanic population group (Appendices A.4, A.8, A.12, and A.16) as well. The analysis shows that of the 7 significant equations, only 2 (28%) of the resulting parabolas had U-shaped (∪) curves,

supporting the proposed hypothesis. The equations for the Hispanic population explain that in most cases the resulting parabolas are bell-shaped (∩). Here all three types of quality of life slightly diminish with an increase in Hispanic diversity. The largest decreases can be seen in conjuncture with the social quality of life aspects (Figures 5.8, 5.9) In these graphs the increases in the b parameter and decreases in the c parameter occur as the MSAs become more diverse.

Each graph has a few outliers that had some leverage on the equations. For example in Figure 5.8, the points for the cities of Los Angeles, New York, and Miami can all be seen on the right end of the diagram just above the "quadratic fit" curve. High leverage values indicate that the associated data points have disproportionate weight on the equation. In other cases, the MSAs with very large Hispanic populations such as Chicago, Hartford, and Fresno (Figure 5.9), the leverage values have little influence on the diversity and quality of life variables. None of these cases have a leverage value over 3.5 and the results were still deemed reliable and their inclusion in the data set was appropriate.

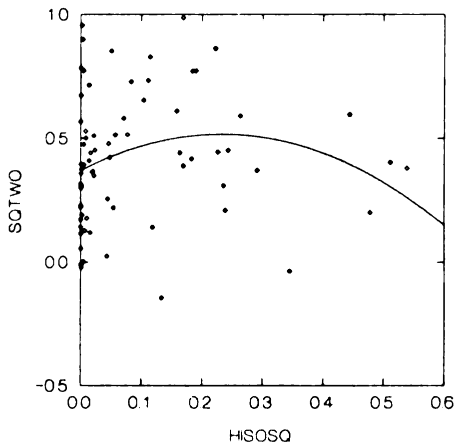


Figure 5.8 – Quadratic Plot for Hispanics Population Group One (Social Quality of Life vs. Isolation Diversity Index).

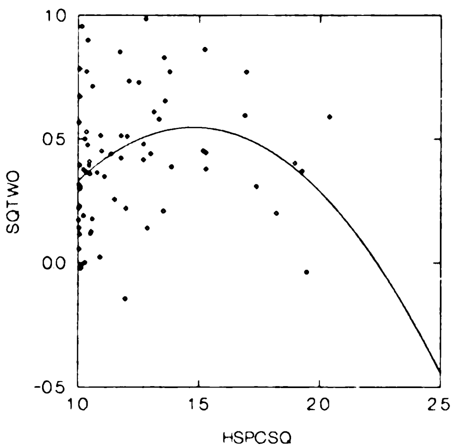


Figure 5.9 – Quadratic Plot for Hispanics Population Group One (Social Quality of Life vs. Spatial Clustering Diversity Index).

Quality of Life Types

All three aspects of quality of life, as well as the aggregate quality of life index, provide varying accounts of the positive and negative influences of racial diversity. Patterns within the quality of life categories can be detected across all significant equations (Figure 5.10).

In the significant equations for this study, the social and housing quality of life aspects are affected the most by racial diversity. The social quality of life accounts for 35% of the significant equations and occurs most frequently in the largest metropolitan areas. While the changes in social quality of life are not always increases, the results show that diversity levels have more of an effect on the variables within this category.

One interesting aspect of social quality of life can be seen in Figure 5.10. In both large and small metropolitan areas, social quality of life is influenced more by racial

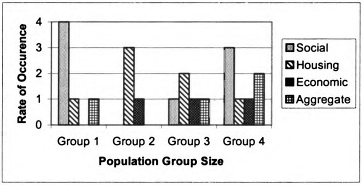


Figure 5.10 – Quality of Life Types and their frequencies among the Significant Equations for Population Size Groups.

diversity than is economic and housing quality of life. The large amount of federal and state financial assistance allocated for municipal buildings and cultural centers in large cities may help to explain part of this trend. By simultaneously examining size and levels of diversity, one can see other explanations for the relationship. Within a few large cities, the high levels of isolation or spatial clustering between ethnic groups inhibits the exposure or access of some minority groups to the social amenities available in these areas. This pattern, which essentially says that ethnic isolation inhibits social quality of life, is shared across all of the multiple regression equations, not just the significant ones. In some cases, however, even large increases in diversity do not improve the social quality of life. Additional, more detailed investigations are necessary to further quantify these possibilities.

Among the significant equations (32%), the housing quality of life is also heavily influenced by the diversity patterns. Although less than half of the equations have corresponding parabolas with U-shaped (∪) curves the housing quality of life indicator is the only quality of life aspect that was affected at all four population group sizes. In fact, for this study, the housing quality of life indicated a positive and/or negative change from the influence of diversity the most reliably.

When considering the housing quality of life, this study shows that a decrease in racial diversity is often concurrent with an improvement in housing quality. The results also indicate that higher African American and Hispanic diversity can negatively affect some aspects of housing quality of life (Table 5.3). This effect varies spatially as well as by city size. For instance, among the largest metropolitan areas, an increase in the relative concentration of Hispanics indicates a substantial decline in housing quality of life. When examining the second and third population group sizes, the declinations coincide with increases in African American levels of absolute centralization.

The opposite seems to be true of the Asian population. The only significant equation that suggests a change in housing quality in relation to Asian diversity (absolute centralization) occurs at the population group size 2. This model resulted in a "U" shaped (∪) parabola, that clearly indicates an increase in housing quality (Table 5.3).

The economic quality of life scores are the least influenced by the diversity measures. Only 3 of 22 (14%) of the significant equations revealed a change of

Table 5.3 - Constants and Parameters for all Significant Multiple Regression Equations Involving Housing Quality of Life. (Racial Group, MSA Group Size, and Diversity Index denote the Equations.)

Equation	*(a) Constant*	*(b) Parameter*	*(c) Parameter*	*Shape*
H1(RCO)	.343	-.366	-1.037	(∩)
H2(RCO)	.261	-.561	-.328	(∩)
A2(DIS)	2.727	-13.164	14.922	(∪)
AA2(ACE)	-.215	.995	-.819	(∩)
H3(ACE)	-.245	.883	-.508	(∩)
AA3(ACE)	-.175	1.091	-.927	(∩)
NA4(DIS)	1.481	-8.493	11.172	(∪)

economic quality of life, and two of the three equations revealed "U" shaped (∪) parabolas (Figure 5.10). Among the results of the largest urban populations, racial diversity levels do not affect economic quality of life very often. In addition, these results show that even as city size diminishes the relationship between diversity and economic quality of life does not change much; there is neither major improvement nor degradation of economic conditions as size decreases. These findings further support the claims of other quality of life studies (Johnston 1988; Dasgupta and Weale 1992; Burnell and

Galster 1992; Stover and Leven 1992) which report that quality of life is not determined solely by economic factors. In this case, the social and housing quality of life measures are affected by diversity, while the economic quality of life type fails to account for the relationship.

The aggregate quality of life measure only had four significant equations (19% of the total). Of these, only one (25%) supports the research hypothesis and indicates a U-shaped (∪) curve (Table 5. 4). The one positive relationship seen for this model type was the spatial clustering index for African Americans. Here the increase in the c parameter coincides with the improvement in the aggregate quality of life. These results are seen at the smallest metropolitan level where often the economic, housing, and social conditions are poor for all people - especially minorities. The two equations that show the most improvement in the aggregate quality of life measure are found in the Asian

Table 5.4 – Constants and Parameters for all Significant Multiple Regression Equations Involving the Aggregate Quality of Life Measure. (Racial Group, MSA Group Size, and Diversity Index denote Equations.)

Equation	***(a) Constant***	***(b) Parameter***	***(c) Parameter***	***Shape***
H1(ISO)	.545	3.059	-6.089	(∩)
A3(ISO)	-.505	17.152	-66.062	(∩)
A4(ISO)	-1.029	20.383	-60.384	(∩)
AA4(SPC)	24.475	-38.394	13.991	(∪)

population group sizes three and four. At these levels we can see a solid decline in overall quality of life as the diversity levels of isolation among Asians increases. Both of these examples show a similar, very large decrease in the c parameter despite their varied population sizes. This trend is intriguing because it suggests that isolated areas such as stereotypical "China Towns" can be detrimental to an urban area's quality of life. In fact, it appears that the less isolated the Asian community is among medium sized cities, the better the overall quality of life is likely to be.

The evidence from this study shows that the criteria chosen to represent the quality of life of a city's inhabitants are very important. As seen here, the various types of quality of life are affected by cultural diversity in various manners. Another important determinant to this relationship is the population size of the metropolitan area. These examples all indicate that results differ among the four population sizes selected for this study. Both of these measures shed a different type of insight into the relationship between racial diversity and quality of life; it is crucial that more attention be given to them in future studies.

Index Type

All five racial diversity indexes help to understand the relationship between diversity and quality of life. The five indexes varied according to the minority groups as well as by the size of the metropolitan statistical area. No single index captures all the aspects of the relationship between diversity and quality of life. However, some indices provide more insight into this relationship than others do. For example the isolation index (ISO) was found to affect 32% of all the significant equations while the relative concentration index (RCO) affected less than 9%. This discrepancy attests that the isolation index was more beneficial to this study in helping to understand the relationship between racial diversity and quality of life.

Of the five diversity indices, the isolation index (ISO) and the spatial clustering index (SPC) performed in the most dependable manner. These indexes accounted for 7 of 22 (over 60%) of the 22 significant equations (Figure 5.11). The dissimilarity index (DIS) and absolute centralization index did not perform as well as the previous two indices, but did an adequate job helping with the examination of the relationship. These indexes accounted for 3 of 22 (14%) of the significant equations. The one index that did not provide much insight into the relationship between racial diversity and quality of life was the relative concentration index (RCO). This index only accounted for 2 of the 22 significant equations (less than 10%).

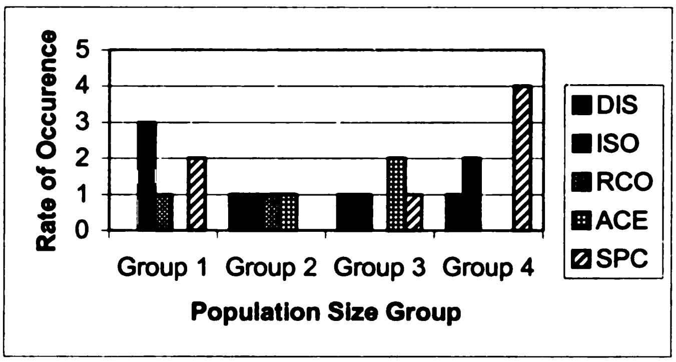


Figure 5.11 – Racial Diversity Indices and their Frequencies among the Significant Equations for Population Size Groups.

The frequencies in which the indices appear in the significant equations are not the only criteria for these assessments. The other aspects that were examined are the resulting parameters and parabolas from the significant equations each diversity index was part of. For instance, of the three significant equations in which the dissimilarity index played a role, all three resulted in U-shaped (∪) parabolas. This indicates that the index does a reasonable job examining positive changes in quality of life. The resulting curves show that it is a good tool for measuring a positive influence of diversity on quality of life.

The two indexes that most helped explain change in the significant equations the have drastically different parabola shape results. In fact, even though the isolation index and the spatial clustering index help to explain seven significant equations, the shape of the fourteen parabola curves are opposite. The parabola shape results for the isolation index equations all depict bell-shaped (∩) curves (Table 5.5).

Table 5.5 - Constants and Parameters for all Significant Multiple Regression Equations Involving the Isolation Index. (Racial Group, MSA Group Size, Quality of Life Type, and Diversity Index denote Equations.)

Equation	*(a) Constant*	*(b) Parameter*	*(c) Parameter*	*Shape*
H1SISO	.306	1.112	-1.520	(∩)
H1TISO	.545	3.059	-6.089	(∩)
A1SISO	.247	1.994	-2.335	(∩)
H2EISO	-.265	4.440	-8.468	(∩)
A3TISO	-.505	17.157	-66.062	(∩)
A4SISO	-.511	8.727	-27.026	(∩)
A4TISO	-1.029	20.383	-60.384	(∩)

From this table it is easy to pinpoint the usefulness of the isolation index. Even though all seven equations have drastically different parameter changes, the shapes of the parabolas all indicate that an increase in isolation diversity can have an adverse affect on the quality of life in certain areas. These results show that the isolation index is the most useful for examining other aspects of diversity.

As mentioned, the spatial proximity index did the best job describing the relationship hypothesized by this study. In fact, when the significant equations for the spatial clustering index are examined, we see that the resulting parabola curves are all U-shaped (Table 5.6) - opposite of those of the isolation index. Despite a wide variety of parameter changes, all the equation results indicate an improvement in quality of life with varying diversity levels. However, unlike the isolation index that represent equations from all four population size groups, the

Table 5.6 - Constants and Parameters for all Significant Multiple Regression Equations Involving the Spatial Clustering Index. (Racial Group, MSA Group Size, Quality of Life Type, and Diversity Index denote Equations.)

Equation	***(a) Constant***	***(b) Parameter***	***(c) Parameter***	**Shape**
H1SSPC	-7.120	12.751	-5.305	(∪)
A1SSPC	-44.679	82.231	-37.282	(∪)
AA3SSPC	11.414	-18.658	7.359	(∪)
A4SSPC	-420.689	808.401	-388.224	(∪)
AA4ESPC	16.290	-25.825	9.636	(∪)
AA4SSPC	12.910	-20.682	7.752	(∪)
AA4TSPC	24.475	-38.394	13.991	(∪)

spatial clustering index influences the fourth population group size the most. Upon further examination, the spatial proximity index scores are in fact very high (limited diversity) among the smaller metropolitan areas. This indicates that the spatial clustering index is particularly useful at the smaller city level, but can also be relied upon as a diversity measure for all four population size groups.

The remaining three diversity indexes do not help as much with the relationship between diversity and quality of life as the first two. Both the dissimilarity index and the absolute centralization indices only account for six of the twenty-two (13% each) significant equations. The significant equations that the dissimilarity index helped explain suggest that certain aspects of quality of life improve as diversity levels increase. In fact, the resulting parabolas for all three equations have U-shaped (∪) curves (Table 5.7). The opposite is true for the absolute centralization index. All three of these

Table 5.7 - Constants and Parameters for all Significant Multiple Regression Equations Involving the Dissimilarity and Absolute Centralization Indexes. (Racial Group, MSA Group Size, Quality of Life Type, and Diversity Index denote Equations.)

Equations	*(a) Constant*	*(b) Parameter*	*(c) Parameter*	*Shape*
A2HDIS	2.727	-13.164	14.922	(∪)
A3EDIS	3.423	-15.354	15.393	(∪)
NA4HDIS	1.481	-8.493	11.172	(∪)
AA2HACE	-.215	.995	-.819	(∩)
H3HACE	-.245	.883	-.508	(∩)
AA3HACE	-.175	1.091	-.927	(∩)

parabolas indicate a slight decrease in housing quality of life when diversity levels improve (Table 5.7).

The results of the equations show that both indexes can be useful for examining various population group levels. For instance, significant equations are seen for the dissimilarity index at the second, third and fourth population groups. The absolute centralization index equations have similar results that indicate the index is useful at the second and third population group level.

As stated earlier, the relative concentration index is the least helpful in the examination of the relationship between racial diversity and quality of life. This index account for less than ten percent of the significant equations (two equations), and both of these indicate limited increases in quality of life. Although the results of this study indicate that the relative concentration index is not influential in the examination of this relationship, further research incorporating all five indices should continue to be undertaken.

CHAPTER 6

Conclusions and Future Considerations

Although the results from the analysis did not indicate a strong a relationship between racial diversity and quality of life, some aspects of the results were quite promising. There were also a few negative outcomes from the analysis that helped to confirm the results of previous studies involving segregation as well as housing quality. Having identified a gap in the racial diversity and quality of life literature, this study should provide a substantial platform for similar, more detailed investigations.

The interpretation of the statistical data would be more readily discernable if the results had shown a stronger relationship between racial diversity and quality of life. One area where a strong relationship was seen was among the smaller metropolitan areas. In these cases, over 70% of the significant equations adhered to the research hypothesis. Overall, the smaller metropolitan areas had more diversity with relatively larger ratios of African American, Hispanic and Asian communities than the larger cities. In most cases, as the metropolitan area increased in population size the relationship between racial diversity and quality of life became weaker. Part of this can be attributed to the lower overall populations of minorities among urban areas of this size. As explained earlier, minority ratios vary amid cities of different size as well as regions. In these situations, smaller minority populations can assimilate with the majority population easier, thereby lowering the diversity index scores. The resulting higher levels of diversity help to improve the social quality of life conditions in such cities as Sioux Falls, South Dakota or Burlington, Vermont. In addition, smaller cities with universities such as Charlottesville, Virginia or Bloomington-Normal, Illinois have even better diversity and quality of life scores.

Another reason the relationship is stronger at this level might be due to the fact that many of these smaller metropolitan areas do not have established or defined central business districts. This factor plays a large role in determining the diversity scores for the centralization and concentration measures. In many cases among minority groups, the diversity scores for the smaller cities are much better (lower scores) than those of the large metropolitan areas. In cities such as New York, and Chicago, which have very established central business districts, the results indicate that the scores for the centralization and concentration indices are much higher (less diversity).

The measure of spatial proximity also plays a major role at this level. As seen in Figure 5.11, this index provided the most insight into metropolitan areas with smaller populations. The results indicated that many smaller urban areas have a more racially diverse community and that these improvements in diversity have a positive impact on the social quality of life. In contrast, many large cities had very high scores for their spatial proximity measure, which indicate that the massive populations of the larger urban areas influence the ratios between the majority and minority groups.

Denton (1994) addresses this dimension and refers to it as the "checkerboard problem" in her article "Are African Americans Still Hypersegregated?". In this study she examined 44 MSAs (almost all would fit into the group 1 population size category in this study) and reported that many of these cities experience high levels of segregation along all five diversity indices. In addition the diversity conditions of many of these areas worsened from 1980 – 1990.

Although some of the results from my study support her conclusions, I feel that her outlook is rather bleak. In addition to working from a small sample size (n=44), she chose to use variables that only reflect the economic well being of the minority groups. Without question this is an important criteria. Previous literature (Sufian 1993; Burnell and Galster 1992; Dasgupta and Weale 1992; Stover and Leven 1992; Glatzer and Mohr 1991; Smith 1982) shows that the economic well being of a population is not always a direct reflection of the quality of life of that same group. Denton's study identifies the nature of segregation and income distribution disparity in Metropolitan Areas, but it does not make an attempt to find a solution as to how we can improve the living conditions of minority populations.

By including separate housing and social quality of life components, my study was able to uncover several positives that could have been overlooked, as they were in Denton's study. These results indicate that in some cases the economic, housing, and/or social quality of life improves with an increase in racial diversity. Although most of these improvements were seen at the smaller and medium MSA levels, several were also seen among the largest population size group.

For example, among the largest metropolitan areas, the significant equations for Asians and Hispanics indicated that the social quality of life improves as the clustering of this minority group diminishes. While the overall results were not as significant as anticipated, equations such as these provide valuable insight into a very complex relationship. By "unearthing" some positives amidst the normal negatives associated with previous studies, perhaps some insight has been shed into addressing some of society's inherent difficulties.

Another area in which a strong relationship could be seen was among the dissimilarity and spatial proximity indexes. As mentioned in Chapter 5, these two dimensions of racial diversity accounted for almost half (10 of 22) of the significant equations in this study. In addition to this high percentage, the resulting parabolas were all U-shaped ($\cup$). These results suggest that the quality of life in the various cities improved as their populations became more diverse. Among these ten equations, we see that all of the minority groups have an impact on at least one of the population size groups. For example, at the largest metropolitan area level, there was an equation for both the Hispanic and Asian populations. The equation for the Hispanic minority group indicates that the social quality of life for large cities improved significantly, as the dimension of spatial clustering became more diverse. Likewise, as the spatial proximity index values showed improvement in diversity for the Asian inhabitants, the quality of life scores increased. Although the results indicated only a slight enhancement in the social quality of life in these cases, the impressive aspect of these results stems from the fact that diversity levels of two different minority groups had an impact on metropolitan areas of such large size.

These results shed some insight into a previous study. In Burnell and Galster's article (1992) "Quality-of-life Measurements and Urban Size: An Empirical Note," the authors set up their study to determine if an optimal population size exists where quality of life is highest. The authors point out that large cities have a tremendous "down side" to them.

> Certain amenities decline as population increases. There are lower levels of environmental quality, higher crime rates, and increased congestion of some publicly provided goods such as highways. Amenities such as beaches and scenic areas become congested as population size grows (Burnell and Galster 1992, p.727).

According to these types of assessments, it would be unlikely to find any type of positive relationship between diversity and social quality of life. However, the Hispanic and Asian equations clearly indicate that significant positive relationships can occur among the largest urban areas. In these cases the spatial proximity index scores for the largest metropolitan areas revealed that as the minority groups were more dispersed among the entire population, the social quality of life improved.

As mentioned in Chapter five, all seven of the significant equations that the isolation measure helped to explain resulted in bell shaped (∩) parabolas. Four of these helped represent the largest metropolitan statistical area group. Although these results imply that there is no positive relationship between diversity and quality of life at this population level, all four strongly indicated that all quality of life categories decrease with less diversity. In these cases the isolation index scores revealed numerous pockets of extremely isolated populations of all minority backgrounds.

The resulting parabolas for both the isolation and spatial clustering indexes, although opposite in shape, unveil some intriguing insight into some of the residential problems that plague our cities today. These two indices seem to assemble two important pieces to the complex puzzle between diversity and quality of life. In particular, the equations for the isolation index show that the worst quality of life conditions exist in big cities with high incidents of isolation among the minority groups. Amid these same urban areas, the only index that identifies some improvements or provides a positive "slant" on the relationship is the spatial proximity index. This finding is logical because it reveals that the worst diversity conditions exist within areas of high minority isolation. It becomes intuitively obvious that an increase in the spatial proximity of this same minority group to the majority population should result in an improvement of various quality of life measures. In these situations, the social quality of life improved in several of the spatial proximity equations. In this regard, the spatial proximity index is an important tool in examining the relationship between racial diversity and quality of life. Finding new methods to utilize the spatial proximity measure, or refining the index, might result in more detailed findings in future studies.

The results of the spatial proximity equations were also beneficial because they help to substantiate the claims of previous authors on the subject of racial diversity and assimilation (Massey and Mullan 1984; Massey 1985; Portes and Mullan 1985). In Massey and Mullan's article, the authors suggest that as minority groups assimilate into the host society, the physical proximity between the minority group and the members of the majority becomes closer, indicating that minority groups and majority members will be more likely to share neighborhoods. In fact, research has shown that recently arrived immigrants often remain in their ethnic enclaves (Massey 1985; Portes and Mullan 1985). They are often reluctant to assimilate into the host society because of poor language ability. This often results in a lower residential proximity with the majority group (Fong 1994).

The 1990 US Census Bureau data used for this study support these claims, especially among the largest metropolitan statistical areas. Among these cities most of the spatial proximity index scores were high, indicating that the assimilation or checkerboard effect was minimal. The African American group had the highest spatial proximity index scores overall and the results indicated no significant equations for this group. However, as mentioned, the social quality of life for the Asian and Hispanic populations improved as diversity levels increased. Not surprisingly, the spatial proximity index scores for these two groups were lower than the African American group, indicating a more diverse distribution and assimilation with the majority population.

The big picture depicted by the spatial proximity index and the African American population is by no means bleak. There is no question that serious, more effective economic and housing strategies are sorely needed for the African American communities in large urban areas. However, on a more positive note, the spatial proximity scores for the African American groups show overall improvement, as the city's population size becomes smaller.

Some of the brightest examples of this phenomenon are the seven significant equations that indicated an improvement in quality of life as racial diversity increased. Four of these seven equations clearly show that as the spatial proximity of African Americans became more dispersed (improved), most quality of life types improved. All four of these equations occurred at the two smaller population size groups (3 and 4). In separate equations- the economic, social, and aggregate total quality of life showed improvements, as the cities became more diverse.

As well as some of the racial diversity indexes performed, it is imperative that new and improved indices are continually brought forth in the literature. Massey and Denton (1988) have made great strides by identifying the five most effective indexes from the plethora that exist (twenty). However, my study in particular would have benefited from the use of a model that could incorporate all the minority ratios in the same equation. The five diversity indexes used here all measure a specific minority group by their population's relation to a city's white majority. While these measures provide valuable information on the diversity of a specific minority group within an urban area's population, they are unable to provide information on the diversity between minority groups. This would be extremely helpful in examining the complex relationships found in studies of this type. For instance, the isolation index score for a minority group within a given city depicts how isolated the group is from the majority population. What these indices do not reflect is whether or not the four minority groups are isolated from one another. Urban geographers and sociologists should continue to advance and improve these types of indices. As the index measures become more comprehensive, the research can continue to move from a theoretical framework to an "applied science."

Another very interesting aspect of my study was the quality of life criteria. As mentioned in Chapter 3, constructing a quality of life measure by combining various elements is a difficult and complex challenge. Previous studies (Giannias 1997; Evans 1994; Sufian 1993; Burnell and Galester 1992; Dasgupta and Weale 1992; Lawrence 1992; Glatzer and Mohr 1991; Blomquist et al. 1988; Johnston 1988; Berger et al. 1987; Myers 1987; Dahmann 1985) offer numerous approaches and methods for creating an accurate and comprehensive quality of life index. In setting out to construct quality of life indexes for the economic, housing, and social attributes of the metropolitan areas, my study incorporated a variety of these components.

As past studies have shown, there is no definitive way to establish a perfect quality of life index. The researcher has to utilize the best data available and make an effort to avoid including variables that might have too much collinearity (Glatzer 1991). As in most quality of life studies, some variables are more influential in helping to explain each component. In his article, "Toward a Comprehensive Quality-of-Life Index," Johnston (1988) tried to emphasize this point by noting that an index does not provide a single measure of the overall quality of life of the population of the United States. However, it does offer a reasonably comprehensive assessment about the general conditions in the society and whether those circumstances are improving, remaining static, or deteriorating.

Future considerations towards this type of research should continue to improve upon the variable selection and criteria for the quality of life components. Various economic, housing, and social data are becoming more readily available every day. In addition, more detailed data at a smaller (neighborhood) scale are beginning to be collected on a regular basis by the US Census Bureau. This study would have benefited greatly from this type of data. Although the metropolitan statistical area level has the most data available, the large areas and populations tend to blur the details between the diversity and quality of life indices. Recent research (Mehretu and Sommers 1994, Mehretu et al. 1995) suggests that using a microgeographic scale (county, ward, or tract) for analysis can help provide more accurate and detailed results than a city level can. The type of research in my study would be ideal at a neighborhood or census tract level.

Unfortunately, these types of data were not available at the time my project was undertaken. It should be a priority to urban geographers, sociologists, and urban planners to collect and compile more information databases at this smaller, more precise level.

This microgeographic scale becomes very evident when comparing the results of the different population size groups. As the MSA populations became smaller, it was easier to determine some of the influences the ethnic diversity levels had on quality of life types. This 'diseconomies of scale' example would be even more prevalent had my study been able to examine the relationship between diversity and quality of life at the census tract level. For instance, if we were to examine a census tract with 1,500 people, we would have a much clearer picture of not only the diversity index values but also how much the quality of life was being affected. This is not to say that subjects as complex as diversity and quality of life or their relationship, would be any easier to interpret. Rather, that utilizing a microgeographic scale would be a good starting point when examining this type of subject material.

Most urban geographers and sociologists agree that these combined measurements need to be continually improved. Even though the process for choosing the quality of life variables was highly selective and thorough, some of the variables reflected the various quality of life types better than others. An example of this can be seen within the social quality of life component. The aggregate scores from this component are basically comprised of two different types of variables. As mentioned in Chapter 3, the first five variables are descriptors of quality of life aspects for individuals within various urban areas. The other eight variables all characterize the social living conditions of the metropolitan areas themselves.

In hindsight, a more effective component structure for social quality of life might have been to utilize these two types of variables separately. This method might have been able to shed insight into two different aspects of social quality of life. However, the two variable types selected were truncated because a lack of social quality of life data exists for the 288 metropolitan statistical areas this study examined. In addition, these 13 variables used together formed a comprehensive and inclusive social quality of life measure. An ideal situation for future studies in this area would be to have more data on the populations within the 288 cities (perhaps 15 social quality of life variables). The study could then compare these results with the results of the social quality of life variables (an additional 15) that describe the conditions of the cities themselves. This would ensure a very thorough and encompassing examination, as well as insight into two dimensions of social quality of life.

Another interesting aspect of this study was the lack of significant results for the total or aggregate quality of life component. Only four of the twenty-two (18%) significant equations showed an improvement, or decrease, in the combined quality of life as diversity increased. This helps confirm previous studies that suggest breaking up an overall quality of life measure. Stover and Leven (1992) recommended using more than one type of measure for quality of life; "There may also exist more than one relevant variable set. Separate ratings based on separate indicators of physical environment, cultural environment, recreational environment, and so on, may prove useful" (p.746).

Lawrence, another advocate of using separate quality of life components, emphasizes the importance of housing quality. In his article, "Housing Quality: An Agenda for Research," he advises, "a range of values, costs and benefits ought to be borne in mind if interpretations of the qualitative aspects of housing are to be undertaken in a comprehensive manner (p. 1663)." Lawrence iterates that housing quality of life is an essential barometer of the health of an urban populace. As stated in Chapter 3, although such variables as *Median Gross Rent* could be utilized in an economic quality of life index, it was to my advantage to have a separate housing component.

These types of suggestions were indeed valuable as they helped to provide for 18 additional significant equations in this study. In addition, it enabled me to identify how various qualities within an urban area compare. For instance, each resulting significant equation in this study revealed important insight into one of four categories. From a solution standpoint, this meant 18 additional relationships could be examined. Had the study only relied on one aggregate quality of life measure, only four relationships could have been investigated.

As mentioned earlier, the ideas, concepts, and indices utilized in this research project are continually being updated and improved. Journals such as Urban Studies and Social Indicators Research continually offer the latest concepts and methodology available on these subjects. Studies of this type (Denton 1994; Fong 1994; Chakravorty 1992; Harrison and Weinberg 1990; Denton and Massey 1988b; Darden 1987; Allison 1978) seem to be moving away from the measuring of segregation and towards investigating the relationships between and among various racial and cultural populations (Houghton and Swati 1995; Jordan 1995; Gildwald and Habich 1991; Harvey et al. 1990; Dahmann 1985; Douthitt et al. 1992). This switch, combined with a shift from a theoretical to an applied basis, could help provide a number of solutions to some of societies most complex relationships.

Contemporary studies should embrace this movement and focus on how to improve the diversity and quality of life issues within our metropolitan areas. Urban geographers and sociologists have brought the unequal economic, housing and social conditions within US cities to society's attention. There is no inherent gain in continuing to point out our deficiencies and weaknesses. Studies such as Denton's (1994) "Are African Americans Still Hypersegregated?" help to see if conditions are worsening or improving, but provide little insight on how to devise a solution for these ongoing problems.

In contrast, more modern studies like Dahmann's (1985) "Assessments of Neighborhood Quality in Metropolitan America" not only examine the relationships of various racial groups within metropolitan areas, but offer some possible solutions to help improve conditions within these areas. Authors of some studies (Sullivan et al. 1997), "Where Does Community Grow? The Social Context Created by Nature in Urban Public Housing" take this notion one step further as they actually apply their hypothesis in hopes of improving the social welfare conditions among public housing. These types of studies should become the benchmark pieces of the racial diversity and quality of life genres. The more information we can learn about the elaborate relationship between diversity and quality of life, the sooner we can begin to implement strategic solutions to improve conditions in both areas.

APPENDICES

APPENDIX A

APPENDIX A

Appendix Table A.1.	*Equations for Population Group 1. (Native Americans)*			
	Constant	X	X^2	Hyp. (H_1)
Group 1. (Native Americans)				
Economic QOL				
Dissimilarity	-.810	+5.795	-6.841	Reject
Isolation	1.954	-.546	-5.381	Reject
Relative Concentration	.329	+.156	.006	Reject
Absolute Centralization	.702	-1.602	+1.431	Reject
Spatial Clustering	.942	-.730	.112	Reject
Housing QOL				
Dissimilarity	1.797	-7.649	6.292	Reject
Isolation	.005	-3.222	8.213	Reject
Relative Concentration	-.080	-.169	-.006	Reject
Absolute Centralization	-.351	.910	-.633	Reject
Spatial Clustering	-2.164	2.452	-3.375	Reject
Social QOL				
Dissimilarity	-2.925	+37.941	-34.160	Reject
Isolation	5.189	+31.374	-70.686	Reject
Relative Concentration	5.887	-.0487	-.024	Reject
Absolute Centralization	6.747	-11.146	+14.553	Reject
Spatial Clustering	-7.829	+16.368	-2.744	Reject
Total QOL (aggregate)				
Dissimilarity	.666	1.183	-2.810	Reject
Isolation	.705	-.085	.375	Reject
Relative Concentration	.695	-.079	-.003	Reject
Absolute Centralization	.873	-1.703	2.130	Reject
Spatial Clustering	-1.737	2.869	-.453	Reject

Appendix Table A.2.	***Quadratic Equations for Population Group 1. (Asians)***			
	Constant	X	X^2	Hyp. (H_1)
Group 1. (Asians)				
Economic QOL				
Dissimilarity	-17.359	+116.989	-168.769	Reject
Isolation	1.265	+6.489	-1.447	Reject
Relative Concentration	1.407	+2.794	-3.105	Reject
Absolute Centralization	4.437	-5.923	2.913	Reject
Spatial Clustering	-398.161	+740.206	-341.118	Reject
Housing QOL				
Dissimilarity	2.509	-11.238	11.441	Reject
Isolation	1.043	-20.272	+28.535	Reject
Relative Concentration	2.651	-16.494	+18.161	Reject
Absolute Centralization	-2.730	-.933	+5.979	Reject
Spatial Clustering	410.949	-756.899	+346.786	Reject
Social QOL				
Dissimilarity	14.518	-49.912	+69.224	Reject
Isolation	**.274**	**+1.994**	**-2.335**	**Accept**
Relative Concentration	5.735	-1.723	+3.237	Reject
Absolute Centralization	6.816	-8.013	+8.805	Reject
Spatial Clustering	**-44.679**	**82.231**	**-37.282**	**Accept**
Total QOL (aggregate)				
Dissimilarity	1.120	2.114	-8.116	Reject
Isolation	.543	1.597	-.101	Reject
Relative Concentration	.938	-1.489	1.731	Reject
Absolute Centralization	.923	-1.663	1.779	Reject
Spatial Clustering	-59.462	109.102	-49.150	Reject

Appendix Table A.3.	***Quad. Equations for Population Group 1. (African Americans)***			
	Constant	X	X^2	Hyp. (H_1)
Group 1. (African - Americans)				
Economic QOL				
Dissimilarity	-.049	+12.225	-13.728	Reject
Isolation	2.363	+5.095	-10.254	Reject
Relative Concentration	2.210	+2.898	-4.291	Reject
Absolute Centralization	5.076	-6.997	+3.400	Reject
Spatial Clustering	12.760	-14.166	+4.381	Reject
Housing QOL				
Dissimilarity	-1.191	5.609	-5.756	Reject
Isolation	-1.211	+13.543	-20.037	Reject
Relative Concentration	3.270	-1.074	-5.447	Reject
Absolute Centralization	-2.869	+8.983	-6.755	Reject
Spatial Clustering	-3.126	5.462	-2.325	Reject
Social QOL				
Dissimilarity	7.489	-3.041	+.881	Reject
Isolation	8.852	-10.236	+7.614	Reject
Relative Concentration	6.417	-0.641	-0.205	Reject
Absolute Centralization	6.802	-2.973	+2.138	Reject
Spatial Clustering	35.653	-43.806	+15.717	Reject
Total QOL (aggregate)				
Dissimilarity	.082	5.052	-6.082	Reject
Isolation	.892	1.622	-3.390	Reject
Relative Concentration	1.190	.318	-1.335	Reject
Absolute Centralization	1.013	-.380	-.031	Reject
Spatial Clustering	2.498	-1.492	.093	Reject

Appendix Table A.4.	***Quadratic Equations for Population Group 1. (Hispanics)***			
	Constant	X	X^2	Hyp. (H_1)
Group 1. (Hispanics)				
Economic QOL				
Dissimilarity	1.364	+1.364	-1.036	Reject
Isolation	.606	+19.522	-33.746	Reject
Relative Concentration	1.124	+2.537	-.801	Reject
Absolute Centralization	3.881	-5.193	+2.962	Reject
Spatial Clustering	-67.665	+121.957	-52.810	Reject
Housing QOL				
Dissimilarity	-.377	+3.986	-7.235	Reject
Isolation	.591	-9.146	+12.878	Reject
Relative Concentration	**.343**	**-.366**	**-1.037**	**Accept**
Absolute Centralization	-2.090	+4.089	-1.838	Reject
Spatial Clustering	21.647	-31.749	+10.615	Reject
Social QOL				
Dissimilarity	-.436	+22.234	-14.565	Reject
Isolation	**.306**	**1.112**	**-1.520**	**Accept**
Relative Concentration	4.929	+.370	+3.223	Reject
Absolute Centralization	6.220	-5.890	+7.269	Reject
Spatial Clustering	**-7.120**	**12.751**	**-5.305**	**Accept**
Total QOL (aggregate)				
Dissimilarity	-4.385	+64.516	-78.856	Reject
Isolation	**.545**	**3.059**	**-6.089**	**Accept**
Relative Concentration	8.781	-.312	-4.616	Reject
Absolute Centralization	8.011	-6.994	+8.393	Reject
Spatial Clustering	-176.533	+315.855	-133.593	Reject

Appendix Table A.5. Quadratic Equations for Population Group 2. (Native Americans)				
	Constant	X	X^2	Hyp. (H_1)
Group 2. (Native American)				
Economic QOL				
Dissimilarity	4.637	-38.718	+65.279	Reject
Isolation	.869	-129.846	+560.983	Reject
Relative Concentration	-1.157	+4.799	+.920	Reject
Absolute Centralization	.071	-9.000	+10.999	Reject
Spatial Clustering	481.668	-863.560	+381.433	Reject
Housing QOL				
Dissimilarity	1.047	-4.331	2.650	Reject
Isolation	-.574	+32.360	-79.475	Reject
Relative Concentration	.003	-1.910	-.228	Reject
Absolute Centralization	-.303	.936	-.506	Reject
Spatial Clustering	-73.001	+121.802	-49.036	Reject
Social QOL				
Dissimilarity	10.877	-83.453	+144.500	Reject
Isolation	-.366	-13.967	+127.597	Reject
Relative Concentration	-.650	+2.291	+.507	Reject
Absolute Centralization	.047	-.757	+.900	Reject
Spatial Clustering	5.188	-15.702	+10.011	Reject
Total QOL (aggregate)				
Dissimilarity	23.891	-156.817	230.979	Reject
Isolation	-.071	-111.453	+609.105	Reject
Relative Concentration	-.242	+.737	+.164	Reject
Absolute Centralization	-1.735	-11.360	+18.645	Reject
Spatial Clustering	413.855	-757.460	+342.409	Reject

Appendix Table A.6.	*Quadratic Equations for Population Group 2. (Asians)*			
	Constant	**X**	**X^2**	**Hyp. (H_1)**
Group 2. (Asians)				
Economic QOL				
Dissimilarity	-6.095	+24.519	-26.266	Reject
Isolation	-2.027	+36.926	-115.257	Reject
Relative Concentration	.200	-9.408	+12.935	Reject
Absolute Centralization	.024	-2.335	2.683	Reject
Spatial Clustering	-580.602	+1083.399	-504.461	Reject
Housing QOL				
Dissimilarity	**2.727**	**-13.164**	**+14.922**	**Accept**
Isolation	.520	-16.657	+50.995	Reject
Relative Concentration	-.610	+3.722	-4.549	Reject
Absolute Centralization	-.297	.894	-.535	Reject
Spatial Clustering	492.268	-924.730	+433.068	Reject
Social QOL				
Dissimilarity	7.479	-38.651	+44.665	Reject
Isolation	-1.983	+43.455	-127.297	Reject
Relative Concentration	.526	-5.648	+6.550	Reject
Absolute Centralization	.032	-.950	1.088	Reject
Spatial Clustering	-808.389	+1511.706	-704.937	Reject
Total QOL (aggregate)				
Dissimilarity	1.943	-10.376	12.077	Reject
Isolation	-3.489	+63.724	-191.558	Reject
Relative Concentration	.117	-11.335	+14.936	Reject
Absolute Centralization	-1.817	-19.204	+25.961	Reject
Spatial Clustering	-99.803	185.779	-86.303	Reject

Appendix Table A.7.	***Quad. Equations for Population Group 2. (African Americans)***			
	Constant	X	X^2	Hyp. (H_1)
Group 2. (African – Americans)				
Economic QOL				
Dissimilarity	-20.538	+70.292	-59.558	Reject
Isolation	-2.505	+16.720	-24.720	Reject
Relative Concentration	-3.571	+3.715	+1.271	Reject
Absolute Centralization	-1.189	-9.935	+12.772	Reject
Spatial Clustering	-78.434	+131.490	-55.054	Reject
Housing QOL				
Dissimilarity	5.119	-12.036	+5.075	Reject
Isolation	-.618	+5.951	-9.112	Reject
Relative Concentration	1.917	-1.860	-1.849	Reject
Absolute Centralization	**-.215**	**.995**	**-.819**	**Accept**
Spatial Clustering	-18.351	+31.993	-13.839	Reject
Social QOL				
Dissimilarity	-5.125	+24.125	-26.392	Reject
Isolation	.117	-.058	-.774	Reject
Relative Concentration	-1.615	-.881	+3.633	Reject
Absolute Centralization	.019	-9.138	+10.232	Reject
Spatial Clustering	-28.916	+54.645	-25.678	Reject
Total QOL (aggregate)				
Dissimilarity	-20.544	+82.382	-80.876	Reject
Isolation	-1.600	+21.923	-43.894	Reject
Relative Concentration	-3.269	+.974	+3.054	Reject
Absolute Centralization	-2.887	-11.113	+16.455	Reject
Spatial Clustering	-125.700	+218.129	-94.571	Reject

Appendix Table A.8.	***Quadratic Equations for Population Group 2. (Hispanics)***			
	Constant	**X**	**X^2**	**Hyp. (H_1)**
Group 2. (Hispanic)				
Economic QOL				
Dissimilarity	6.951	-43.623	+53.671	Reject
Isolation	**-.265**	**+4.440**	**-8.468**	**Accept**
Relative Concentration	-2.320	+3.158	+1.992	Reject
Absolute Centralization	-.548	-9.719	+12.856	Reject
Spatial Clustering	76.487	-132.979	+56.402	Reject
Housing QOL				
Dissimilarity	-.125	+1.980	-3.823	Reject
Isolation	1.066	-11.750	+14.042	Reject
Relative Concentration	**.261**	**-.561**	**-.328**	**Accept**
Absolute Centralization	-.211	.844	-6.52	Reject
Spatial Clustering	31.912	-54.727	+23.065	Reject
Social QOL				
Dissimilarity	4.025	-25.952	+32.822	Reject
Isolation	-1.255	+12.964	-19.920	Reject
Relative Concentration	-1.096	+.176	+2.552	Reject
Absolute Centralization	.023	-.764	+.916	Reject
Spatial Clustering	3.070	-10.438	+6.661	Reject
Total QOL (aggregate)				
Dissimilarity	9.975	-53.736	+55.911	Reject
Isolation	-1.228	+3.968	-8.245	Reject
Relative Concentration	-1.325	-1.153	+1.918	Reject
Absolute Centralization	-1.937	-12.894	+19.545	Reject
Spatial Clustering	111.469	-198.144	+86.128	Reject

Appendix Table A.9. Quadratic Equations for Population Group 3. (Native Americans)				
	Constant	**X**	**X^2**	**Hyp. (H_1)**
Group 3. (Native Americans)				
Economic QOL				
Dissimilarity	-4.436	+35.235	-58.028	Reject
Isolation	.094	+39.729	-218.752	Reject
Relative Concentration	.077	+4.004	+.803	Reject
Absolute Centralization	.727	-10.705	+14.139	Reject
Spatial Clustering	-47.761	+90.941	-42.700	Reject
Housing QOL				
Dissimilarity	10.899	-59.426	+68.007	Reject
Isolation	-.185	+18.832	-42.370	Reject
Relative Concentration	.096	-.667	-.075	Reject
Absolute Centralization	-1.967	+7.216	-3.978	Reject
Spatial Clustering	48.499	-86.381	+37.978	Reject
Social QOL				
Dissimilarity	-8.063	+41.010	-58.729	Reject
Isolation	-1.943	+36.750	-196.316	Reject
Relative Concentration	-1.854	+1.671	+.419	Reject
Absolute Centralization	-2.269	-4.336	+7.997	Reject
Spatial Clustering	-86.165	+149.671	-65.204	Reject
Total QOL (aggregate)				
Dissimilarity	-1.600	+16.819	-48.751	Reject
Isolation	-2.033	+95.312	-457.438	Reject
Relative Concentration	-1.681	+5.009	+1.147	Reject
Absolute Centralization	-3.509	-7.825	+18.159	Reject
Spatial Clustering	-85.428	+154.231	-69.925	Reject

Appendix Table A.10.	***Quadratic Equations for Population Group 3. (Asians)***			
	Constant	**X**	**X^2**	**Hyp. (H_1)**
Group 3. (Asians)				
Economic QOL				
Dissimilarity	**3.423**	**-15.354**	**15.393**	**Accept**
Isolation	-.693	+44.905	-204.092	Reject
Relative Concentration	.394	+3.145	-5.231	Reject
Absolute Centralization	.227	-1.669	1.713	Reject
Spatial Clustering	-402.755	+808.290	-405.034	Reject
Housing QOL				
Dissimilarity	-3.742	+14.871	-10.381	Reject
Isolation	-1.438	+51.000	-143.854	Reject
Relative Concentration	-.195	-.019	.748	Reject
Absolute Centralization	-.338	.630	-.038	Reject
Spatial Clustering	-.421.98	+813.478	-391.985	Reject
Social QOL				
Dissimilarity	.930	-6.610	-2.364	Reject
Isolation	-2.729	+42.806	-182.842	Reject
Relative Concentration	-3.374	+3.900	-.488	Reject
Absolute Centralization	-2.451	-5.480	+8.426	Reject
Spatial Clustering	1021.171	-2016.696	+993.930	Reject
Total QOL (aggregate)				
Dissimilarity	17.723	-83.866	+79.615	Reject
Isolation	**-.505**	**+17.152**	**-66.062**	**Accept**
Relative Concentration	-4.540	+6.894	+.261	Reject
Absolute Centralization	-3.794	-10.454	+18.400	Reject
Spatial Clustering	-2757.427	+5301.578	-2546.988	Reject

Appendix Table A.11. Quad. Equations for Population Group 3. (African Americans)				
	Constant	**X**	**X^2**	**Hyp. (H_1)**
Group 3. (African – Americans)				
Economic QOL				
Dissimilarity	14.503	-48.538	+37.919	Reject
Isolation	2.303	-8.263	+1.774	Reject
Relative Concentration	-.103	+.387	+.630	Reject
Absolute Centralization	.254	-1.751	+1.690	Reject
Spatial Clustering	55.605	-86.913	+33.064	Reject
Housing QOL				
Dissimilarity	.400	+7.719	-15.877	Reject
Isolation	-.743	+5.601	-5.819	Reject
Relative Concentration	1.770	-1.711	-1.703	Reject
Absolute Centralization	**-0.175**	**+1.091**	**-.927**	**Accept**
Spatial Clustering	-61.372	+105.435	-44.714	Reject
Social QOL				
Dissimilarity	.411	-1.212	+.228	Reject
Isolation	.170	-1.750	+1.443	Reject
Relative Concentration	-2.439	+1.744	-.457	Reject
Absolute Centralization	-1.775	-5.831	+7.002	Reject
Spatial Clustering	**11.414**	**-18.658**	**7.359**	**Accept**
Total QOL (aggregate)				
Dissimilarity	2.878	-8.337	4.563	Reject
Isolation	.461	-2.427	1.011	Reject
Relative Concentration	-.773	+.420	-1.530	Reject
Absolute Centralization	-1.652	-7.614	+9.724	Reject
Spatial Clustering	13.010	-19.964	7.280	Reject

Appendix Table A.12. Quadratic Equations for Population Group 3. (Hispanics)				
	Constant	**X**	**X^2**	**Hyp. (H_1)**
Group 3. (Hispanics)				
Economic QOL				
Dissimilarity	-2.058	+12.262	-12.184	Reject
Isolation	-.787	+27.879	-65.075	Reject
Relative Concentration	-1.164	+3.531	+2.400	Reject
Absolute Centralization	.116	-1.721	2.113	Reject
Spatial Clustering	-143.653	+262.816	-119.106	Reject
Housing QOL				
Dissimilarity	.472	-1.872	1.037	Reject
Isolation	.176	-.921	-1.33	Reject
Relative Concentration	.184	-.295	-.037	Reject
Absolute Centralization	**-.245**	**+.883**	**-.508**	**Accept**
Spatial Clustering	-50.740	+93.162	-42.433	Reject
Social QOL				
Dissimilarity	-.224	-5.523	+2.323	Reject
Isolation	-.865	-16.496	+33.445	Reject
Relative Concentration	-1.970	+1.664	-.764	Reject
Absolute Centralization	-2.148	-5.061	+7.821	Reject
Spatial Clustering	223.339	-403.017	+178.767	Reject
Total QOL (aggregate)				
Dissimilarity	1.496	-8.234	-1.565	Reject
Isolation	-1.475	+10.463	-31.763	Reject
Relative Concentration	-1.725	+1.848	+.012	Reject
Absolute Centralization	-3.412	-8.326	+16.436	Reject
Spatial Clustering	28.946	-47.039	+17.228	Reject

Appendix Table A.13. Quad. Equations for Population Group 4. (Native Americans)				
	Constant	**X**	**X^2**	**Hyp. (H_1)**
Group 4. (Native - Americans)				
Economic QOL				
Dissimilarity	-13.248	+82.911	-134.673	Reject
Isolation	-.846	-53.855	+285.801	Reject
Relative Concentration	-1.544	+2.608	-2.136	Reject
Absolute Centralization	-2.371	+1.065	+.596	Reject
Spatial Clustering	593.280	-1141.246	+546.631	Reject
Housing QOL				
Dissimilarity	**1.481**	**-8.493**	**+11.172**	**Accept**
Isolation	-.224	+35.945	-150.332	Reject
Relative Concentration	.180	-.256	+.778	Reject
Absolute Centralization	-.368	+.735	-.122	Reject
Spatial Clustering	-114.293	+205.295	-90.874	Reject
Social QOL				
Dissimilarity	-8.391	+28.624	-40.474	Reject
Isolation	-3.160	-70.184	+510.610	Reject
Relative Concentration	-4.247	+3.972	-.516	Reject
Absolute Centralization	-4.838	-3.025	+6.896	Reject
Spatial Clustering	-278.671	+518.862	-244.072	Reject
Total QOL (aggregate)				
Dissimilarity	-9.789	+43.589	-85.773	Reject
Isolation	-4.231	-88.094	+646.079	Reject
Relative Concentration	-5.611	+6.325	-1.873	Reject
Absolute Centralization	-10.156	+3.922	+6.512	Reject
Spatial Clustering	200.316	-417.089	+211.685	Reject

Appendix Table A.14.	*Quadratic Equations for Population Group 4. (Asians)*			
	Constant	**X**	**X^2**	**Hyp. (H_1)**
Group 4. (Asians)				
Economic QOL				
Dissimilarity	5.611	-40.954	+54.802	Reject
Isolation	-2.762	+53.029	-179.176	Reject
Relative Concentration	-.316	-1.619	2.933	Reject
Absolute Centralization	-.948	-8.025	+9.143	Reject
Spatial Clustering	-3165.878	+6104.948	-2942.010	Reject
Housing QOL				
Dissimilarity	1.079	-1.079	-1.489	Reject
Isolation	-.458	+22.541	-27.962	Reject
Relative Concentration	-.357	+.065	+1.864	Reject
Absolute Centralization	-.461	+.555	+.135	Reject
Spatial Clustering	-457.272	+844.469	-387.545	Reject
Social QOL				
Dissimilarity	-.734	-26.575	+46.728	Reject
Isolation	**-.511**	**+8.727**	**-27.026**	**Accept**
Relative Concentration	-.238	-1.444	+2.240	Reject
Absolute Centralization	-3.147	-16.525	+19.577	Reject
Spatial Clustering	**-420.689**	**+808.401**	**-388.224**	**Accept**
Total QOL (aggregate)				
Dissimilarity	5.955	-69.261	+100.040	Reject
Isolation	**-1.029**	**+20.383**	**-60.384**	**Accept**
Relative Concentration	-5.98	-3.055	5.405	Reject
Absolute Centralization	-7.780	-20.107	+29.798	Reject
Spatial Clustering	-1005.494	+1931.451	-927.002	Reject

Appendix Table A.15. Quad. Equations for Population Group 4. (African Americans)				
	Constant	**X**	**X^2**	**Hyp. (H_1)**
Group 4. (African – Americans)				
Economic QOL				
Dissimilarity	11.741	-46.393	+36.715	Reject
Isolation	.091	-1.407	-.422	Reject
Relative Concentration	-4.519	+2.316	+3.465	Reject
Absolute Centralization	-.306	-6.216	+5.666	Reject
Spatial Clustering	**16.290**	**-25.825**	**+9.636**	**Accept**
Housing QOL				
Dissimilarity	-1.358	+11.957	-16.834	Reject
Isolation	.193	+.005	+.615	Reject
Relative Concentration	-.377	+1.455	-.410	Reject
Absolute Centralization	-.461	+.555	+.135	Reject
Spatial Clustering	-37.810	64.902	-27.173	Reject
Social QOL				
Dissimilarity	11.914	-50.277	+34.181	Reject
Isolation	.018	-1.837	+.949	Reject
Relative Concentration	-5.627	+.743	+2.874	Reject
Absolute Centralization	-2.160	-7.957	+7.054	Reject
Spatial Clustering	**12.910**	**-20.682**	**+7.752**	**Accept**
Total QOL (aggregate)				
Dissimilarity	2.704	-10.105	6.644	Reject
Isolation	.133	-3.244	.604	Reject
Relative Concentration	-10.522	+4.514	+5.930	Reject
Absolute Centralization	-5.901	-11.246	+15.145	Reject
Spatial Clustering	**24.475**	**-38.394**	**+13.991**	**Accept**

Appendix Table A.16. Quadratic Equations for Population Group 4. (Hispanics)				
	Constant	**X**	**X^2**	**Hyp. (H_1)**
Group 4. (Hispanics)				
Economic QOL				
Dissimilarity	5.777	-40.962	+50.161	Reject
Isolation	-.124	-.120	-2.756	Reject
Relative Concentration	-.613	.747	.676	Reject
Absolute Centralization	-2.068	-3.771	+6.292	Reject
Spatial Clustering	357.104	-646.056	288.393	Reject
Housing QOL				
Dissimilarity	-1.647	+18.141	-36.869	Reject
Isolation	-.320	+8.229	-6.352	Reject
Relative Concentration	-.025	+.454	+.678	Reject
Absolute Centralization	-.369	+.589	+.009	Reject
Spatial Clustering	-321.939	+591.037	-269.412	Reject
Social QOL				
Dissimilarity	2.212	-26.690	+18.628	Reject
Isolation	-2.697	-16.679	+14.951	Reject
Relative Concentration	-6.036	+4.393	+4.554	Reject
Absolute Centralization	-4.491	-6.353	+10.018	Reject
Spatial Clustering	301.494	-546.367	+241.966	Reject
Total QOL (aggregate)				
Dissimilarity	6.342	-49.511	+31.921	Reject
Isolation	-3.759	-9.170	-7.935	Reject
Relative Concentration	-1.080	1.142	1.111	Reject
Absolute Centralization	-9.514	-5.414	+16.382	Reject
Spatial Clustering	336.659	-601.387	+260.947	Reject

APPENDIX B

APPENDIX B

Appendix Table B. 1. Min / Max Values for Significant Equations					
	Constant (a)	X (b1)	X2 (b2)	Point Y	Point X
Equations	1.39	17.769	-7.74286	11.58447	1.147444
Group 1					
HHRCO	0.343	-0.366	-1.037	0.375294	-0.17647
HSISO	0.306	1.112	-1.52	0.509379	0.365789
HSSPC	-7.12	12.751	-5.305	0.542017	1.201791
HTISO	0.545	3.059	-6.089	0.929196	0.251191
ASISO	0.274	1.994	-2.335	0.6997	0.426981
ASSPC	-44.679	82.231	-37.282	0.664177	1.102824
Group 2					
HEISO	-0.265	4.44	-8.468	0.317003	0.262163
HHRCO	0.261	-0.561	-0.328	0.500879	-0.85518
AAHACE	-0.215	0.995	-0.819	0.087205	0.607448
AHDIS	2.727	-13.164	14.922	-0.17628	0.441094
Group 3					
HHACE	-0.245	0.883	-0.508	0.138705	0.869094
AAHACE	-0.175	1.091	-0.927	0.146004	0.588457
AASSPC	11.414	-18.658	7.359	-0.41237	1.267699
AEDIS	3.423	-15.354	15.393	-0.40577	0.498733
ATISO	-0.505	17.152	-66.062	0.608314	0.129817
Group 4					
AAESPC	16.29	-25.825	9.636	-1.0131	1.340027
AASSPC	12.91	-20.682	7.752	-0.88467	1.333978
AATSPC	24.475	-38.394	13.991	-1.86513	1.372096
ASISO	-0.511	8.727	-27.026	0.193512	0.161456
ASSPC	-420.689	808.401	-388.224	0.145478	1.041153
ATISO	-1.029	20.383	-60.384	0.691103	0.168778
NAHDIS	1.481	-8.439	11.172	-0.11264	0.377685

APPENDIX C

APPENDIX C

Appendix Table C. 1.	***Trend Results for Population Group 1.***				
	P	Y	X	Value	Trend
Hispanics					
(Housing QOL)					
Relative Concentration	.001	.375	-.176	Maximum	Downward
(Social QOL)					
Isolation	.002	.509	.365	Maximum	Downward
Spatial Clustering	.001	.542	1.202	Minimum	**Upward**
(Total QOL)					
Isolation	.001	.930	.251	Maximum	Downward
Asians					
(Social QOL)					
Isolation	.001	.670	.426	Maximum	Downward
Spatial Clustering	.001	.664	1.10	Minimum	**Upward**

Appendix Table C. 2.	***Trend Results for Population Group 2.***				
	P	Y	X	Value	Trend
Hispanics					
(Economic QOL)					
Isolation	.001	.317	.262	Maximum	Downward
(Housing QOL)					
Relative Concentration	.001	.501	-.855	Maximum	Downward
African Americans					
(Housing QOL)					
Absolute Centralization	.001	.087	.607	Minimum	**Upward**
Asians					
(Housing QOL)					
Dissimilarity	.001	-.176	.441	Minimum	**Upward**

Appendix Table C. 3.	***Trend Results for Population Group 3.***				
	P	**Y**	**X**	**Value**	**Trend**
Hispanics					
(Housing QOL)					
Absolute Centralization	.001	.139	.869	Minimum	**Upward**
African Americans					
(Housing QOL)					
Absolute Centralization	.001	1.091	-.927	Maximum	Downward
(Social QOL)					
Spatial Clustering	.001	-.412	1.268	Minimum	**Upward**
Asians					
(Economic QOL)					
Dissimilarity	.001	-.406	.500	Minimum	**Upward**
(Total QOL)					
Isolation	.001	.608	.130	Maximum	Downward

Appendix Table C. 4.	*Trend Results for Population Group 4.*				
	P	**Y**	**X**	**Value**	**Trend**
African Americans					
(Economic QOL)					
Spatial Clustering	.001	-1.013	1.340	Minimum	**Upward**
(Social QOL)					
Spatial Clustering	.001	-.885	1.334	Minimum	**Upward**
(Total QOL)					
Spatial Clustering	.001	-1.865	1.372	Minimum	**Upward**
Asians					
(Social QOL)					
Isolation	.001	.193	.161	Maximum	Downward
Spatial Clustering	.001	.145	1.04	Minimum	**Upward**
(Total QOL)					
Isolation	.001	.691	.169	Maximum	Downward
Native Americans					
(Housing QOL)					
Dissimilarity	.001	-.113	.378	Minimum	**Upward**

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