Majority’s Perception of Minority Groups vis-à-vis Housing Values within the San Juan, MSA: A Local variation Approach

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by

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Chapter 1

Contextualizing Housing

Introduction

Housing is one of the most important components in the urban landscape and is one of the most basic human needs (see Carter et al., 2005). However, the benefits that housing can bring go beyond simple shelter. For instance, the acquisition of a house is often a dream of families across all income levels.

Adequate housing provides security and a base for social relationships. Haurin and Brasington suggest that homeownership increases children’s opportunities to graduate from high school and college (1996, p. 6). Many families in modern societies also consider housing as an investment. As pointed out by Massey and Denton “one of the primary means by which individuals improve their life chances is moving to neighborhoods with higher values” (1993, p. 38). Also, Dietz and Haurin suggest that an increase in the property homeownership rate in an area has a positive association with changes in property values (2003, p. 404). For the majority of the families in the United States, as well as other countries, housing is the primary form of financial investment. The return on
this investment is considered housing value appreciation: the gain in property value from purchase price to resale price

“The importance of neighborhood in the operation of housing and mortgage markets is indisputable because housing is fixed in geographic space” (Can, 1998, p. 61). Anselin links the importance of housing to geography, arguing that “one … characteristic that differentiates housing from other commodities is locational fixity” (Anselin, 1998, p. 113). Simply put, housing value appreciation is of interest to geographers because housing markets are spatial. Each housing unit is located in a unique space. These spaces are organized at different levels producing groups of housing units called neighborhoods. Initial home cost and resale price vary across these spatial units.

Although location is an important variable in determining property value, it is not the only one. Studies in housing can involve many factors. For instance, “old houses may have a premium attached to the price because the uniqueness and their proven ability to survive, which could be linked to quality” (Smith, 2004, p. 174). There is evidence of a relationship between housing age and housing value. For example, one study suggests a positive relationship between age and housing value after the first sixteen to twenty years of the life of the house (see Quang Do and Grudnitski, 1993). Since incomes vary significantly by many social characteristics, such as race or ethnicity, differences in initial home cost and resale price influence who can afford a home and where that home is
located. Housing values, in turn, can be affected by racial and ethnic characteristics of an area. Numerous studies (e.g. MacPherson and Sirmans, 2001; Kim, 2000; Harris, 1999; Quercia et al., 2000; and King and Mieszkowski, 1973) suggest a relationship between race and ethnicity, and housing value. Schnare (1974) argues that externalities arise when a household’s satisfaction depends on the characteristics of its neighborhood; demographic externalities refer to the influence of the demographic mix of an area on a household’s evaluation of neighborhood quality.

Historically, race, ethnicity, and as we will see, nationality, have been used to economically, politically, or socially isolate or segregate minority groups. Segregation problems occur in many societies and the processes supporting segregation are diverse. Depending on the political structure of a country, the government itself is often willing to promote segregation through *de jure segregation*, which is racial segregation that occurs as the result of legal measures.

This can be illustrated by two examples. First, in South Africa the government explicitly supported and codified segregation. However in the United States segregation was implicitly supported, at least in recent history, by the government and financial institutions in the form of planning regulations (e.g. zoning) and unofficial lending policies resulting in “red-lining” (see Kaplan, Wheeler, and Holloway, 2004; Reibel, 2000; Massey and Denton, 1993; Abrams, 1955). Regardless of the process by which segregation is promoted, it affects the
minority population in social, economic, and political terms. In other words, segregation is spatially reflected in areas such as housing, employment, education, and recreation among others. In summary, segregation reduces access to educational and job opportunities, consequently, reducing the probabilities of wealth accumulation, which might feed back into increased segregation.

Purpose of Dissertation

The premise of this dissertation is that perceptions and attitudes about nationality, as part of neighborhood effects, may influence housing values. This dissertation considers nationality as well as neighborhood characteristics in analyzing housing values within the San Juan metropolitan area of Puerto Rico. This research also explores the majority group’s attitudes toward minority groups to provide understanding of the quantitative analysis.

The first objective is to explore the patterns of median housing values related to Cubans, Dominicans, Afro-Puerto Ricans and Puerto Ricans by census tract. This objective explores whether the percentage of minority corresponds with variations in median housing values. A scatter-plot is used to explore these patterns.

The second objective of this research is to identify spatial clusters of Cubans, Dominicans and Afro-Puerto Ricans within the study area. The study
employed the Gi* statistic to locate spatial clusters with higher or lower concentrations of minorities than one might expect to find by random chance.

The third objective is to assess the impact of neighborhood effects on housing. Housing values are influenced by numerous characteristics of the property and surrounding areas. This section of the research focuses on neighborhood characteristics which could impact, either positively or negatively, housing values. The relationship between these neighborhood characteristics and housing values is examined using both global and local regression analysis.

Finally, this research assesses attitudes and perceptions in different neighborhoods about race and nationality using a survey instrument. A survey instrument was used to examine specific demographic aspects, perceptions about neighborhood characteristics, and the participant’s perceptions about housing values for four groups: Cubans, Dominicans, Blacks (Afro-Puerto Ricans), and Whites (Puerto Ricans). The survey provides context to the quantitative analysis.

This study suggests that nationality is one of several factors influencing housing values within the San Juan MSA, Puerto Rico. The study addresses other neighborhood characteristics that are associated with housing values. In addition, this study suggests that distance reinforces negative perceptions towards a specific national group.
Organization of the Dissertation

The dissertation is divided into nine chapters. Chapter 1 is an overview of the research while chapter 2 provides a detailed description of the theoretical framework. Chapters 3 and 4 offer background information on the evolution of the human landscape in Puerto Rico and its spatio-cultural dimensions. Chapter 5 focuses on the methodology, while chapter 6 includes a detailed discussion of the data used in the analysis. Chapter 7 presents the statistical results, analysis, and interpretations while chapter 8 presents the survey results, analysis, and interpretations. Chapter 9 presents the conclusions of the research.

Specifically, Chapter 2 examines the benefits of housing as well as the difficulties some groups experience in acquiring a home. It also discusses the theoretical framework of the dissertation, which is based on improvements to Can’s theoretical model of GIS and spatial analysis for the housing and mortgage market (1998). The adaptation of this theoretical model to a Latin American context and the acquisition of original field data uniquely contribute to the body of housing research.

Chapter 3 examines the island of Puerto Rico in a Caribbean migratory context. This chapter explores the ethnic landscape in Puerto Rico and how it has evolved from multiple waves of migration. The chapter provides a brief discussion of the different indigenous groups that inhabited the island, the racial
dynamics on the island and the development of the Puerto Rican concept of national identity.

Chapter 4 introduces the reader to the concept of racialization in Puerto Rico. In addition, it presents a contemporary view of Puerto Rico’s dominant group and minority groups - Afro-Puerto Ricans, Cubans, and Dominicans. It offers a review of the most common patterns of segregation as well as common problems produced by segregation. This chapter ends with a brief discussion of the interaction in housing markets involving minorities and provides a schematic view of those interactions that shape space in Puerto Rico.

Chapter 5 discusses the research methods used in similar housing research, outlines the research questions for the dissertation and presents the research methods used in the dissertation. The methods used in this dissertation were scatterplots, Gi* (Gi star), Ordinary Least Squares regression (Global Regression), Geographically Weighted Regression (GWR) and a person to person survey instrument.

The data used in this research are presented in Chapter 6. Data from the U.S. Census were employed to perform the statistical analysis (scatterplot, Gi*, OLS, and GWR. This chapter outlines the variables used for each of the statistical techniques. In addition, it presents the survey instrument used to gather data in the field as well as the study area in which the survey was carried out.
Chapters 7 and 8 present the results of the research. Chapter 7 focuses on the findings for the statistical analysis while Chapter 8 focuses on the results of the survey instrument. Chapters 7 and 8 also offer interpretations of the results. Finally, chapter 9 offers the conclusions of this research.
Chapter 2

Theoretical Framework

Introduction

It is important to place the study of housing values in a broader context to understand the impact of housing on human beings and human geography. Housing is one of the most important components in the human landscape, it provides security for families as well as a common place for social relations, and is, perhaps, the biggest investment for many families. Housing can be studied from many perspectives from simple and individual to complex and collective aspects.

In one sense, housing might be seen as simple and individual because it is in many cases a simple structure used primarily to provide shelter and very often is part of a conglomeration of units such as a neighborhood. However, viewed from a more complex perspective, a housing unit is an essential part of the family structure providing a basis for its social interaction. Arguably, housing is the basis of society. Housing is complex and collective because it is associated with socio-economics, politics, culture, and other life events that might affect not only
one but many families. Consequently, housing might simultaneously impact individuals and society.

Benefits of Housing Ownership

There is little disagreement that homeownership provides many benefits to society and in recent history in the U.S. significant efforts are underway to increase homeownership rates. However, the impacts to society when there are barriers to homeownership are not explored as often. These negative impacts to society are not limited to just the housing market. For example, housing provides society with benefits that might have multiplier effects. In fact, Santiago argues:

Barriers to open access within the housing market are perceived to have a domino effect on the kinds and numbers of jobs opportunities that are available, the quality of schools, the availability of medical care, and the presence and quality of public services such as recreational facilities, police protection, and sanitation (1992, p. 109).

However, there are problems related to poor quality of housing as well as racial and ethnic groups that suffer from scarce housing scenario possibilities.
Therefore, this section discusses some of the benefits as well as problems related to housing and minority groups. The discussion is thematic rather than individual or collective since the themes overlap with each other.

Behavior Adjustments prior to Homeownership

Behavior is the way in which people conduct their actions. Any given action might be constrained due to different factors. In fact, households’ behaviors change when planning to become homeowners due to the twofold interpretation of a housing unit as both an investment durable good and a consumption good. Because homeownership requires a down payment and other related costs there are several behavioral adjustments to savings, living arrangements, consumption, and childbearing that are often associated with efforts to achieve this goal.

For example, potential homeowners may decide to wait longer while saving money for a down payment, change their savings habits, or decide on a smaller house (Engelhardt, 1994). Haurin, Hedershott, and Watcher (1996) argue that in the pursuit of homeownership childbearing is often postponed due to the austere period of preparation required to cover costs. In addition, Haurin, Hedershott, and Watcher find that saving habits changed mainly in the two years prior to the acquisition of the first housing unit (1996). Furthermore, there are an increasing number of homebuyers who rely on gifts as a means to provide a
down payment, which might suggest difficulty in saving money for a down payment (Mayer and Engelhardt, 1996). Such gifts included wedding presents or inheritances. However, such gifts are more likely as the education level of the parents increases (e.g. Mayer and Engelhardt, 1996).

Young adults can also benefit by living with their parents as a means to save money (e.g. Haurin, Hendershott, and Kim, 1994). Ermisch and Di Salvo (1997) suggest that young adults, especially women, stay longer in their parents’ home when dwelling unit costs are tight. It is possible to argue that young adults who live in their parents’ house for an extended period enhance their ability to save money for a down payment of a housing unit.

*Homeownership and Household Mobility*

Many studies show that homeowners are less likely to move out of the neighborhood than renters. Rohe and Stewart (1996) used data from the U.S. Census of Population and Housing to examine the relationship between homeownership and neighborhood stability. They suggest that less residential mobility and greater property values result when there are greater proportions of homeownership. Aaronson (2000) also suggests that homeownership effects are associated with residential stability. Residential stability also appears to be correlated to educational attainment (Aaronson, 2000).
On the other hand, reasons other than homeownership can reduce residential mobility. Chung and Haurin (1998) suggest that household consumption and a lack of mobility, responds to the user cost of owning a housing unit. Similarly, Kan (1999), based his longitudinal study (1979-1987) on data from the Panel Study of Income Dynamics, reported that unanticipated socio-economic changes might impact residential mobility.

**Homeownership and Community Involvement**

Many studies point out that community involvement is important for the relationship between homeownership and the lack of residential mobility. The reasons behind homeowners tending to live longer in the same neighborhood than renters are related to their shared interest in the maintenance of housing quality. Therefore, homeowners tend to be more committed to community associations (Rossi and Weber, 1996)

However, homeowners are motivated to engage not only in housing maintenance but also in other activities that could benefit the community such as social activities and political activism. In addition, as Rohe and Stuart (1996) argue:

“Unlike renters and landlords, [homeowners] have both economic and use interest in their properties. This combination of interests
seems to provide powerful incentives for owner-occupants to maintain their properties at a higher standard and join organizations that protect the collective interest of homeowners in the area” (p. 71).

De Souza (1999) supports a similar argument in his study of Recife, Brazil, in which he noticed that other variables, such as saving capacity, affect the likelihood of housing improvements. Rohe and Stuart (1996) further suggest an association between homeownership, improved property maintenance and longer lengths of tenure. People who own a housing unit are more likely to invest in them than those who rent a housing unit.

Homeownership can also ripple through other aspects of society. For example, homeownership by a parent increases the likelihood of their children becoming homeowners. In addition, homeowners tend to be more productive in the workplace. Therefore, a positive multiplier effect is expected for a society which experiences an increase in homeownership (Boehm and Scholttman, 1999)

These examples illustrate the many aspects in which housing impacts society. Basically, homeownership produces a chain reaction which enhances a community’s situation and has an impact on the future of the residents’ children.
Homeownership and Public Health

Homeownership has also been associated with aspects of public health. Stewart and Rhoden (2006) suggest that there is a strong connection to public health:

Benefits to health should focus around the availability of housing, quality and environmental safety to promote public health and reduce inequalities. In addition to physical housing provision and availability, it is important to reducing homelessness, promote community development, enhance social networks, ensure mixed housing environments, energy efficiency, home safety and removal of hazards (p. 338).

Haurin, Parcel and Haurin (2002) argue that homeowners investing in home improvements are improving the house environment and consequently producing a healthy habitat. In addition, homeowners may take advantage of resources such as home equity or reverse mortgages that can be used to pay for medical health care (e.g. Rasmussen, Megbolugbe, and Morgan, 1997).

Rossi and Weber (1996) explored evidence from the General Social Survey and the National Survey of Families and Households to determine whether homeowners differ from renters in terms of public health. They suggest that
homeowners are more satisfied in life and tend to have better levels of emotional health. In general homeowners tend to have greater income and wealth than renters. Since there is empirical evidence that homeownership is positively and significantly associated with wealth accumulation over time (e.g. Di, Belsky, and Liu, 2007), perhaps it is not surprising that homeowners’ health tends to be better than that of renters.

*Homeownership and Educational Attainment*

As mentioned above, homeownership also produces positive outcomes for children. Specifically, for children in low-income families homeownership increases educational achievements (Harkness and Newman, 2003). The secure environment that housing can offer seems to trigger the possibilities of children’s educational attainment (e.g. Green and White, 1997 and Aaronson, 2000). Therefore, children from homeowner’s families are less likely to quit school (Green and White, 1997). Additionally, children from homeowner’s families tend to score better on standardized tests (Haurin, Parcel, and Haurin, 2002). Boehm and Schlottmann (1999) also reported that homeowners’ children are more likely to achieve higher levels of education. Their longitudinal study (1968-1992) used the Panel Study of Income Dynamics data to investigate the relationship between children’s educational attainment and housing choices once they became adults.
Homeownership and Minority Groups

Housing is an investment for many families. Housing represents the most important contribution to the minorities’ wealth, generally over 60 percent for both blacks and Hispanics (McCarthy, Van Zandt, and Rohe, 2001). Consequently, housing value change affects, either positively or negatively, a household’s wealth. Kim (2000) studied home price appreciation rates in Milwaukee, Wisconsin, for a 22 year period, and suggests that appreciation rates are lower in areas with greater minority population. Consequently, homeownership and housing value might impact the urban morphology and human geography of an area. Crump (2004) argues that segregated residential structures in the United States are indicators of discrimination and reduce the opportunities of minority groups. Thus, not every person has equal opportunities to become a homeowner. There are numerous examples in the literature that point out disparities among racial or ethnic groups (e.g. Galster, 1991; Gyourko et al., 1999; Choudhury, 2001; Denton, 1967; Gotham, 2002; and Crump, 2004) as well as numerous studies on residential segregation focusing on housing values (e.g. Emerson et al., 2001; Kiel and Zabel, 1996; Oliver and Shapiro, 1995; Page, 1995; Long and Caudill, 1993; Blau and Graham, 1990; Follain and Malpezzi, 1981; Farley, 1977; Daniels, 1975; and King and Mieszkowski, 1973). Many of the studies report differences in housing values

King and Mieszkowski (1973) present estimates of racial discrimination in the New Haven, Connecticut housing market using data gathered from a special survey of rental units. They used multiple regression techniques to explore differences in amounts paid for similar units among blacks and whites. For this study the following variables were used: monthly rent, apartment’s area, square feet divided between the number of rooms, distance in miles from New Haven Green, score of local elementary schools, race and sex of household’s head, education of household’s head. These variables correspond to different factors of neighborhood effects such as accessibility, social - economic - demographic context, and public services provision.

Daniels (1975) investigates the influence of racial segregation on housing prices in Oakland, California. His study was done using U.S. Census of Population and Housing data for 1960 at the census tract level, as well as Land Use data from an unpublished survey conducted by the Bay Area Commission in 1965. The independent variables used for this work were: median number of
rooms per unit, percentage of units with basement, percentage of units with a bathroom, percent of unit built before 1940, lot size, land elevation, travel time, a dummy variable denoting census tract with high and above average concentration of employment, and school’s score. Daniels (1975) suggests that the black submarket is more costly in comparison to the white submarket.

The study of Follain and Malpezzi (1981) uses hedonic models to explore differences in payment for housing units between blacks and whites. Their study suggests that “whites pay a premium for housing in predominantly white neighborhoods” (p. 203). This study covers 39 large Standard Metropolitan Statistical Areas (SMSA).

Emerson et al. (2001) suggest that African American composition affects the likelihood of homeownership on Anglo Americans. Yinger (1998) maintains that ethnic discrimination still being experienced in the housing market by ethnic minorities. Yinger (1998) reported housing agents showing fewer housing units to African-Americans and Hispanics than Anglo-Americans. Page (1995) supports this argument. She demonstrates that real estate agents show ten to twenty percent fewer housing units to their African American and Hispanic clients proportionally to Anglo American. Consequently, the ability of minorities to improve their lives through investing in real estate is limited. Blau and Graham (1990) argue, “racial differences in inheritance and other inter-generational transfers most likely play and important role in well being” (p. 338).
Throughout time, these constraints have a deep impact on the well being of minority groups.

Acquisition of a home has historically been a problem for minority groups in many parts of the world. In the United States, the Association of Real Estate Boards used economic, social, political, and legal power to segregate (e.g. Denton, 1967 and Gotham, 2002). Segregation and discrimination negatively impact the homeownership opportunities of minority groups. The homeownership options for minority groups were reduced to marginal areas (Crump, 2004). Thus, it is probable that when we negatively affect the opportunities of minority groups we are negatively affecting the opportunities of the whole society.

More findings on housing problems are presented by Rossi and Weber (1996). They indicate that Blacks and Hispanics are less likely to be owners on any socio-economic level. In addition, immigrants and minorities occupied worse quality housing units in comparison to whites and native born (Schill et al., 1998).

Many methods of exclusion have emerged. Harassment, as well as economic, political, and social isolation are used to discourage the inclusion of minorities in society, and thereby force them to live in substandard conditions. Foreigners experience these types of abuses in many countries around the world, including in the more free and democratic societies.
One example of how even private institutions control minorities’ settlement patterns was seen in Ohio. The Sheffield Land Company was a private institution that shaped the settlement pattern of Puerto Ricans in Lorain, Ohio. Rivera (1986) describes how Puerto Ricans found themselves in a situation where nobody in the area would sell them a house. The only way in which Puerto Ricans could become homeowners was by purchasing at prices higher than the market value and later renovating the dwelling units. This example illustrates that even when minorities do have economic resources, their homeownership opportunities are sometimes still limited due to their status as minorities.

Thus, the majority’s attitude toward minorities can perpetuate a process of segregation and disadvantage them, possibly leading to a negative social impact not only for the minority groups but also for society. Therefore, an examination of housing value should incorporate issues of race and ethnicity. Furthermore, an examination of the spatial patterns of minority group residences may help to identify problems in which housing values could be affected by the perceptions of residents in spatial proximity to a minority neighborhood. In this way, relative location and neighbors’ perceptions can influence housing values (Can, 1998). Massey and Denton (1993) point out the existence of Anglo-American apprehensions about racial mixing in relation to weak property values and security.
In fact, Massey and Denton (1993) present a survey of attitudes (see Farley, 1977) in which the majority of white respondents indicated their willingness to live in a practically all white neighborhoods. The study identifies segregation as an important issue. Other studies also support this idea. For example, Harris finds that “houses lost at least sixteen percent of their value when located in neighborhoods that were more than ten percent African American” (1999, p. 476). The data used in this study are from the Panel Study of Income Dynamics (PSID), a longitudinal survey conducted annually by the Survey Center of Michigan which analyzes data from the 1980s. Harris examined the following variables: monthly rent, number of rooms, single-family unit -or not-, homeowner, non-Hispanic white -or not-, and the ‘area’ such as Northeast, South, and so on, which were acquired from the PSID. The following variables from the 1980 Census were also used: metropolitan area population, percent black, income, percent poor, percent with no education, percent unemployed.

However, other scholars identify the effects in racial/ethnic change as having more influence than racial/ethnic composition as factors influencing housing values. MacPherson and Sirsman (2001) suggest that house value is affected more by the change in racial/ethnic composition than in the ethnic composition itself. Their study examines changes in house prices relative to the level of and change in percent of racial/ethnic composition in Orlando and
Tampa, Florida. This study brings into view the variable of Hispanic origin. This is important because as of the 2000 U.S. Census, the Hispanic population became the largest minority in the United States. This work used data from the U.S. Census for 1970, 1980, and 1990 as well as data from the Florida Department of Revenue for the period 1971 to 1997.

For Hispanics the problem of a language barrier in the United States is also present. Dávila, Méndez y Mora (2003) argue that, “foreign-born Hispanics, who often have limited-English proficiency, as well as bilingual Hispanics, who reside in states that passed English-only legislation, were less likely to acquire a home compared to their counterparts in other areas” (p. 40).

Summary

This chapter provided general background information on the topic of housing and how housing can both impact society and be impacted by society. The majority of the literature on housing is written from the perspective of an Anglo-American market. Since the study area of this dissertation is an island the housing market and its relationship with minority groups must be explored within the cultural context of Puerto Rico. The next chapters describe the evolution of the ethnic landscape in Puerto Rico and the spatial and cultural consequences that have resulted.
Chapter 3

Evolution of the Puerto Rican Ethnic Landscape

Introduction

This brief chapter first provides a conceptual framework through which migration processes in Puerto Rico can be viewed, and also provides background information on each of the major immigrant groups. In this work I distinguish three major stages of migration: 1) the pre-Columbian culture migration, encompassing the period from the Arcaicos culture to the Taino culture, 2) the conquest period, which includes the European conquest and the African slave trades, 3) a contemporary period that includes the migration processes identified with as the increase in Cuban and Dominican migrants.

The Caribbean as a Pathway for Migration

The Caribbean has been a region of constant migration. The evolution of Puerto Rico as an ethnic landscape should be analyzed in this regional context: as an island in the middle of the Caribbean archipelago. The Caribbean can be considered a bridge of islands that connects South America and North America, via the Yucatan Peninsula, that has served as a passageway in the migration
processes of Puerto Rico. Puerto Rico, as a Caribbean island, has been influenced in large part by the region’s history of migration. A variety of different ethnic groups have inhabited Puerto Rico, such as the Araucanos and the Igneris (pre-Columbian indigenous populations), Europeans, Africans, and Anglo-Americans among others (Fernández-Cobo et al., 2001).

Conceptual Framework for Migration in the Caribbean

Given that Puerto Rican migration spans from pre-Columbian times to the modern day, it is difficult to articulate a single conceptual framework that can encompass all of the various waves of migration to the island. However, Faist (2000), in a comprehensive review of the dominant theories of international migration, provides a useful model for understanding the reasons why people migrate. Arguably, understanding the reasons why a group of people migrate can lend great understanding to how and if these people will be assimilated into the host culture. Faist’s model is an interpretation of Parson’s (1951) sociological systems theory known as AGIL – adaptation, goal attainment, integration and latent pattern maintenance (Figure 1).
The adaptation component of the Faist’s model illustrates one of the most basic motivations for migration, that is, that the origin location does not provide enough resources or facilities for basic human needs (Faist, 2000). The migrant is responding or reacting to some ecological change at the origin location (e.g. famine, drought, or overpopulation) by seeking new areas that have sufficient resources to meet basic human needs. The second motivation, goal attainment, materializes when some goal, often economic in nature, can’t be met within the origin society. Here, basic human needs may be met but economic or social
advancement is not attainable in the origin society often due to some restriction or control by the governing political structure. A historical example of goal attainment as a motivation for migration can be found in several Caribbean nations where crown lands – large tracts of property held exclusively by the colonial power – created land scarcity and thus motivated migration to areas where land ownerships was more attainable (Manigot, 1983, p. 14). The third motivation for migration, integration, occurs when a migrant can’t be fully integrated into the origin society. Faist (2000) describes this as occurring when “a potential migrant’s aspiration to solidarity cannot be fully gratified in the emigration nation-state. He cannot fulfill the goal of complete mutual identification with other persons and with the society as a whole” (p. 49). The final motivation for migration, latent pattern maintenance, is the most difficult to describe. Here, the origin society is striving to protect and maintain some minimal social structure and order. If a potential migrant does not adhere to the existing social order or structure then migration may be the only option for achieving a “worthwhile and sincere pattern of life” (Faist, 2000, p. 49). An example from the recent past is the communist controlled Soviet Union where religious freedom was nearly non-existent. In this case, for example, practicing Jews had no choice but to emigrate since the state took great efforts to maintain the existing structure of atheism.
Although the four migration processes presented above were illustrated individually, Boyd (1989) sees migration not as a one-time static event but as a process comprised of a sequence of events occurring across time. This idea is further illustrated by Magobunje (1970) who describes the understanding of migration evolving from linear, unidirectional, push-pull, and cause-effect concepts to more rich circular, interdependent, progressively complex and self-modifying concepts. Parson’s original AGIL social systems theory is consistent with this view. He saw the processes of adaptation, goal attainment, integration and latent pattern maintenance, at least in a sociological context, as being interrelated. It is in this conceptual framework that the migration history of Puerto Rico will be presented in the next sections that discuss the Pre-Columbian migrations, the Spanish conquest, and the contemporary migrations of Cubans and Dominicans.

The Pre-Columbian Culture Migration

This period refers to pre-Columbian indigenous groups who settled the island before the arrival of Columbus and other European conquerors. The principal indigenous groups that settled the island were Arcaicos, Saladoïdes, Ostionoides, and the Taínos. The reason Puerto Rico was the target of these indigenous groups was due, in part, to the fact that there are no impassable mountains or un-navigable bodies of water which serve as natural barriers across the Caribbean region. Migration toward Puerto Rico is aided by the Caribbean
current and associated winds which flow northward into the Caribbean Sea from South America (Maingot, 1989). It is these favorable natural conditions which enabled indigenous groups to settle the island before Columbus and European conquerors arrived.

**Archaic**

It is possible to assert that there were cultural groups inhabiting the area of the Caribbean by 2000 B.C. This estimate is based on the fact that most radiocarbon dates of human artifacts belong to the period after 2500 B.C. and the earliest date in the Caribbean is around 2000 B.C. Nevertheless, these dates are not definitive but suggestive (Allaire, 1997).

The first cultural group was identified as the Archaic, which literally means archeaic or ancient. The Arcaico cultural group lacked agricultural knowledge. The Arcaicos are thought to be the earliest migrants into the Caribbean. Alegria, Nicholson, and Willey (1955) summarize the archeological record of the Archaic this way:

There is ample evidence, both archaeological and historical, that the West Indies were first occupied by people who followed a non-agricultural way of life. This mode of life has been referred to as the West Indian Archaic cultural tradition. Archaeological remains
of this tradition are well represented in Cuba and Hispaniola, and they have been reported from Bahamas, Puerto Rico, the Virgin Islands and Trinidad (p. 120).

The earliest evidence based on artifacts found in Cuba and La Hispaniola are similar to those found in the Yucatan peninsula [and Central America] leading scientists to suggest that Archaic were coming from this area. However, there are other scientists that connect the Archaic’s artifacts with those in North America (Florida) and Bahamas (Wilson in Bercht et al, 1997, p. 15).

The geographical distribution of the Archaic in Puerto Rico was limited to scattered areas in the islands (Figure 2). Generally known as fishermen and collectors, the Archaic populated the Caribbean region around 2,000 B.C. (see Figure 3) although some researchers argue that the Archaic peoples may have appeared as early as 4000 B.C. Nevertheless, there is no clear transition among periods (Wilson in Bercht et al., 1997).

Saladoid

The second group of pre-Columbian people was the South American Holticulturists known as Saladoid due to the archeological discovery of remains in Saladero, Venezuela (Siegel in Bercht et al., 1997, p. 109). Radiocarbon dating points to the period between early 400 B.C. and 200 B.C. for their settlement. The
Saladoid displaced or absorbed the earlier cultural group (Archaic). It is believed that they migrated from the Orinoco River to the minor Antilles and, subsequently, to Puerto Rico (Figure 3).

The Saladoid, unlike the Archaic, had agricultural knowledge, leading scientists to suggest that the Saladoid lived in larger groups than the Archaic. Although the Salaloids gathered wild food, they also cultivated the land (Wilson in Bercht et al., 1997). Some of the most important archaeological sites of the Saladoid culture are shown in Figure 2. For the most part these archaeological sites are located around the coast of Puerto Rico (Wilson in Bercht et al., 1997). The Saladoid’s arrival suggests the earliest proof of invasion and succession on the island. Like the Archaic, the Saladoid operated under a subsistence economy and most likely migrated as a result of adaptation.

**Ostionoid**

A transition period occurred in Puerto Rico generally from A.D. 500 to 1000. The main archaeological site was in Barrio Punta Ostiones in the town of Cabo Rojo, and therefore the settlers were given the name of Ostionoides. For some scholars, the Ostionoides are just a transition from Saladoide to Taíno (Wilson in Bercht et al., 1997). In fact, this is a period of cultural change and consolidation. Scholars are divided between two theories: one that points to inland migration and other that points to an evolution from the mixture of the
Salaloid and the Archaic (Wilson in Bercht et al., 1997). The archaeological sites of the Ostionoid are shown in Figure 2.

_Taíno_

The most important and most recent of the indigenous groups is the Taíno, who emerged in Puerto Rico circa A.D. 1000. The Taínos had a more complex social organization than previous indigenous groups. Nevertheless, “their society emerged as a continuation of the cultural development that had characterized Caribbean history for several thousand of years” (Wilson in Bercht, 1997, p. 17). Geographically, Taínos were located in the following areas: Loíza, Canóvanas, Vieques, Humacao, Yabucoa, Luquillo, Caguas, Cayey, Guaynabo, Toa Baja, Jayuya, Juana Díaz, Utuado, Guánica, San Germán, Mayagüez, and Aguada among other (see Figure 2).
Figure 2. Major Archeological Sites in Puerto Rico
The Taíno were an important influence in the Caribbean. According to Ricardo Alegría (1997):

Traces of Taíno are evident today in the physical appearance of the Caribbean population and in the survival of many indigenous words that were incorporated into Spanish during the conquest. The original Taíno names for many geographical areas, plants, trees, fruits, and objects … have since become common in English and other European languages (p. 18).

This strong influence is reflected in words such as barbeque, canoe, hammock, hurricane, tobacco, casabe, yuca, conuco, and guayo. Furthermore, Taíno ancestry is strongly rooted in the Puerto Rican society. Martínez-Cruzado et al., 2001 argue that in Puerto Rico, the contribution of Taíno culture to the legacy of the island is present beyond vocabulary or objects and includes Taíno feature traits. According to their study the Taíno heritage is present among the majority of the Puerto Ricans.

The Taíno culture rapidly vanished with the arrival of the Spaniards in the Caribbean. Indeed a dramatically decrease in the Taíno population occurred in the first decades after the arrival of the Spaniards (Alegría in Bercht at al., 1997).
The Spanish Conquest and Introduction of African Slaves

Explored from the perspective of Faist’s migration model, the Spanish conquest of Puerto Rico falls clearly into the *goal attainment* category. In contrast to the initial religious motivations for colonization of North America by the British, the Spanish were motivated by financial gain – particularly the acquisition of gold. The conquest of Puerto Rico began on November 19, 1493 when Christopher Columbus on his second voyage to the New World, claimed the island for the Spanish crown (see Figure 3).

The Spaniards largely ignored the island until 1508 when Juan Ponce de Leon established the first mining and agricultural activities on the island. The Spanish colonizers subjugated the native Taino population. The cruel treatment by the Spanish, coupled with the introduction of new diseases by the Europeans lead to a drastic reduction in the Taino population. By 1530 gold production had fallen off, resulting in the exodus of many of the Spanish conquerors. The remaining Spanish on the island switched to the labor intensive production of sugarcane and ginger.
Figure 3. Major migrations in the Caribbean
Figure 4. Selected Trans-Atlantic Slave Trip Voyages to Puerto Rico 1527-1842
The decline of the Tainos and the high labor demands of the sugarcane plantations lead to an increase use of African slaves. Although quantitative data for this early time period are difficult to obtain, records of trans-Atlantic slave trip voyages to Puerto Rico show a steady increase in slave disembarkations after 1530, a peak in 1770, and then a decline throughout the latter half of the 19th century (Figure 4). Slavery was officially abolished in Puerto Rico by the Spanish National Assembly on March 22, 1873. Nevertheless, existing slave owners were compensated and, unfortunately, slaves were required to work for an additional three years (Library of Congress, 2008).

The period of Spanish colonization (1493-1898) produced many changes on the island. The domination of the Taíno culture and the introduction of black Africans through the extensive practice of slavery changed the human geography and population of Puerto Rico. By the last quarter of the eighteenth century, 52% of the population was composed of pardos (mixed raced) and blacks, including emancipated persons and slaves (see Sued Badillo and López Cantos, 1986, p. 258). Figure 5 shows the population composition for 1802, 1812, 1820, 1827, and 1830.
The large percentage of mixed race and black population suggests the acceptance of the Spaniards to mixing with the non-white population, which widely contrasts with other European colonizers’ ideologies. Gordon (1950) provides two reasons for the mixing of the white Spaniards with the non-white indigenous Tainos and African slaves. First, there was a lack of white Spanish females on the island and second, there was a need to cheaply increase the number of slaves since the Taino population was declining. Sued Badillo and López Cantos (1986) suggest that, “in the eighteenth century there were very few
pure white families” (p. 259). This situation contributed to the evolution of a distinctive conceptualization of race which will be further explored in Chapter 4.

The Cuban and Dominican Migrations

In Puerto Rico’s recent history Cubans and Dominicans have formed the main groups migrating to the islands, and they have become the most noticeable minority groups of foreign origin in Puerto Rico within the last century (1900s). These groups arrived to the island in different migratory waves.

In 2000, there were 19,973 residents of Cuban origin in Puerto Rico (U.S. Census, 2000). Residents of Dominican origin in Puerto Rico numbered 56,146 (U.S. Census, 2000). However, their number could be higher because the inability of the census to collect data from the illegal population. Each group’s migratory patterns as well as its social dynamics is discussed below.

Cubans

Soon after the victory of the socialist revolution there was a significant migration of Cubans to Puerto Rico (Martínez-San Miguel, 2003). This migration was initiated after 1959 (Cobas and Duany, 1997) (see Figure 6 and 7). Martínez-San Miguel (2003) provides a view of the Cuban migratory patterns to Puerto Rico:
Three major migratory waves: 1) from 1959 to 1973, includes what is known as the golden exile (1959 – 1969) and the freedom flights (1965 – 1973), what greatly constitutes professionals and members of the middle and upper class that left the country after differences with the regime 2) from 1973 to 1980, in which members of the working class arrived – mainly the Mariel exodus –beginning the identification as economic migrants and not necessarily political migrants, and 3) from 1980 to 1995, which is mainly characterized by economic migrants with a lesser numeric impact in Puerto Rico - including Cubans that left the country during the crisis of August of 1994 (p. 105) (Author’s translation).

The first of these three migratory waves can be linked to Faist’s *integration* category of migration. Due to the adoption of socialism in Cuba, the professional elite making up this wave could no longer be integrated into society without losing their elite status. The last two waves of Cuban migration can be linked to Faist’s goal attainment category of migration. Here, the goal of economic advancement, difficult to attain in Cuba’s turbulent economy, is the primary motivation for migration.

The socio-economic bifurcation among Cubans as well as the recognition that the Cuban population in Puerto Rico is a relatively small is relevant to
understanding the dynamics between immigrant groups and Puerto Ricans. Cubans in Puerto Rico enjoy more social mobility than any other minority group for different reasons: 1) in comparison to Dominicans, they are a small group, which results in less friction (U.S. Census, 2000), 2) Cubans enjoy a different migration status in comparison to Dominicans. Cubans are almost automatically eligible for U.S. citizenship since they come from a socialist country (see Cuban Adjustment Act) and 3) In general, the first Cubans that arrived in Puerto Rico, mainly businessmen and entrepreneurs, enjoyed a higher socio-economic status (Martínez-San Miguel, 2003). Also, the Cuban community – mainly in Florida – receives a substantial percentage of small business loans from the U.S. government (Grosfoguel, 2003). In addition, the Cuban migration decreased in the 1970’s in contrast to the Dominican migration, which increased in the 1980’s. Another factor contributing to the social mobility of Cubans is the perception that Cubans are whiter than Dominicans. This perception revives the ideas of racial intolerance and xenophobia.
Figure 6. Cuban Migration to Puerto Rico 1959 to 1980 (After Duany, 1992)
Figure 7. Generalized Migratory pattern of Cubans and Dominicans
Dominicans

Dominican mass migration to Puerto Rico can be divided into three stages. The first stage occurred soon after the assassination of the Dominican President Rafael Trujillo (Martínez-San Miguel, 2003). Moreover, after the U.S. intervention in 1965 occurred there was an increase in the numbers of Dominicans migrating to Puerto Rico (Duny, 2005). In 1965 a civil war erupted resulting in the arrival of Dominican professionals and intellectuals to Puerto Rico (Cambeira, 1997). Many of these professionals fled the country due to their political ideology.

The second migration stage was in the 1970s and 1980s when more educated people and skilled workers reached the island in search of economic opportunities. This time period corresponds to a crisis in the Dominican Republic created by falling world prices of sugar, corruption, a plunging national economy, the devaluation of the Dominican peso, heavy borrowing from foreign banks, and damage from hurricane David in 1979.

The last migration stage, in the mid 1990s, consisted of a significant number of the working class Dominicans (many of them arriving to Puerto Rico illegally) leaving their country after the economic crisis (see Martínez-San Miguel, 2003). Due to the economic dependence on sugar, the Dominican Republic saw revenues plummet when demand for sugar fell. The Dominican Republic began to diversify its economy by expanding into tourism, agro-
industry, and manufacturing (Martínez-San Miguel, 2003). However, these efforts did not stop the Dominican peso from devaluation. Therefore, many Dominicans were forced by the economic situation to migrate to Puerto Rico.

Puerto Rican society generally associates Dominicans with illegal migration. Therefore, Dominicans have become scapegoats for many urban ills. The two most common examples includes Puerto Ricans complaining that Dominican cheap labor displaces Puerto Ricans from their jobs, and the media associating Dominicans with illegal migration, prostitution, drugs, and other criminal activity (Duany, 1990). Generally, Dominicans in Puerto Rico are from rural areas or small towns of the Dominican Republic and are young adults. Also noticeable is the high proportion of females migrating to Puerto Rico, and the tendency for migrants to have only a primary level of education (Duany, 1990).

In summary, “most Dominican workers have not displaced Puerto Rican workers, with the possible exception of some types of skilled labor, but instead have come to fill a void in the Island’s labor force, specializing in low-wage occupational niches” (Duany, 2005, p. 254). Thus, Dominicans occupied a labor segment that not many in Puerto Rico are willing to accept, such as tailors, janitors, and plumbers (Duany, 1990).

Dominicans have been marginally integrated into the Puerto Rican economy and society. However, Dominicans are not represented at the political level (Duany, 2005). Nevertheless, the Dominican community has been active at
the social level. “Immigrants from Cotuí, Jarabacoa, La Romana, La Vega, and Puerto Plata [areas in the Dominican Republic] have formed their own groups in Puerto Rico” (Duany, 2005, p. 256).

Another dilemma for the Dominican community is reflected in the confusion surrounding their racial identity. In Puerto Rico, Dominicans are considered black. The processes of racialization in the Dominican Republic result in Dominicans being considered as Indians or brown skinned but when Dominicans arrived to the island they are considered as being black by many Puerto Ricans (Duany, 2005). Thus, the construction of racial identity tends to be fluid according to place. Duany describes this flexible categorization, “ironically, the dominant discourse on Dominicans in Puerto Rico resembles that of Haitians in the Dominican Republic or, for that matter, Puerto Ricans and Dominicans in the United States” (Duany 2005, p. 260). A twofold outcome from this dynamic is the Dominican status as a foreign group and a black group. Due to this duality Dominicans are the minority group least accepted by Puerto Rican society.
Figure 8. Dominican Migration to Puerto Rico 1961 to 1986 (After Duany, 1989)
Summary

This chapter presented the Caribbean and specifically Puerto Rico as a region with a rich migratory history which resulted in interrelationships among various indigenous groups, later incorporating white conquerors, and African slaves. The current cultural context of Puerto Rico is inseparable from the influences of this past. The history of migration has resulted in a contemporary cultural identity for the island in which the historical influences are manifested both spatially and culturally. These influences are discussed in the next chapter.
Chapter 4

Spatio – Cultural Consequences of Migration

Introduction

As outlined in Chapter 3, contemporary Puerto Rico is the product of a long migratory history spanning pre-Columbian times to nearly the end of nineteenth century. Both the spatial and cultural aspects of migration patterns can be observed on the Puerto Rican landscape today. In the context of this research, the most important artifact of the migratory history of the island is the creation of a uniquely Puerto Rican concept of race and racial identity. This chapter is presented in four sections. The first section describes an important cultural consequence of migration – the unique Puerto Rican view of race and identity. The second section describes both the spatial and cultural interactions among the various racial and national groups that migrated to the island. The third section outlines how these racial views and interactions can impact the housing market. The chapter culminates with the presentation of a spatio-cultural framework through which the results and interpretations of this research can be viewed.
Cultural Consequence: Puerto Rican Concept of Race and Identity

Race and Culture

The concept of race in Puerto Rico was defined during Spanish rule by the prevalent social concept of “Régimen de Castas” or society of castes which created a social hierarchy based on a variety of indicators (income, ethnicity, land ownership) and not solely on race. “The stratified structure of the Society of Castes began to form during the first decades of colonization, and during the eighteenth century assumed, notwithstanding regional variation, a more precise definitive form” (Kinsbruner, 1996, p. 19). The caste system in Puerto Rico provides to the free blacks the chance of socio-economic upward mobility while at the same time did not protect whites from descending in their socio-economic status (Kinsbruner, 1996). The social mobility of people of color and the frequency of mixed race marriages developed a type of “racism more social than biological” (Sued Badillo and López Cantos, 1986, p. 261).

Cultural aspects are critical to understanding the human geography of this research, based on the perceptions of minority groups and housing values, because culture establishes similar or dissimilar relations among different groups (Cruz-Báez et al., 2002). It is important to clarify that ethnicity, race, and nationality share a center such as ancestry but each one might be identified according to its differences (Fenton, 2003).
In other words, the culture is transmitted through teaching or imitation from one cohort to another. This process starts at the basic unit of our social organization: the family. Fenton (2003) continues:

These ideas about culture will typically include myths about the past, belief about ‘the kind of people we are’, and the idea that ‘culture’ defines a group in that it may constituted by language, dress, and custom (p. 13).

Culture, in addition to race and ethnicity, shapes the borders of a group. Brass (1996) exposes his point of view, “an ethnic group that uses cultural symbols [to differentiate themselves from others] is a subjectively self-conscious community that establishes criteria for inclusion into and exclusion from the group” (p. 86). This delineation will play an important role in the interaction between different groups that share spatial proximity.

**National Identity**

Racial identity in Puerto Rico is different from that of the United States. Within the United States a strong dichotomy exists between black and white with little room in between for other classifications. This type of dichotomy fails in Puerto Rico where the inhabitants are the product of the mix among three races:
the pre-Columbian indigenous population, namely, Tainos, white Europeans, and black Africans.

The “one drop rule” in the United States (i.e. laws stating that any person with even a small trace of African heritage is considered black) contrasts with the Society of Castes of Puerto Rico. Therefore, it was the “Régimen de Castas” the legal document that provided the earliest juridical framework to formalize interracial marriages in which the commonalities are not based on common descent, such as race, but common cultural and linguistic characteristics that pertain to a nation: Puerto Rico. That is why the outcome is not just reflected throughout different gradients of colors – from white to brown to black – but also in a variety of indigenous, black, and Spanish vocabulary as well as various religious and cultural practices.

Thus, in Puerto Rico, much more emphasis is placed on the Puerto Rican culture, which derived from miscegenation, rather than racial characteristics. Figure 9 shows the concept of the intersection of race and culture in Puerto Rico. The mural is about the Puerto Rican culture, which is used to reinforce nationality. Figure 9 reads “Three races – one culture, Puerto Rican” (Author’s translations) showing the complexity of Puerto Rico as a nation. The mural shows a background with different scenes including the Pre-Columbia era, colonization, slavery, and abolition. In the foreground there are three faces,
Taíno, European, and African, which made up the Puerto Rican ethnic identity intersecting the races with the culture.

Since the Hispanic Caribbean is the result of miscegenation the focus of this mural targets cultural identity rather than race. However, this does not mean that the concept of race is completely absent in Puerto Rico. The special case of the Afro-Puerto Rican coastal community of Loíza is an example of the survival of the concept of race.

According to the census, there are 302,933 Afro-Puerto Ricans in the island (U.S. Census, 2000). The Afro-Puerto Rican population is spread across the entire island. However, it is important to notice a conspicuous group: the Afro-Puerto Rican coastal community of Loíza. Loíza is the only town in which the black
population is double that of the white population. This town was populated by emancipated African slaves and *cimarrones*, which was the name given to escaped slaves in Puerto Rico. This community is characterized by a strong presence of African heritage.

The perception of Afro-Puerto Ricans of Loíza as blacks and a minority group may be rooted precisely in the efforts done by this community to maintain their African heritage. These efforts have been manifested both culturally and in their reluctance to move out of Loíza. Even when Afro-Puerto Ricans are in general terms mixed race people like other islanders, their degree of mixture is less than other Puerto Ricans. Therefore, the Afro-Puerto Rican coastal community displays certain particular characteristics that are not found throughout the general population of Puerto Rico. There are a variety of works pointing out the cultural contributions of the Afro-Puerto Rican coastal community (Duany, 2002).

All this suggests that the concept of race in Puerto Rico is flexible, dilute and changing in comparison to the extreme dichotomy of racialization that dominates in the United States of America.

*Puerto Rican Concept of Racialization*

Racialization is the construction of unequal social hierarchies characterized by dominant and subordinate social relations between groups that
are based on color skin. For instance, in the United States there exists evidence in the historical records that there was an established ranking of race desirability for housing value evaluation purposes in which English and German were the most favorable races while Mexican and African-American were the least favorable (Abrams, 1955, p. 161).

In Puerto Rico, the notion of whiteness stretches beyond that of the United States. In other words, there is space in Puerto Rico for people with black ancestry to be categorized as “white” unlike in the United States in which those who are of mixed race are defined as black. One example of this is seen in the neighborhood of Gandul where a group residents recognized several intermediate categories (Duany, 2002). Nevertheless, this doesn’t eliminate a hierarchy based on skin color.

Historically in the United States, the “one drop rule” defined any person with a single drop of African blood as black. Therefore, this minimum factor of “one drop” will automatically isolate minority groups from the rest of the community – the majority group – at the social, economic or cultural level. Figure 10 shows the contrast between the Puerto Rican and the American views of race.
As a result of the “Régimen de Castas,” discussed earlier in this chapter, race may not be as problematic as national identity. This is not to say that Puerto Rican culture is without racial conflict. As noted in the previous section, the residents of the Afro-Puerto Rican coastal community of Loíza consider themselves and are recognized by Puerto Ricans as Black. The Puerto Rican racialization is more flexible and dilute as shown in Figure 10 in which white is considered “good” and black is considered “bad”.

The diminished importance, in comparison to other western countries, of racialization in Puerto Rico and the heightened importance of nationality creates a unique cultural context where the interactions among various racial, ethnic and national groups are more dynamic, and therefore may strongly influence the housing market. The patterns of these spatial and cultural interactions are discussed in the next section. Puerto Rico uses very fluid and complex racial categorizations, which are reflected in the activities of daily life. This racial
categorization shows a more defined racial hierarchy. Nevertheless, in Puerto Rico racial classifications are more flexible (Landale and Oropesa, 2002). Duany (2002) presents the major vernacular racial terms used in Puerto Rico, which are shown on Table 1.

Table 1. Major Vernacular Racial Terms used in Puerto Rico  (Duany, 2002)

<table>
<thead>
<tr>
<th>Term</th>
<th>Approximate Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blanco/a</td>
<td>White</td>
</tr>
<tr>
<td>Blanquito/a</td>
<td>Figuratively, elitist, upper class</td>
</tr>
<tr>
<td>Coloro</td>
<td>Redheaded, reddish skin</td>
</tr>
<tr>
<td>Rubio/a</td>
<td>Blond</td>
</tr>
<tr>
<td>Cano/a</td>
<td>Blond with ‘fair’ skin</td>
</tr>
<tr>
<td>Jincho/a</td>
<td>Pale skinned; sometimes used pejoratively</td>
</tr>
<tr>
<td>Blanco/a con raja</td>
<td>White with some visible black features</td>
</tr>
<tr>
<td>Jabao</td>
<td>‘Fair’ skinned with curly hair</td>
</tr>
<tr>
<td>Trigueño/a</td>
<td>Usually light mulatto</td>
</tr>
<tr>
<td>Moreno/a</td>
<td>Dark skinned; usually dark mulatto</td>
</tr>
<tr>
<td>Mulato/a</td>
<td>Mixed race; rarely used</td>
</tr>
<tr>
<td>Indio/a</td>
<td>Brown skinned with straight hair</td>
</tr>
<tr>
<td>Café con leche</td>
<td>Tan or light brown skinned</td>
</tr>
<tr>
<td>Piel Canela</td>
<td>Tan or light brown skinned</td>
</tr>
<tr>
<td>Prieto/a</td>
<td>Dark skinned; usually derogatory</td>
</tr>
<tr>
<td>Grifo/a</td>
<td>Dark skinned with kinky hair; usually derogatory</td>
</tr>
<tr>
<td>De color</td>
<td>Euphemism for black</td>
</tr>
<tr>
<td>Negro/a</td>
<td>Black; rarely used as a direct term of reference</td>
</tr>
<tr>
<td>Negrito/a</td>
<td>Often used as a term of endearment</td>
</tr>
</tbody>
</table>

This range of color implies a hierarchy between European-like (desirable) and African-like (undesirable) (Alleyne, 2002). In other words, as Rodríguez-Morazzani argues, “blackness is a problem” (1998). Even further, these major vernacular racial terms (Table 1) present a racial hierarchy that might be applied to any person in Puerto Rico regardless of nationality such as Dominican or
Cuban. Unfortunately, very little research has been done in regards to the racialization of Dominicans in Puerto Rico (Sawyer and Paschel, 2007). The multiple categorizations that refer different gradients of dark color skin (e.g. café con leche, piel canela, trigueño) uncover the complexity of the interaction between race, nation, and identity (Sawyer and Paschel, 2007).

In Puerto Rico, Dominicans are seen as being black (Duany, 2006), which consequently dispels the myth of a “rainbow people” or a color blind society. In addition to skin color, the status of being immigrants with another nationality, especially for Dominicans, might track them into a lower level on the racial hierarchy of Puerto Rico. Simultaneously, there are other factors beyond race and nationality, such as income, that might affect the place that a person occupies in a racial hierarchy (see McCormick and Ayala, 2007; Cable and Mix, 2003). Nevertheless, the dichotomy between black and white still exists in Puerto Rico (Alleyne, 2002).

The national ideology or hegemonic discourse of race in Puerto Rico in which Puerto Ricans are color-blind is continuously represented. For example, the Puerto Rican media tends to support the idea of a colorless nation. Rivero (2002) analyzed the racial discourse in Puerto Rico using as example a local production *Mi Familia*. *Mi Familia* is a situation comedy about a black Puerto Rican family. However, the topic of race is never mentioned. In fact, a production personnel indicated to Rivero that there is no color involved in the
situation comedy and the show is just about a Puerto Rican family. Rivero argues that the producers’ erasure of blackness is a way to reinforce the hegemonic discourse that racial prejudice is non-existent on the island.

This hegemonic discourse has made Puerto Ricans live race in silence (Velázquez Vargas, 2008). Velázquez Vargas presents a personal narrative to approach the issue of race relations in Puerto Rico. She narrates her experience about race in third grade when for first time faced the racial question through a classmate that called her negra carbón (literally, black charcoal). Even worse was how society, in this case the school, solved the problem: the school decided to remove her from the classroom. Velázquez Vargas through this example uncovers the racial problem in Puerto Rico.

The racial debate in Puerto Rico is still ongoing. Puerto Rico has been seen as a color blind society. However, this might not be the case taking into consideration the obsession with whitening (Ródriguez-Morazzani, 1998), the complex expressions of racialization in Puerto Rico (Duany, 2002) and the continuous prejudice against blacks (Sawyer and Pachel, 2007). In fact, Roth is very categorical when he points out, “[c]olor discrimination exists and shapes the opportunities and daily lives of Dominicans and Puerto Ricans in both their home countries and in the U.S.” (2008: 207).

In fact, the issue of race and nationality in Puerto Rico is complex because it intersects with the racial dynamics of two imperial powers: Spain (before 1898)
and the U.S. (from 1898 until present) (West-Duran, 2005). Moreover, the
miscegenation in Puerto Rico was viewed as a whitening process while the same
action in the U.S. will be seen as a darkening (West-Durán, 2005). Therefore,
there is resistance by the Puerto Ricans to the imposition of U.S. racial categories
(West-Durán, 2005). However, this is by no means a signal that Puerto Rico is
free of racism or prejudice. In fact, racial dynamics are a complex subject which
simultaneously uncovers racial problems.

Many scholars (Duany, 2006 and 2002; Alleyne, 2002; Sawyer and Paschel,
2007; McCormick and Ayala, 2007; Cable and Mix, 2003) have discussed the
racial dynamics of Puerto Rico. Nevertheless, in spite of the existence of a racial
categorization (white, black, mulatto, jabao, trigueño, indio, etc.), Puerto Ricans
tend to identify themselves as Puerto Ricans, or by national origin, when they
make reference to an international scale or to distinguish themselves from
another nationalities. However, by no means this is equal to suggesting that
Puerto Ricans are not aware of the racial dynamics. In fact, they are aware of
racial dynamics, even more when dealing in a smaller scale which specifically
makes reference to Puerto Rico and Puerto Ricans.
Spatial and Cultural Interactions among Ethnic and National Groups

Dominant Group

The dominant group on the island is an ethnic and genetic mixture of indigenous persons (today extinct), Europeans and Africans. As a result of this racial mix, Puerto Ricans can be any gradient of skin color from black, brown, to white. McFerson (1997) points out, “by and large, the Spanish racial tradition was flexible, particularly until the nineteenth century” (p. 120). The Spanish racial tradition was overshadowed after the Hispanic-American War when the U.S. occupied the island.

After the U.S. invasion of Puerto Rico in 1898 the racial dynamics changed due to the imposition of an American racialization which differed from the concept of racialization in Puerto Rico (McFerson, 1997). This unbending racial definition impacts the Puerto Rican society in various ways. Foremost, it is very interesting to note the continuing whitening of the Puerto Rican population, or at least how whitening is reflected in the census. For instance, in the first American census of 1899, whites in Puerto Rico reached a percentage of 61.8; in 1950, the percentage of whites in Puerto Rico was 79.7; and in 2000, whites were an 80.5 of the island’s population.

However, as shown in Figure 9, the culture derived from the three races is a stronger concept that identifies Puerto Ricans as an ethnic group. Indeed, cultural identification became more important than racial identification
(McFerson, 1997). Puerto Rican identity is the result of this mix among races. Like in skin color, Puerto Ricans are found in the entire spectrum of educational and economic levels, from uneducated to well educated and from poor to wealthy. Puerto Ricans can be found in all the economic sectors although some jobs are seen as less desirable, such as agriculture, construction, maintenance, and housekeeping. Nevertheless, according to the 2000 U.S. Census nearly half of Puerto Rico’s population, 48.2%, is below the poverty level (U.S. Census, 2000). In fact, the Commonwealth of Puerto Rico is the poorest area in comparison to other states in the American nation.

Primary Minority Group: Dominicans

Although the definition of the dominant ethnic group in Puerto Rico is broad and is based more on a sense of culture rather than skin color, this should not imply that Puerto Rico is the ideal embodiment of the cultural “melting pot.” The island hosts a large minority group of migrants from the Dominican Republic and problems based on national identity can be more conspicuous and spatially reflected than those based on race. There is evidence of friction among national groups within Puerto Rican society and these frictions are often manifested through acts such as ethnic jokes and spatially reflected in the form of graffiti. One example is shown in Figure 11, which advocates the extermination
or death to Dominicans. Later this statement was modified by a socialist organization changing the meaning to death to racism.

Figure 11. Graffiti against the Dominicans community (Martínez-San Miguel, 2003)

Yolanda Martínez-San Miguel (2003) provides details about this graffiti:

The original text uncovers a predominant idea in which numerous sectors [of the Puerto Rican society] reject the presence of the Dominican immigrant in the island...the ‘inexpressible’ that this graffiti uncovers is the public diffusion of a series of attitudes that enjoy a relatively legal, social, and cultural legitimization (p. 165) (Author’s translation).

This modification presents the opposite idea. The word “Dominicans” has been overwritten with the word “Racism” so that the graffiti reads “Death to Racism.” The graffiti after being modified spread the idea of ending the problem of racism (Martínez-San Miguel, 2003).
It is true that racial friction exists in Puerto Rico. However, racial friction in Puerto Rico is not as strong as in the United States. Indeed, representing race in Puerto Rico has been a major problem for Americans (Duany, 2002). Problems based on nationality are more prevalent. Therefore, nationality is an important concept that distinguishes those who are Puerto Ricans from others.

In other words, it is possible to point out two types of discrimination in Puerto Rico. One type is based on race in which the Black race is at the end of the color scheme and the second type is based on nationality in which the Dominican nationality, in Puerto Rico, tends to be considered unworthy in both cultural and economic terms (Martínez-San Miguel, 2003). In addition, in Puerto Rico, Dominicans immigrants perform jobs that are rejected by local workers due to be low wage or sub-standard conditions on the work site.

Spatial Consequence: Patterns of Minority Segregation for Dominican and Afro-Puerto Ricans

Segregation very often occurs due to national origin, race or ethnicity, socio-economic status, or religion preferences. “Sometimes segregation is the principle expression of group attitudes; other times it is bound in with so many other factors that it reflects little about ethnic groups” (Kaplan and Halloway, 1998, p. 3). Generally, the outcome is social distance, which is often reflected in spatial distance.
Segregation can be noticeable in various geographical areas within the metropolitan area of San Juan. For instance, two examples of social distance are the Afro-Puerto Rican coastal community of Loíza and the predominantly Dominican neighborhoods of Santurce, San Juan. Evidence of this is the high percentage of Afro-Puerto Ricans and Dominican population. The Dominican population in Puerto Rico has been increasing. This increasing presence of Dominicans is sometimes a source of friction between Dominicans and Puerto Ricans.

Puerto Rico hosts various minority groups. Yet, the interaction among them is different from group to group. The interaction between Cubans and Puerto Ricans is different from that of Dominicans and Puerto Ricans. In the same way, the interaction between Afro-Puerto Ricans and Puerto Ricans is different from that of Cubans or Dominicans. There are various scenarios, which might involve the processes of segregation, that can be associated with the various minority groups.

The first scenario is assimilation in which the level of segregation is practically null (Boal, 1999). In this scenario the urban fabric contains few or no contrasting ethnic neighborhoods. It is possible to argue that there has been an assimilation of the Cuban and Mexican population because of the relatively small numbers of these peoples. This makes their absorption into the Puerto Rican society easier. The second scenario is pluralism which is presented as a moderate-
low segregated community in an urban context which retains some ethnic characteristics and social integration. The third scenario is *segmentation* that demonstrates a moderate-high level segregation producing a pattern of segregated residential areas such that “the city will be seen by many as comprised of a mosaic of more or less ethnically exclusive neighborhoods” (Boal, 1999, p. 593). Most clearly defined is the Afro-Puerto Rican coastal community of Loíza that is recognized as a segmented area. A segmented area is clearly defined by borders and easily identifiable as belonging to the other (Boal, 1999). In fact, this is the case of this coastal community which lives in a clearly identifiable area. The fourth scenario is *polarization* which is characterized by a very high or complete segregation. The city can be easily divided in areas that contrast with each other.

Arguably, in Puerto Rico, the Dominican population can be seen as experiencing both the *pluralist* and the *segmented* scenario. Boal (1999) argues that “segregation levels will be quite high and where inter-ethnic conflict becomes violent, physical hardening of neighborhood boundaries and even individual buildings is deemed necessary as part of search security” (p. 593). Generally, this is the panorama that can be observed in various neighborhoods where Dominicans have become a high percentage of the population.
Consequences of Segregation

Segregation may impact the opportunities for educational or professional success leading to marginalization or social exclusion. Marginalization might be through social, economic, political, or other means (De Haan and Maxwell, 1998; Grant et al., 2000). Without these involvements in society the segregated groups have limited opportunity for success, which forces the minority groups to live in enclaves and results in social, economic, cultural, and political consequences. In any case, this exclusion adds nothing to the development of a region.

Segregation can arise involuntarily or voluntarily. Involuntary segregation is a direct product of discrimination in which the majority group isolates or restricts access to activities in detriment of determined minority group (Marcuse, 1997). Very often minority groups are segregated against their will; they are not included in the mainstream society, which provokes a de facto economic, social, and political dispossession (Kaplan and Holloway, 1998). On the other hand, segregation can occur voluntarily which is characterized by interrelated social networks (Peach, 1996).

Social Consequences

One outcome of segregation is the exclusionary designation of being the other. This is translated in a very likely rejection or lack of – social, economic, cultural, or political – interaction affecting the minority groups. Kaplan and
Holloway (1998) add, “if the desires of social distance is great, then the dominant group will do everything in its power to maintain the gulf between itself and the disparaged group” (p. 6). A negative attitude toward immigrants may be reflected in the social interaction of daily life. Attitudes and perceptions related to the characteristics of migrants influences where and how minorities are segregated (Kaplan and Holloway, 1998). This effect on location, persistency and the nature of ethnic segregation is a social consequence from a limited social interaction. Social consequences could be spatially reflected through housing patterns. The outcomes of social consequences engrave the social geography that reflects patterns of public space use, such as parks, schools, and shopping areas.

One factor contributing to these exclusions is the lack of accessibility. In fact, increasing access to minority groups must be a priority to reduce segregation (de Souza Briggs, 2005). This will have a multiplier effect on the social, economic, cultural, and political life of minority groups which not enjoy this accessibility.

Nonetheless, Dominicans have organized institutions as a system of support within the Dominican community (Duany, 2005). These institutions also provide connectivity to the majority group of the population. In addition, there are many other Dominican social organizations in Puerto Rico. A few examples include hometown associations and religious groups (see Duany, 2005).


Economic Consequences

There is no equal opportunity in society without equal opportunity to join the economic system. Economic segregation is one of the most serious problems for minority groups. Minority groups cannot be part of the society if they are being segregated economically. One of the social consequences, the lack of quality education, is related to individual income. In general, depressed areas lack quality schools and have decreased opportunities for good employment.

On the one hand, many of the economically marginal people perform low paid jobs and experience poor working conditions and job instability (Duany, 1990). Particularly, the Dominican population is “the more recent, less powerful, and less benefited from the urbanization process” (Duany, 1990, p. 95). Immigrants tend to occupy jobs that the majority is not willing to occupy (Duany, 1990). One example is that approximately one third of the Dominicans work in the informal sector of the economy, such as temporary construction workers or street vendors. As a consequence, minority groups are forced to live in substandard conditions. Generally there are three situations for Dominican residency: 1) they share kitchens and bathrooms with others, 2) their apartments are attached to single family dwellings that are not visible from the street, and 3) they are the renter or owner of single family dwelling.

On the other hand, the boundaries established by the Dominican community permit the introduction of an ethnic economy. There is a
considerable number of businesses, such as grocery stores, bars, and money
transfer stations, that appeal to this specific market. However, Dominicans are
not the exclusive patrons of these shops - many Puerto Ricans also support them.
In addition, it is estimated that one third of Dominicans are employed by another
Dominican (Duany, 1990).

Cultural Consequences

Many ethnic communities use culture as a way to define borders. “The
ethnic boundary canalizes social life – it entails a frequently quite complex
organization of behavior and social relations” (Barth, 1996:79). At the same time
this boundary obviously establishes a division between one group and another.
This division, sometimes clearly physically defined, is established because the
rejection experienced from the majority group. Therefore, both groups
emphasize the importance to accentuate their respective national identity. This
identity will be shaped according to the context of that specific community
(Kaplan and Halloway, 2001 and Boal, 1976).

A concrete example is the Puerto Rican community in Chicago, which is
physically delineated with two gates with the shape of a Puerto Rican flag
(Figure 12), and the Puerto Rican community in the West Side of Cleveland,
Ohio. In (West Side) Cleveland, the Puerto Rican flag is alone on the property of
Moisés Cintrón (2004) because the rejection of the majority group toward this
member of the Puerto Rican community. As he suggested to me, the social rejection was catalytic to define a border, in this case, denoting *Puertorriqueñidad*.

![Puerto Rican Neighborhood in Chicago](image)

**Figure 12. Gate at the Puerto Rican Neighborhood in Chicago**

Sometimes, cultural outcomes are lightly accepted by the majority group such as dance, music, or ethnic restaurants. In general, these do not jeopardize the beliefs of the mainstream community. Also, the fetishization or eroticization of alternative culture (i.e. taking another culture as a commodity) provides a degree of security and indifferently downplays the influence of minority groups.

In a same way, the trivialization performed by the popular media and the use of cultural practices for commercial purposes could reduce the significance of events, as seen in the celebration of *cinco de mayo* in the U.S. What is contested here is a dominant set of values or way of life over a minority set of values. The
outcome is reflected in the practices of the majority taking a leading and
dominant position in society (Knox and Pinch, 2006).

Political Consequences

One of the problems that affect minorities, besides economic isolation, is
the scarcity of political power to provide a change of well being to the
community. For example, Puerto Rico’s Electoral Commission does not release
voting patterns and therefore election results have not been appropriately
documented (Duany, 2005). Generally, immigrants are not part of the
mainstream resulting from a lack of economic and political power (Cohen in
Hutchinson and Smith, 1996). Precisely, this is the key to maintaining an
underclass group.

However, the inability of minority groups to produce change on the
political level has been influenced by majority groups. Apartheid in South Africa
was a legal framework established by a white minority to subject a non-white
majority. In the U.S. for example, the very well known action of gerrymandering
was a way to suppress minorities in the United States. Gerrymandering is the
rearrangement of the congressional boundaries in order to influence the outcome
of elections. This rearrangement could affect the political power of a minority
group in the United States, reducing their chances to gain equal access of
opportunity. After all, “ethnicity is essentially a political phenomenon” (Cohen,
in Hutchinson and Smith, 1996, p. 84). The continuous battles for minority
groups to create a space for themselves becomes a class consciousness that could
be reflected in a political outcome. Nevertheless, in Puerto Rico there is an
increasing interest in local politics by Dominicans although many Dominicans
are not U.S. citizens, making them unable to participate in local elections (Duany,
2005).

Interaction between Minority Status and the Housing Market

One example related to minority groups and housing occurs when
minorities are methodically steered away from housing options (Massey and
Denton, 1993). Such processes of residential segregation, and other types of
marginalization or social exclusion, should be a reason for concern to social
scientists because housing represents a major investment and substantial wealth
for a family (Massey and Denton, 1993). Yet, the chances of success can be
diluted when there is an unequal exchange of housing value, obligating the
marginalized to remain attached to the same socio-economic condition and to the
same structure, which makes them vulnerable to higher socio-economic classes.
Thus, segregation and poverty contribute to social immobility.

Residential segregation has been a key element of racial and ethnic
relations in the U.S. (See Massey and Denton, 1993). Consequently, residential
isolation and the low housing value are one of the biggest consequences for the
underclass population. These situations affect most minority groups. Very often the housing unit is used as the only means to accumulate wealth and economic investment (Massey and Denton, 1993). Unfortunately, in this process minority groups are disadvantaged because housing units in their neighborhoods do not appreciate as fast as in other neighborhoods. Thus, decreasing economic opportunities make it difficult to break this cycle of exclusion.

The chances for social and economic improvement for most of the marginalized groups in Puerto Rico (Dominicans and Afro-Puerto Ricans) would increase if the housing value exchange were more equal. The opposite is also true; if the housing value exchange were more unequal then the chances of success will decrease. Simply put, nationality or race can be a factor that impacts housing value. Therefore, I intend to explore the impact of minority groups on housing value.

Conceptual Framework for Race, National Identity, and Housing in Puerto Rico

Sometimes problems occur when different ethnic groups have to share a common space. This interaction could lead to exclusion of minority groups from jobs, recreation, education, housing and others, as shown in Figure 13. Thus, segregation, especially in housing, is manifested through space. However, segregation is not a universal phenomenon that occurs uniformly in the United States and Puerto Rico, and neither is it uniform for all minority groups.
The Cuban community in Puerto Rico is very small in comparison to other groups and somewhat spread throughout the rest of the population. However, there are various areas in which the Cuban population reaches between 5 to 10 percent, and in one exclusive area, Isla Verde, the Cuban population is over 11 percent (U.S. Census, 2000). Nevertheless, these areas are not considered Cuban neighborhoods. Thus, there is no identifiable Cuban neighborhood in Puerto Rico as is the case for Dominicans.

The Cuban population has been differentiated from other minority or immigrant groups. First at all, the Cubans migrants are integrated into the mainstream society. For instance, Cubans in Puerto Rico enjoy high income and educational attainment, and tend to have their own social networks (Cobas and Duany, 1997). Moreover, the Cuban exiles are clearly a special group to the U.S. government. The Cuban Refugee Program not only supports the exiles’ efforts to achieve economic independence but also promotes their sense of identity as an immigrant group (see Cobas and Duany, 1997 and Grosfoguel, 2003).
Figure 13. Conceptual Framework of the Problem
Examining Cubans in Puerto Rico shows that there is an over representation of the Cuban upper class (Cobas and Duany, 1997). Cubans on the island are lighter-skinned, wealthier, and better educated in contrast to the poor, dark-skinned and less educated Cubans who benefited from the social revolution. The Cuban community in Puerto Rico enjoys mobility and connectivity, and has not suffered from physical violence as have other groups.

In contrast to the Cubans, the Afro-Puerto Rican coastal community of Loíza and Dominicans are more visible in the population. There are various identifiable areas that can be recognized as Dominican neighborhoods in the same way that the Afro-Puerto Rican coastal Community of Loíza can be recognized. In general, the areas that are recognized as Dominican neighborhoods contain a Dominican population of at least 10 percent.

Both groups, Dominican and Afro-Puerto Rican, are considered as dark-skinned in contrast to Cubans. Also, both minority groups had been subjected to physical violence. In fact, they have been victim of police brutality. Furthermore, the violence against Dominicans takes different forms, from graffiti to ethnic jokes (Martínez-San Miguel, 2003).

However, it is important to note the existence of the Dominican ethnic economy as well as cultural and social networks. Furthermore, similar to Puerto Ricans in New York, Dominicans in Puerto Rico celebrate the Dominican Parade in the city of San Juan. Consequently, the Dominican community in Puerto Rico
is constantly pressured by graffiti, ethnic jokes and violence. On the other hand, they actively participate in social and cultural events and have established an ethnic economy that defines some of their communities.

Conceptually, the linkage between housing and segregation is manifested in two different ways: 1) disjointed clusters and 2) transitional clusters. The Afro-Puerto Rican coastal community can be identified as a pattern of residential segregation of a disjointed cluster, while the Dominican community in Puerto Rico presents a pattern of residential segregation of transitional clusters in various neighborhoods of the San Juan Metropolitan Area.

This work explores the manifestation of the disjointed clusters pattern of segregation, which is representative of the Dominican community. However, both manifestations, which are spatially manifested through housing, are shown in Figure 13. Pivotal to this conceptualization is that of segregation and its spatial manifestations.

Summary

This chapter presented the Caribbean as a region of constant migration. Therefore, the evolution of the ethnic landscape of Puerto Rico including the native, white, and black heritage has evolved into a complex mosaic of social relations that has relaxed racial categories in the island. The cultural identity of Puerto Ricans is blended with these different races stretching the notion of
whiteness beyond that of the United States. Consequently, cultural identity tends to carry a more important meaning than race. Nevertheless, the differences in residential patterns are based on the concept of national identity combined with the broadened racial categorizations.
Chapter 5

Method of Analysis

Introduction

This research uses quantitative and qualitative methods in order to analyze housing value as well as attitudes and perceptions related to it. Univariate and multivariate techniques are used to examine the spatial distributions of different minority and nationality groups across the study area, as well as and the spatial patterns of housing values. The primary univariate statistic used is a measure of spatial association, $G_i^*$, and its purpose is to identify spatial clusters of minority/nationality groups. The multivariate technique used is a method of quantifying spatial relationships, geographically weighted regression (GWR), and its purpose is to explore the relationships between ethnicity/nationality and housing value. The quantitative analysis uses data from the U.S. Census. The qualitative method used was survey analysis. A survey was conducted that gathered original empirical data to frame the social context for the study as well as capture attitudes and perceptions toward ethnic and national groups.
Prior to presenting the actual methods of analysis used in this research, a brief review of methods used in other housing studies is presented. Next, the research questions are exposed and finally the methods of analysis used are discussed in detail.

Assessing Urban Patterns

Housing value related issues have been analyzed through numerous techniques and empirical studies. For example, one of the most common techniques used to assess housing value issues is ordinary least squares regression (OLS), which is a model that examines the association between variables. There are other statistical techniques that have been used to evaluate data in urban analyses, such as the segregation index, chi-square analysis and different clustering methods. The following sections review some of these techniques.

Segregation Indexes

There is a large body of research on segregation indexes (e.g. Massey and Denton, 1993; Morrill, 1991; Kaplan and Holloway, 1998; Wong, 1998, 2005). Segregation indexes help to identify patterns that may lead to inequalities in areas such as housing or education. Kaplan and Holloway (1998) review some basic measures of non-spatial segregation such as eveness. The measure of
eveness is commonly referred as Index of Segregation and “represents the percentage of the minority population that would have to move in order to achieve an even distribution” (Kaplan and Holloway, 1998, p. 11). Other indexes are also discussed. Exposure, for example, measures the probabilities of “encountering a person of another group within one’s residential subarea” (Kaplan and Holloway, 1998, p. 15). However, these indexes of segregation are less useful in geographic research since they do not take spatial attributes and relationships into account.

Unlike aspatial indexes, Wong developed a method in which it is possible to explore segregation at both the local and global levels assuming the potential interaction across boundaries. This segregation measure (GD) is based on the interaction of people from different areas (defined using geographical boundaries such as tracts). Therefore this segregation measure is more useful to geographers and any other social scientists because of its spatial nature. However, there are other techniques that have been used by researchers to characterize population patterns.

_Clustering Methods_

Clustering methods are designed to support the examination and review of spatial information. The examination and review of spatial information is known as exploratory spatial data analysis (ESDA). There is an extensive body
of literature about ESDA methods (e.g. Chi and Zhu, 2008; Brown and Chung, 2006; Fotheringham et al., 2002; Anselin, 1995; and Haining, 1990). ESDA summarizes and displays data, identifies exceptions or “hot spots” and detects general trends without formal statistical inference, and very often precede a regression analysis (see Chi and Zhu, 2008 and Fotheringham, 2002). Anselin (1995) argues that,

The important role of location for spatial data, both in terms of absolute location as well as in terms of relative location, has major implications for the way in which statistical analysis may be carried out. In fact, location leads to two different types of so-called spatial effects: spatial dependence and spatial heterogeneity. The former results directly from the First Law of Geography. This law will tend to results in observations that are spatially clustered, or in other words, will yield samples of geographical data that will not be independent. From a geographical perspective, this spatial dependence is the rule rather than the exception, and it conflicts with the usual assumption of independent observation in statistics (p. 112).
Due to the importance of ESDA, Haining (1990) suggests a two-step statistical framework for spatial data analysis: exploratory and confirmatory. The importance of ESDA is inherent when “spatial structure in a measured attributes arises most often from measurement error, continuity effects including spatial heterogeneity, or from the operation of some form of space-dependent process or mechanism” (Haining, 1990, p. 21). In fact, Anselin (1995) points out, “an important component of ESDA is to measure the spatial association between observations for one or several variables” (p. 111) because the manageability in both spatial statistics and GIS. Fotheringham et al. (2002) go farther, suggesting that local statistics and other exploratory tools are “not as clear-cut as it might seem because local statistics (exploratory methods) can also play an important role in confirmatory analyses as well as in building more accurate global models” (p. 7).

Brown and Chung (2006) use clustering methods to identify ethnic patterns in Franklin County, Ohio. They calculate Location Quotients and the Moran’s I index as a measure of clustering /segregation. In addition, they advise, “while local indices based on secondary data expose the terrain of clustering/segregation, follow-up fieldwork and/or secondary data analysis in a mixed methods framework provides a better understanding of the ground-level reality of clustering/segregation” (Brown and Chung, 2006, p. 125).
They also used these techniques to identify the clustering-exposure dimension. Brown and Chung (2006) explain:

The Location Quotient has the advantage of simplicity, straightforwardness, and familiarity; Local Moran’s $I$ is better grounded statistically. But there is also a distinct difference in what each measure portrays. $LQ$ treats each areal unit independently, thus indicating single-unit concentration, whereas Local Moran’s $I$ gauges a unit in terms of the characteristics of its neighbours [sic], thus indicating a cluster of areal units. Hence, Local Moran’s $I$ is more precise and conservative in identifying a racial/ethnic cluster and portrays the clustering-exposure dimension of segregation. (p. 129).

Brown and Chung (2006) point out an advantage “the Location Quotient better illuminates the entire fabric of racial/ethnic locations, or concentrations, including outliers that indicate spatial trends” (p. 140). Unlike the Location Quotient, Moran’s Index $I$ “gauges a unit in terms of its neighbours’ characteristics, thus indicating clusters of areal unit concentrations” (Brown and Chung, 2006, p. 131). The Moran’s Index $I$ takes “the values of the target feature
and the neighboring features are both compared to the mean” (Mitchell, 2005, p. 167).

*Regression Models in Segregation Analyses*

“Regression analysis is primarily concerned with estimating and/or predicting the (population) mean value of the dependent variable $Y$ on the basis of the known (or fixed) values of one (or more) explanatory variable(s) $X_i$” (Dillon and Goldstein, 1984, p. 209). There is an extensive series of studies on housing based on regression analysis (e.g. MacPherson and Sirmans, 2001; Harris, 1999; Kiel and Zabel, 1996; Follain and Malpezzi, 1981; Daniels, 1975; King and Mieszkowski, 1973).

MacPherson and Sirmans (2001) examined changes in home prices relative to the racial composition of the location. Their study used data on repeat home-sales from the Florida Department of Revenue to create an index for two counties in Florida. In addition they combine data from the U.S. Census. They use as variables housing characteristics as well as neighborhood characteristics. They found that change in racial/ethnic composition affects housing prices more than racial/ethnic composition of the neighborhood.

Harris (1999) used the housing unit as the unit of analysis but integrated the racial composition of the neighborhood. Data for this study were from the
Panel of Study of Income Dynamics. He suggests that property values do respond to racial composition.

King and Mieszkowski (1973) used regression analysis to explore differences in the amount paid for similar units among blacks and whites to estimate racial discrimination in the New Haven, Connecticut housing market using data gathered from a special survey of rental units. The variables correspond to different factors of neighborhood effects, such as accessibility, social - economic – demographic context, and public services provision.

The study of Follain and Malpezzi (1981) used regression models to explore differences in payment for housing units between blacks and whites. This study covers 39 large Standard Metropolitan Statistical Areas (SMSA). Their study suggests that, “whites pay a premium for housing in predominantly white neighborhoods” (p. 203).

Daniels (1975) investigates the influence of racial segregation on housing prices in Oakland, California. His study was done using U.S. Census of Population and Housing data for 1960 at the census tracts level as well as land use data from an unpublished survey conducted by the Bay Area Commission in 1965. The study, which used regression, suggests, “a unit of space was more expensive in the black as compared with the white submarket” (Daniels, 1975, p. 120).
Spatial Analysis in Housing Markets

A comprehensive methodology is presented by Can (1998). Can (1998) proposes a spatial conceptual framework that includes an exploratory spatial data analysis (ESDA) and a confirmatory data analysis (CDA) and modeling. The ESDA “involves a careful investigation of spatial structure in geographic data sets in addition to their standard distributional properties” (Can, 1998, p. 70). In addition Can (1998) presents a Confirmatory Data Analysis where “CDA methods explore systematically the structural relationship among geographic distribution of selected attributes” (p. 72).

The exploratory spatial data analysis refers to the identification of spatial patterns. “Spatial association statistics can be used either to measure spatial clustering in the whole system or to determine whether a given observation value significantly differs from its neighbors in space” (Can, 1998, p. 70). In addition to the exploratory spatial data analysis a confirmatory data analysis is used to examine the relationship between geographic distribution and neighborhood attributes. Can (1998) adds “CDA is similar to the traditional econometric framework in terms of emphasis on hypothesis testing, estimation and prediction, but also provides tools for the formal incorporation of spatial structure into functional relationships” (p. 72).

Can (1998) discusses the importance of location in housing markets through “four major differentiating factors across neighborhoods [which] may
lead to positive or negative externalities on residents: accessibility; physical environment; social, economic, and demographic context; and public-service provision” (p. 63).

Accessibility is a sensitive and important geographic factor. The location of the housing unit determines accessibility to health care, education, job opportunity, shopping, and others. The physical environment is a factor that impacts the housing value. The building period (e.g. age of construction), the type (e.g. single-family, multi-family dwelling) of construction, the availability (e.g. vacant), and the status of a house such as renter or owner-occupied are factors that affect the physical environment of a house and produce and impact on the housing value. The physical environment factor can be heavily influenced by flood zones, landslides, local conditions, and other irregularities that can affect the neighborhood and, consequently, the housing value. Can (1998) explains, “accessibility and the physical patterns of neighborhood landscape, housing production, and redevelopment are the starting points of social and economic variation across neighborhoods within urban areas” (p. 64).

The social, economic, and demographic factors influence the community as well as the property value. Communities suffering some kind of isolation (e.g. government abandonment) can be in disadvantaged compared to others. For instance, an area segregated in terms of race or income can reduce the chances of success of the community’s future generations. Thus, a fragmented community
will be less prepared to face problems and improve the quality of life of the area.

In addition, She comments “public school quality and crime protection have been the most important [public] service [provision] that households consider because of both short- and long-term economic and social consequences” (Can, 1998, p. 65). These factors have the power to affect, positively or negatively, the chances of economic improvement (e.g. social and economic) of an individual.

Research Questions

This section addresses the methods to be used in each of the research questions. The following questions will guide this study:

1. Are the patterns of median housing values for Cubans, Dominicans, Afro-Puerto Ricans, and Puerto Ricans different?

2. Are the spatial patterns of Cuban, Dominicans, and Afro-Puerto Ricans clustered in higher or lower values than you might expect to find by random chance?

3. What neighborhood characteristics globally impact housing values within the study area?

4. What neighborhood characteristics locally impact housing values within the study area?

5. Are the findings from the global and local regression similar to the perceptions of the residents gleaned from the survey responses?
Research Approach

The research approach employed in this dissertation is based in two main components: 1) a modified view of Can’s theoretical framework and 2) a survey, based on the author’s experience of the study area, to gather attitudes and perceptions toward minority groups and how they relate to housing values.

Can (1998) establishes a spatial framework consisting of an exploratory spatial data analysis (ESDA) and a confirmatory data analysis (CDA). However, a series of changes were incorporated to improve on her research design in terms of both the exploratory spatial data analysis and the confirmatory data analysis sections. The improvement for the exploratory spatial analysis section consists of the use of Gi* which identifies hot and cold spots (i.e. locations with significant high or low percentages of minorities). In addition, Geographically Weighted Regression (GWR) is used to incorporate “local spatial relationships into regression framework in an intuitive and explicit manner” (Fotheringham et al., 2002, p. 27).

Scatter Plots

This study employs scatter plots in order to determine whether or not a pattern of median housing values exists in relation to Cubans, Dominicans, Afro-Puerto Ricans, and Puerto Ricans. The scatter plot displays individual values for two variables in a graph of Cartesian coordinates. A scatter plot is used for
“determining the average relationship indicated by the scatter of points” (Yeates, 1974, p. 68). A scatter plot for each of the groups vis-à-vis housing values might suggest interesting relationships.

_Spatial Association and Gi*

Identifying unique spatial arrangements for feature values (i.e. the attributes associated with a geographic feature) across space is often at the core of a geographical analysis. Clusters of similar feature values can expose patterns that can help lead the researcher and their identification is an important first step in understanding the underlying processes which might produce these patterns. These geographically interesting clusters can be viewed as exhibiting the phenomenon of spatial autocorrelation, which “may be defined as the relationship among values of a single variable that is attributable to the geographic arrangement of areal units” (Griffith and Amrhein, 1991, p. 134). Spatial association or autocorrelation often produces a “systematic pattern in the spatial distribution of the data values” (Can, 1998, p. 72) and often attracts geographers’ attention.

In this research spatial patterns are examined for different racial/nationality attributes. This research examines if a pattern of clustering exists for minority groups in Puerto Rico, including Dominicans, Cubans, and
Afro-Puerto Ricans, across the study area. The patterns are examined through the use of Gi* and the calculation of a Z-Score for each of the attribute’s values.

One distinction must be made between the two most common methods of spatial association, global measures and local measures. The Moran’s Index $I$ is the most common global measure of spatial association and Gi* is the most common local measure of spatial association. Global measures of spatial association produce a single statistic for the entire study area and indicate if similar values are clustered somewhere in the study area. Local measures produce a statistic for each feature (e.g. census tract, county) in the study area and indicate if the clustering of similar attribute values occur and where it occurs. Although both Moran’s $I$ and Gi* can be used to examine racial/ethnic clustering in space, they are different measures and must be interpreted differently. Moran’s $I$ identifies clusters of similar values – whether they are clusters of high values or low values (Mitchell, 2005). On the other hand, Gi* is able to identify whether clusters are groupings of high values (hot spots) or low values (cold spots). Gi* is used when you “want to include the value of the target feature since its value contributes to the occurrence of the cluster” (Mitchell, 2005, p. 175).

In addition, Gi* is able to perform a “decomposition of global indicators [...] into the contribution of individual observations” (Anselin, 1995, p. 94). As Anselin (1995) suggests, “this is of interest to assess the extent to which the
global statistic is representative in the average pattern of local association” (p. 97). He explains, “in other words, local values that are very different from the [global] mean (or median) would indicate locations that contribute more than their expected share to the global statistic” (Anselin, 1995, P. 97). It is because of these distinctive properties that Gi* is used in this research.

Gi* is basically a pair-wise comparison test where a feature is compared to its neighbors. If a feature value is high and its neighbor values are high (in proportion to the study area global mean), the cluster is identified as a hotspot. A hotspot is a cluster of features whose attribute values are higher in magnitude than you might expect to find by random chance (ESRI, 2008). If a feature value is low and its neighbor values are low (in proportion to the study area global mean), the cluster is identified as a cold spot. A cold spot is a cluster of features whose attribute values are lower in magnitude than you might expect to find by random chance.

The Gi* statistics is essentially a weighted Z score where the expected value of the test statistic is subtracted from the observed value and standardized with some measure of variance of the data. According to ESRI (2007), the operational formula for the Gi* is as follows:
\[ G_i^* = \frac{\sum_{j=1}^{n} w_{i,j} x_j - \bar{X} \sum_{j=1}^{n} w_{i,j}}{\sqrt{n \sum_{j=1}^{n} w_{i,j}^2 - \left( \sum_{j=1}^{n} w_{i,j} \right)^2 \frac{n}{n-1}}} \] (1)

where:

- \( x_j \) is the attribute value for feature \( j \)
- \( w_{i,j} \) is the spatial weight (based on inverse distance) between feature \( i \) and \( j \)
- \( n \) is the total number of features

\[ X = \frac{\sum_{j=1}^{n} x_j}{n} \], and

\[ S = \sqrt{\frac{\sum_{j=1}^{n} x_j^2}{n} - \left( \bar{X} \right)^2} \] (3)

In calculating the Gi* scores for the study area, all census tracts were considered neighbors but their interactions were inversely weighted by distance.

**Spatial Relationships and Geographically Weighted Regression**

The primary objective of this dissertation is to explore the impacts of race and nationality on housing value. The univariate Gi* technique can identify the
locations of significant clusters of racial/nationality groups but a more sophisticated technique, geographically weighted regression (GWR), is required to determine if these clusters have any impact on housing value. GWR expands the research to the analysis of local variations. In addition, instead of one measure for the entire study area, GWR generates a measure for each and every location in the study area. One of the most useful aspects of GWR is the importance of locality. As Fotheringham et al. (2002) suggest, “locality is important and measuring local relationships is vital to understanding spatial processes” (p. 253).

Geographically Weighted Regression (GWR) is an “alternative method for the local analysis of relationships in multivariate data sets” that “is based on the traditional regression framework” (Fotheringham et al., 2002, p. 27). This statistical technique “incorporates local spatial relationships into the regression framework” (Fotheringham et al., 2002, p. 27).

Figure 14. Spatial Kernels (After Fotheringham, Brunsdon and Charlton, 2002)
GWR enables the examination of spatially varying relationships in regression analysis. GWR is a technique in which a unique regression analysis is performed on each and every observation in the dataset. As depicted in Figure 14, a spatial kernel is placed around each observation in the dataset. Those observations falling within the spatial kernel are used to solve the regression equation.

Most importantly, each observation falling under the spatial kernel is weighted according to its proximity to the regression point. “Data points closer to the regression point are weighted more heavily in the local regression than are data points farther away” (Fotheringham et al., 2002, p. 44). GWR provides a mechanism for allowing the size of the spatial kernel to adapt. In areas where observations are abundant the bandwidth (size) of the spatial kernel can be smaller than in areas where observations are sparse. This emphasis on spatial weighting corresponds to the geographical belief that proximity is important in explaining or predicting attribute values at a particular location.

GWR is a useful statistical technique for research on housing values “because real estate is location specific, the movement in house prices is of interest primarily at the local level” (McPherson and Sirmans, 2001, p. 81). The approach of GWR incorporates local exceptions rather than searching for global generalizations for the dependent variable of interest. In other words, GWR quantifies the extent that a relationship between independent and dependent
variables varies over geographic space. One advantage of this statistical
technique is its ability to manage spatial dependency. Unique local relationships
can be lost in the process of generalization to the global. A standard regression
analysis typically will not take into consideration spatial dependency. Therefore,
an Ordinary Least Squares (OLS) regression will count every observation as
equal. A more specific description of the relationships among variables (i.e.
spatial dependency) can give us valuable insight into the analysis of spatial
processes. Thus, spatial dependency refers to geographically close observations
that are more related because of their proximity, corresponding to Tobler’s Law.
Fotheringham et al. (2002) explain:

Global statistics are typically single valued: examples include a
mean value, a standard deviation and measure of the spatial
autocorrelation in a data set. Local statistics are multi-valued:
different values of the statistics can occur in different locations
within the study region (p. 6).

Fotheringham et al. clarify the mechanics of GWR in which the OLS
regression model (Equation 4) is extended “by allowing local rather than global
parameters to be estimated.” (2002: 52). The OLS regression equation 4 can be
rewritten to produce the general form of the GWR equation 5.
\[ y_i = \beta_0 + \sum_k \beta_k x_{ik} + \epsilon_i \]  
\[ y_i = \beta_0 (u_i, v_i) + \sum_k \beta_k (u_i, v_i)x_{ik} + \epsilon_i \]

In Equation 5, \( y_i \) is the dependent variable. The second part of the equation, \( \beta_0 (u_i, v_i) \), is the intercept at point \( i \). The next section of the equation is the realization of the kernel for each variable at point \( i \). The kernel indicates spatial variability across the surface. The symbol \( K \) is the number of independent variables. The final term of the equation, as in global regression, is the error (\( \epsilon \)) for point \( i \).

In summary, this section has explained the basic idea of Geographically Weighted Regression. The advantage of representing local forms of spatial analysis enhances the capability of examinations of spatial processes. Geographically Weighted Regression generates a more precise depiction of the study area due to the inclusion of local forms of spatial analysis rather than one average number to represent the whole study area. This method recognizes variability across space.
Modifiable Areal Unit Problem and Area-Based Spatial Interpolation

Very often geography and other sciences that use spatial statistics have to face difficulties such as the modifiable areal unit problem (MAUP). The MAUP appears when data is assigned to a specific boundary. In other words, it is a potential source of error that can affect the outcome of spatial studies. Heywood et al. (1998) suggest that:

Even population distribution may be assumed across an area of similar housing type, but in an area of mixed land use (for example housing, parkland and industrial estates) it cannot. Aggregation, diseggregation and classification errors are all combined in the modifiable areal unit problem (p. 190).

There are two components of the MAUP: the scale effect and the zoning (or cross-area aggregation) effect. The scale effect problem refers to the results obtained from the same statistical analysis that will differ according to the size of areal unit. For example, imagine a U.S. population map by state. Obviously, a more accurate population map can be drawn using a smaller areal unit such as county or, even better, township.

The zoning or cross-area aggregation effect problem refers to the reorganization of areal units at any given scale. For instance, the problem that
many longitudinal studies face is the zoning or aggregation effect in which many boundaries change across time. Imagine an area covered by two rectangular units arranged vertically to subdivide an area, and then ten years later two rectangular units are arranged horizontally subdividing the same area. Of course, this situation might be much more complicated in a real case.

It is clear that geostatistical research will be influenced by the nature of the spatial units themselves, which may lead to problems during the statistical interpretations of the outcome of the analysis.

Researchers must be aware of the implications of the MAUP. The two components of MAUP require us to take certain measures to overcome, or at least minimize, this problem. On the one hand, the scale effect component can be minimized with the use of more detailed, smaller geographical units. However, it is not always the case that the researcher can find spatial units with such level of detail. On the other hand, the zoning or cross-area aggregation effect can be managed through area-based spatial interpolation (see Wang, 2006). Wang (2006) explains, “the method apportions the attribute value from each source zone to target zones according to the areal proportion” (p. 47).

This research minimizes the scale effect problem acquiring the smallest unit possible for which data are available. Unfortunately, the ideal smallest unit for this research, the housing unit, is not available, and neither are census block data because the U.S. census cannot compromise the privacy of residents.
Therefore, census tracts are the smallest available unit. Areal interpolation is used to minimized the problem of zoning or cross-area aggregation effect which results from the aggregation of boundaries. Following Wong, “[a]real units are assumed to be represented by their centroids, and then a point-based method is used to interpolate attributes in areal units as approximation” (Wong, 2006, p. 47). This procedure does transfer data from a source zone to a target zone according to the areal proportion while assuming an even distribution of the data in each source zone. Although not perfect, this method is widely used because reduces the zoning or cross-area aggregation effect. The area-based spatial interpolation is a method that commercial data providers, such as Geolytics, utilizes in order to normalize data for comparisons across time.

*Survey*

The survey used in this research (see Appendix B and C) is an essential component of the analysis because it provides information that cannot be obtained from census data. The information collected in this survey includes factual information as well as attitudes and perceptions from a sample population for each of the four neighborhoods selected for the study area. The survey helps to examine attitudes and perceptions patterns and how they relate to minority status and housing value patterns.
A geographically systematic sampling approach was used to gather information on three of the four neighborhood selected. McGrew and Monroe (2000) define a systematic sampling method as the use of a “regular sampling interval (k) between individuals selected for inclusion in the sample” (p. 90). McGrew and Monroe (2000) expand on this procedure:

A ‘1-in-k’ systematic sample is generated by randomly choosing a starting point from among the first k individual s in the sampling frame, then selecting every kth individual from a starting point (p. 90).

One neighborhood was subjected to simple random sampling because the peculiar characteristics of the area made it impossible to maintain a systematic method. This neighborhood, because its proximity to the University of Puerto Rico, has a high level of renter occupancy, with the majority of the renters being college students. The occupants use these housing units to sleep, while during the day they are either at the university or working. During weekends, they work or return to their parents’ house. Since the surveys were conducted on Saturdays, many of the residents of this neighborhood were unavailable. This forced the use of a simple random sample method for this area. Table 2 shows details about the neighborhoods, including the number of household units and sample size.
Table 2. Neighborhoods included in the Research

<table>
<thead>
<tr>
<th>City</th>
<th>Neighborhood</th>
<th>Household Units</th>
<th>Sample Size</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Juan</td>
<td>Los Angeles</td>
<td>1,300</td>
<td>66</td>
<td>Random</td>
</tr>
<tr>
<td>Carolina</td>
<td>Roosevelt</td>
<td>2,192</td>
<td>67</td>
<td>Systematic</td>
</tr>
<tr>
<td>San Juan</td>
<td>Ext. Forest Hills</td>
<td>3,155</td>
<td>67</td>
<td>Systematic</td>
</tr>
<tr>
<td>Bayamón</td>
<td>Santa Rita</td>
<td>2,006</td>
<td>66</td>
<td>Systematic</td>
</tr>
</tbody>
</table>

The sample size was limited due to economic resources and time. For this reason the confidence level of the sample size was down to 90 percent while the confidence interval was at 10 percent. The confidence level “refers to the probability that the interval surrounding a sample mean encompasses the true population mean” (McGrew and Monroe, 2000, p. 101). In other words, there might be a fluctuation of 10 percent, plus or minus, in the surveys’ answers. The confidence interval is a range in which the true value is likely to exist. In other words, “a confidence interval, or bound, represents the level of precision associated with the population estimate” (McGrew and Monroe, 2000, p. 98). Despite these issues, the survey remains the best method to address a series of specific questions for this research.

The sample size was calculated using the following formula:

\[
\text{Sample Size} = \frac{Z^2(p)(1-p)}{C^2}
\]  

(6)
Where $Z$ is equal to the Z value associated with a 90% confidence level (1.64), $p$ is equal to the probability of a respondent picking a choice (0.5) and $C$ is equal to the confidence interval (0.10).

Each of the neighborhoods sampled has a finite population; therefore an adjustment to the sample size is necessary since Equation 6 is based on the assumption of a very large population. The finite population adjustment to the sample size is calculated as follows:

\[
Adjusted \ \ Sample \ \ Size = \frac{sample \ \ size}{1 + \frac{(sample \ \ size - 1)}{population \ \ size}} \quad (7)
\]

The survey question addresses various topics. For instance, one part of the survey addresses the resident’s perception in evaluating the effect of housing value within other community’s context. Basically, this part of the survey compares the participants’ neighborhood to others. A different section in the survey attends to the participants’ perception about the status of their neighborhood characteristics as well as in four other neighborhoods. In this way, each resident is assessing their perception about their neighborhoods in contrast to others. Following this section, another section of the survey examines the participants’ perceptions in assessing the impact of neighborhood characteristics on housing value. The final section of the survey examines participants’
attitudes and perceptions about the relationship between minority groups and housing values.

The last section creates the foundation to suggest a tendency related to the association of minority groups to housing value. Generally, the survey identifies a trend for one specific minority group. Following this question the participants had the opportunity to explain their answers.

Summary

This chapter presents an overview of the quantitative and qualitative methods of this dissertation. The use of local indicators of spatial associations helps to reveal areas of special interest for more in-depth examinations. Global regression models are used to examine median housing value. Furthermore, the used of Geographically Weighted Regression examines local exceptions in housing value patterns. In addition, unlike global regression, GWR accounts for spatial variability. Finally, the survey targets four communities according to their characteristics in relation to minority presence.

The dissertation’s objectives require the use of both quantitative and qualitative methods. Particular attention must be devoted to exceptions across space due to the different characteristics of all neighborhoods across the study area. Also, special consideration must be given to issues related to the data on
which this work is based. The next chapter discusses the data for this dissertation.
Chapter 6

Data Sources

Introduction

Data for this research were acquired from the 2000 U.S. Census of Population and Housing as well as a field survey instrument. The use of aggregate data from the U.S. Census at the census tract level in conjunction with a field survey instrument enabled this research to be conducted at the neighborhood level.

Different internal and external factors might influence the cost of a housing unit (Adair, Berry, and McGreal, 1995, p. 20). External factors include location and other visible factors of the neighborhood or area. Internal factors are direct characteristics of the housing units themselves such as age, dimensions, and amenities (Adair, Berry, and McGreal 1995, p. 21). This study focuses on the external factors that affected housing value, and specifically characteristics of the neighborhoods themselves. This focus on the neighborhood is important because a housing unit is fixed in a particular neighborhood. Therefore, neighborhood characteristics will likely be highly influential in determining housing value.
The neighborhood characteristics used as independent variables in the quantitative analyses were selected based on a methodology proposed by Can (1998) in which she suggests that four major factors across neighborhoods may lead to positive or negative externalities on residents. These factors are (1) accessibility; (2) physical environment; (3) social, economic, and demographic context; and (4) public-service provision. Data representing these four factors were obtained from the U.S. Census and will be discussed first. Discussion of the survey instrument and the study area follows.

United States Census

Data items collected for the 2000 U.S. Census for Puerto Rico parallel those collected for other areas of the U.S. and, therefore, include data about ethnicity and national origin. This research closely examines how these neighborhood characteristics (i.e. the presence of ethnic/national groups) impact the median housing value in the study areas.

Ordinary Least Squares (OLS) regression is the first statistical methodology used to examine the relationship between ethnicity/national origin and housing values. The variables used in the OLS regression analysis are shown in Table 3. All data from Table 3 were taken from the 2000 U.S. Census. The variables quantifying the presence of Blacks (X2), Cubans (X3), and Dominicans (X4) were included in the regression analysis to capture the unique
social dynamic of Puerto Rico, a Latin American country. The variable Dominicans (X4) became the focus of attention because Dominicans are the largest foreign minority group in Puerto Rico.

<table>
<thead>
<tr>
<th>Neighborhood Characteristic</th>
<th>Variables</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>DV</td>
<td>DV</td>
<td>Median Housing Value</td>
</tr>
<tr>
<td>SED / PSP</td>
<td>X1</td>
<td>Education</td>
</tr>
<tr>
<td>SED</td>
<td>X2</td>
<td>Blacks</td>
</tr>
<tr>
<td>SED</td>
<td>X3</td>
<td>Cubans</td>
</tr>
<tr>
<td>SED</td>
<td>X4</td>
<td>Dominicans</td>
</tr>
<tr>
<td>PE</td>
<td>X5</td>
<td>Occupied</td>
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<td>PE</td>
<td>X6</td>
<td>Own</td>
</tr>
<tr>
<td>A</td>
<td>X7</td>
<td>Travel time to work</td>
</tr>
<tr>
<td>SED</td>
<td>X8</td>
<td>Median HH Income</td>
</tr>
</tbody>
</table>

Note: SED = Socio-Economic-Demographic Context, PSP = Public Service Provision, PE = Physical Environment, A = Accessibility, and DV = Dependent Variable

Variables X1, X2, X3, X4, and X8 represent the social-economic-demographic component of Can’s methodology. More specifically, variable X1 corresponds to the social capital of education (specifically the percentage of persons 25 years of age or older with a bachelors degree or higher). In addition, variables X2 (Blacks), X3 (Cubans), and X4 (Dominicans) are specific to the
demographic component of Can’s socio-economic-demographic factor. These groups represent the largest minority groups in Puerto Rico.

Variable X5 captures the level of occupancy in each neighborhood and is represented as the percentage of total housing units occupied. Variable X6 captures the level of owner occupied properties in a neighborhood and captures the Physical Environmental factor in Can’s methodology. Variable X7, percentage of persons with a relatively short commute to work (0 to 29 minutes, captures the accessibility factor of Can’s methodology. Finally, X8, which is median household income, captures the economic component of Can’s socio-economic-demographic factor.

These variables have been selected due to the character of neighborhood effects and their power in the housing market behavior and outcomes (Can, 1998). In general hedonic models do not recognize the importance of geographic location. The incorporation of neighborhood characteristics and the inclusion of spatial statistics expand the accuracy and comprehension of information on neighborhoods characteristics and housing values.

Survey

Arguably, the one question in the U.S. Census that draws most heavily on self-perception is the self-determination of race or ethnicity. In this research a field based survey instrument was used to collect and explore neighborhood
residents’ perceptions about minority groups and housing values in specific areas within the San Juan MSA, Puerto Rico. The questions related specifically to the perceptions of the participants in each of the four communities surveyed are detailed below:

1) If your house were in [Old San Juan, Loíza, Torrimar, and Villa Palmera] how would it change your housing value?

2) What is your opinion about the roads in [Old San Juan, Loíza, Torrimar, and Villa Palmera]?

3) What is your opinion about the garbage service in [Old San Juan, Loíza, Torrimar, Villa Palmera, and your neighborhood]?

4) What is your opinion about safety in [Old San Juan, Loíza, Torrimar, Villa Palmera, and your neighborhood]?

5) What is your opinion about the school quality in [Old San Juan, Loíza, Torrimar, Villa Palmera, and your neighborhood]?

6) What is your opinion about the amount of housing units for rent in [Old San Juan, Loíza, Torrimar, Villa Palmera, and your neighborhood]?

7) In a scale from 1 to 5, lowest to highest, what do you think is the level of formal education in [Old San Juan, Loíza, Torrimar, Villa Palmera, and your neighborhood]?
8) In a $100,000 house, how do you perceive the effect on housing value if [roads, garbage service, public safety, school quality, units for rent] improve[s] or increase[s]?

9) If [Cubans, Dominicans, Afro-Puerto Ricans, Whites] double in your neighborhood, what do you think will occur to the housing value?

The U.S. Census data allowed for the identification of appropriate neighborhoods to be surveyed. In other words, the data from the census provided a view at the macro-scale level. Data gathered from the fieldwork allowed for a closer examination at the micro-scale level and enabled exploration of neighborhood dynamics regarding minority groups and housing values.

Study Area

The study area for this research was located within the San Juan metropolitan statistical area (MSA), Puerto Rico. San Juan is the largest metropolitan statistical area of Puerto Rico. This study area was chosen because of its history of nearly continuous urban growth and sprawl. Generally, we can identify the following municipios (administrative areas roughly equivalent to U.S. counties): Dorado, Toa Baja, Toa Alta, Cataño, Bayamón, Guaynabo, San Juan, Carolina, Loíza, and Canóvanas as those areas of the greater San Juan MSA where much of the construction activity related to urban sprawl has been concentrated. Basically, these areas are bounded by the Río La Plata and Río
Grande de Loíza rivers which have worked for a long time as natural barriers containing urban growth.

Four neighborhoods were surveyed within the study area. These neighborhoods share some similarities but also some differences. The neighborhood of Santa Rita, located in the Río Piedras district, has several peculiarities. First, because the main campus of the University of Puerto Rico is located nearby, large numbers of the residents in this neighborhood are university students. Also, over 10 percent of the residents in Santa Rita are Dominicans. Actually, the area of Río Piedras hosts an increasing number of this foreign minority group. The selection of respondents in this neighborhood was slightly different from the other neighborhoods given the previously mentioned particularities and the difficulties of surveying multi-family housing dwellings.
Another neighborhood surveyed was Los Angeles, Carolina, which also has a Dominican population over ten percent. However, this neighborhood is adjacent to the island’s large international airport and the Dominican residents here are relatively disconnected from the Dominican community of the Santurce area.

The third area surveyed is a group of three neighborhoods (Roosevelt, Hyuke, and El Vedado), hereafter referred to as Roosevelt, which are spread across two census tracts. This area is relatively distant from the Dominican
communities of Santurce and Río Piedras. The Dominican population in these neighborhoods is around three percent of the total population.

The final area included in the field survey is Extensión Forest Hills, Bayamón. *Extensión* is a Spanish term which roughly translate to English as “adding to an existing housing development.” Like Roosevelt, Extension Forest Hills is just one of two neighborhoods that cross two census tracts. The other neighborhood surveyed was Flamboyán Gardens. These neighborhoods are located in Bayamón. These neighborhoods are distant from any neighborhood in which the Dominican population is above ten percent and even more separated from the Dominican community of Santurce. Of all four neighborhoods surveyed, Extension Forest Hills and Flamboyán Gardens are most familiar to the author.

**Summary**

The regression analysis provided a general view at the macro-scale level which enabled exploration of the whole study area and allowed the identification of possible areas to be surveyed. This analysis employed regression methods. In addition, data from the 2000 U.S. Census are also used to perform Gi* analyses. The second part of the analysis, the survey research, explored exceptions within the study area.
Chapter 7

Statistical Results, Analysis, and Interpretations

Introduction

This chapter provides the results of the dissertation research. The first section presents the results of the four graphical/statistical exploratory analyses: scatter plots, global regression, Gi*, and Geographically Weighted Regression (GWR). Chapter 8 presents the results of the field survey. The analysis and interpretation of these results are discussed in Chapter 9.

The graphical/statistical exploratory analyses provide an overview of the entire study area. In other words, they provide a macro-scale examination of the research area. In the statistical exploratory analysis several techniques were used. This dissertation used both global and local techniques. Global techniques used were a graphical analysis and ordinary least squares (OLS) regression. The graphical technique plotted the percentage of each minority group by census tract against median housing value for that census tract. This technique provides a broad picture of the overall relationship between each of these variables. The global regression summarized data for the whole study region providing a single value for each of the independent variables and is aspatial. Local techniques
used were Gi* and geographically weighted regression. Local regression allowed for the diseggregation of the global data, provided estimates at multiple locations across the study area, and thus was intrinsically spatial. The local regression emphasized differences across space. The use of ordinary least square (OLS) regression examined variables that impact housing values in the study area using data from the U.S. Census of Population and Housing for the year 2000. The Gi* identifies hot and cold spots. The map showed clusters of high values surrounded by high values and clusters of low values surrounded by low values. In addition, and most importantly, a comparison between an OLS and GWR shows local exceptions that might influence median housing values as well as the importance of the GWR’s ability to account for spatial variability.

Results of the Statistical Analysis: Graphical Analysis

First, relationships between median housing value and the percent of population’s minority per census tract (the unit of analysis) were examined. It is possible to identify a series of contrasting patterns among the three predominant minority groups identified in this study. Examining each group separately and, later together might uncover patterns. Figures 16, 17, and 18 show the median housing value for the percent of Cubans, Dominicans, and Afro-Puerto Ricans per census tract respectively. Figure 19 shows the median housing value for
percent of Puerto Ricans (the majority group) per census tract while Figure 20 shows the median housing value for all minority groups together.

Cubans

Figure 16. Cuban-born Population per census tract vis-à-vis Median Housing Value
Figure 16 shows the median housing value per percent of Cuban by census tract. The scatter plot presents a conspicuous agglomeration below $100,000 for the census tracts containing about one percent of Cubans. However, the trend line uncovers that an increase the percentage of Cuban population per census tract is associated with an increase in the median housing value.

It is important to point out possible reasons for this pattern. First at all, many of the Cubans that arrived in the first wave of migration were businessmen, entrepreneurs, and part of the upper class who disagreed with the Cuban revolution. In addition, many Cubans became U.S. citizens like Puerto Ricans. Another reason is that Puerto Ricans tend to perceive Cubans as being white. Therefore, it is the combination of these attributes that might help to understand this dynamic.

*Dominicans*

Like Figure 16, Figure 17 shows an agglomeration under $100,000. Although there are a few census tracts reaching $400,000 and various between $100,000 and $300,000 the trend line uncovers another tendency. The trend line on Figure 17 presents a decreasing tendency: as the percentage of Dominicans increases per census tract the median housing value decreases.
Although the first wave of Dominican migration consisted of professionals and intellectuals the other waves of migration have been related to economic reasons. Many Dominicans in Puerto Rico occupied jobs that are not attractive to the majority of the Puerto Ricans. In addition, Dominicans are seen
very often as illegal immigrants and as being black. Consequently, they are placed at the bottom of a racial hierarchy in Puerto Rico, and this is likely reflected in Figure 17.

*Afro-Puerto Ricans*

Figure 18. Afro-Puerto Rican Population per census tract vis-à-vis Median Housing Value

Figure 18 reveals a similar pattern to that of Figure 17 where the percentage of Afro-Puerto Ricans increases in the census tract as the median
housing value decreases. There is an agglomeration of census tracts below $100,000 for those tracts with around 20 percent of Afro-Puerto Rican population. While there are a few census tracts reaching a median housing value of $400,000 and various tracts between $100,000 and $300,000 there is a conspicuous group of about eight census tracts with an Afro-Puerto Rican percent greater than 50 percent in which the median housing values do not reach $100,000. This group is representative of the town of Loíza which has majority black population.

*Puerto Ricans*

As with the other national/ethnic groups, Figure 19 shows an agglomeration of census tracts below the median housing value of $100,000. Curiously and similar to other national/ethnic groups except Cubans, the trend line reveals an inverse relationship in which the greater the percent of Puerto Ricans per census tract the lower the median housing value.

It is interesting to notice the declining trend for median housing value as the Puerto Rican percentage increases. This might be a reflection of the large segment (around 45 percent) of the population that lives under the poverty line (U.S. Census, 2000). Besides skin color, mobility in Puerto Rico might be associated with income and migratory status.
Figure 19. Puerto Rican-born population and Median Housing Value
Figure 20 shows the percentage of all national/ethnic groups per census tract and median housing value with its respective trend line within the study area. There are various similarities among all national/ethnic groups. First, all national/ethnic groups are represented across the entire spectrum of median housing values. Second, the bulk of every group is around the $100,000 median housing value and there are just a few tracts that reach $400,000. In addition, all
the minority groups (Cubans, Dominicans, and Afro-Puerto Ricans) are displayed in the lower percentage as is expected and the majority group, Puerto Ricans, are presented at the right. The Afro-Puerto Ricans are the only exception in which they are majority in the town of Loíza.

However, there is a noticeable contrast. The trend line for all groups, except Cubans, shows an inverse relationship. For all national/ethnic groups, with the exception of Cubans, the graph shows them around the median housing value of $100,000 suggesting that the majority of the people in these groups are in a middle and low socio-economic class. In a way, the graph shows the reality of any group and its difficulty to join a higher socio-economic class. At the same time, the graph clearly shows the national/ethnic group of Cubans with a different trend, which has its particular historical explanations, previously discussed in Chapter 3.

The graphical analysis provides only the broadest indications of the relationship between the presence of minority groups and housing values. Few researchers would argue against the idea that housing value is influenced by many factors. The next section takes a more complex (multivariate) view of the global influences on housing value.
Results for Gi*

As stated in Chapter 1, the first objective of this dissertation was to explore the spatial distribution of the racial/ethnic minority groups in Puerto Rico. Examination of these spatial patterns is necessary to provide context for interpreting the spatial patterns of the multivariate analysis presented later in this chapter. To identify significant clusters of racial/ethnic minorities a Z-score adjusted Gi* statistic was calculated for each census tract in the study area. A statistically significant positive (> 1.96) Z-score adjusted Gi* statistic indicates a census tract with a high percentage of a minority group surrounded by other census tracts with high percentages of the minority group. These areas are called hot-spots. A statistically significant negative (< 1.96) Z-score adjusted Gi* statistic indicates a census tract with a low percentage of a minority group surrounded by other census tracts with low percentages of the minority group. These areas are called cold-spots. Z-score adjusted Gi* statistics were calculated for each census tract in the study area and mapped. As Figure 21, 22, and 23 show, there are various hot spots of minorities and one cold spot of minority groups through the study area. There are areas experiencing ethnic transition which might have an impact in housing values.

Figure 21 shows significant clustering of Afro-Puerto Ricans throughout the region, especially in the area of Loíza at the north east of the study area. In addition, a cold spot, significant clustering of tracts with low numbers of Afro-
Puerto Ricans, is shown in the central area of San Juan as well as in Santurce where is located the most prominent Dominican Community.

Figure 21. Z-Scores for $G^*$, Afro-Puerto Rican as a Percent of the Total Population

Figure 22 shows the results for those clusters with high percentages of Cubans. These clusters are located in the cities of San Juan, Guaynabo, and Carolina. Several of these hot spots are located in high-income neighborhoods such as Condado, in San Juan, and Isla Verde, in Carolina.
Figure 22. Z-Scores for Gi*, Cuban as a Percent of the Total Population

Figure 23, shows clusters with high percentages of Dominicans located in the cities of San Juan Carolina, and Bayamón. Several of these clusters are located in old and low-income neighborhoods such as Villa Palmera. In general, the Dominican clusters are limited to just a few areas in general are more concentrated that other minority groups.
Results for OLS Global Regression

Once these broad patterns have been noted another important question to address is, what variables other than the presence of minority groups have a significant impact on housing value for 2000? An OLS regression was performed in order to assess the strength of the association between the variables and the median housing value.
An OLS regression was performed with the dependent variable (median housing value) and several independent variables which have been shown to impact housing value. Additional independent variables are necessary because it is known that many factors other than the presence of minorities can influence housing value. The independent or control variables were educational attainment (% of residents 25 years of age or older with bachelor degree), percent Black population, percent Cuban population, percent Dominican population, level of home vacancy (% of occupied housing units), level of home ownership (% of owner occupied homes), travel time to work (% of population with a relatively short commute, 30 minutes or less) and finally, median household income. The analysis was performed using SPSS. The analysis revealed that the
model predicting median housing value for 2000 was statistically significant (F=114.800, p =.000).

Table 4 displays the model intercept and the unstandardized (B) and standardized regression coefficients (β) for each variable. The regression analysis revealed that the model explained a large portion of the variation in median housing value for 2000 (R² = 0.76, adjusted R² = 0.75).

The graphical analysis and global regression provided insight into the relationships between median housing value and the presence of minority groups at the macro-scale. However, a basic tenet of geography is that phenomena differ from one location to another. In order to explore the relationship between housing value and minority groups at the local scale (i.e. variation from one location to another), local spatial analysis methods were used. The results of these local techniques are discussed below.

Results for Geographically Weighted Regression

Results from the Gi* analysis showed that there was significant clustering of national/ethnic minority groups across the study area. It follows that if there are meaningful spatial patterns to the presence of national/ethnic minority groups then there might be meaningful spatial patterns to the relationships between the presence of the minority groups and housing value. If the nature of the relationship (whether magnitude or direction) changes across space, the
relationship is said to be non-stationary. A GWR was performed to explore these spatial issues. The OLS regression analysis explained 74.8% of the variance in median housing value for 2000. Hence, there are other factors influencing the model. For instance, a standard OLS regression is unable to account for spatial variation across the study area. In order to determine if the GWR is an improvement over the OLS regression an analysis of variance (ANOVA) test was performed on the residuals of both methods. The analysis of variance tests the null hypothesis that the GWR model represent no improvement on the global model. The results are shown in Table 5 where it can be seen that the GWR model is a significant improvement on the global model. The GWR model explains 85.6% of the variance in median housing value for 2000.

<table>
<thead>
<tr>
<th>Type of Regression</th>
<th>SS</th>
<th>DF</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLS Residuals</td>
<td>234985967326.7</td>
<td>9</td>
<td>2609832970.7</td>
<td></td>
</tr>
<tr>
<td>GWR Improvement</td>
<td>30369691648.0</td>
<td>65</td>
<td>4896481329.0514</td>
<td>4.4408</td>
</tr>
<tr>
<td>GWR Residuals</td>
<td>04616272597.0</td>
<td>233</td>
<td>449575209.2463</td>
<td></td>
</tr>
</tbody>
</table>

In addition, the GWR model offers a _t-surface_ which can be used as an exploratory tool “to highlights parts of the [study area] where interesting relationships appear to be occurring” (Fotheringham et al., 2002, p. 134).

Following this method, Figures 24, 25, and 26 explore the results for the _t-surface,_
which display absolute $t$ values for different minority groups across the study area.

Figure 24 shows the *t*-surface for the variable Afro-Puerto Ricans. Basically, the significant and highly significant *t*-surface covers the central region of the study area. Notice how the *t*-surface overlaps with three of the four surveyed areas and, almost in its totality, the municipios of Bayamón, Guaynabo, San Juan, and Trujillo Alto. Figure 25 shows a significant and highly significant local relationship of the variable Cubans mainly in the municipio of Trujillo Alto. Figure 26 is even more fascinating showing both a hot and cold spots. The GWR reveals the weaknesses of an OLS. The OLS relationship between Dominicans and median housing values is significantly negative with a $t$ value of $-3.26$ (Table 4) suggesting that in general Dominicans adversely affect the Median Housing Value. This would seem a strong argument for those against Dominicans. However, Figure 26 shows that the majority of the local estimates do not exhibit strong negative relationships between Dominicans and Median Housing Values. There are just two areas in the entire study area that exhibit a strong negative relationship between Dominicans and Median Housing Values. Nevertheless, there is also an area in which Dominican positively relates to Median Housing Values.
Figure 24. *t*-surface for Afro-Puerto Ricans
Figure 25. *t-surface* for Cubans
Figure 26. *t*-surface for Dominicans
The GWR helps to identify neighborhood effects on housing value unlike a regular aspatial regression. Clearly, relationships between variables measured at different locations might differ across space and GWR helps to identify these variations. Therefore, GWR pointed out one of the disadvantages of the global regression model (OLS).

Analysis and Interpretations of Gi*

Following the variable of Dominicans, a map showing the Z-score values of the Gi* statistic illustrates clusters of noticeable Dominican population in various census tracts of the study area. First, the Z-Score maps were used to examine clusters of features with minority levels higher than you might expect to find by random chance.

The Cuban location pattern occurred in upper class and middle upper class areas. However, the economic condition of Cubans, especially those that arrived in the first migration was totally different from the other groups which allowed them to locate in exclusive residential zones of the metropolitan area. The location pattern for Afro-Puerto Ricans and Dominicans differs from the Cubans and are related mainly to attitudes and perceptions according to a racial hierarchy and migratory status (Kaplan and Holloway, 1998). The location of Afro-Puerto Ricans in Loíza has its origins in the period when the first settlers escaped from slavery, while the Dominican population mainly concentrated in
marginal and deteriorated areas close to the transit system. An explanation of the survey areas helps to illustrate some of the issues.

Within the study area, the survey focused on four different neighborhoods (shown in Figures 15, 29 and 43). However, there are two surveyed areas with Dominican population over ten percent (Los Angeles and Santa Rita) and another two surveyed areas with a Dominican population around three percent (Ext. Forest Hills and Roosevelt), each one evolves within a different context.

The Los Angeles neighborhood, in Carolina, has a noticeable Dominican population (11.50%) and the Santa Rita neighborhood, in Río Piedras (San Juan), has a Dominican population of 13.44%. The Dominican population in Los Angeles is more conspicuous. An avenue divides the Los Angeles neighborhood in half, and one of the fieldwork team members commented about the neighborhood of Los Angeles as being divided into “uptown” and “downtown” in which the latter contains a more noticeable proportion of Dominican residents. The Los Angeles neighborhood is relatively distant from the two main areas where Dominicans surpass 30% of the total population. The Dominican population of the Los Angeles neighborhood contrasts with other areas. For example, the Santa Rita neighborhood is next to the Río Piedras downtown area which is one of the areas where Dominicans surpasses 30% of the total population. However, the median income of the Los Angeles neighborhood is higher that the median income of the Santa Rita neighborhood. In addition,
college students, mainly from the University of Puerto Rico, heavily occupy Santa Rita neighborhood. This strongly contrasts with the Los Angeles neighborhood which is mainly made up of single family housing units.

The other two areas subjected to the survey were Roosevelt, also in San Juan, and Ext. Forest Hills in the city of Bayamón. The Roosevelt neighborhood was surveyed together with two other neighborhoods, El Vedado and Huyke, because the three neighborhoods are located within two census tracts. In a similar way, Extension Forest Hills was surveyed together with Flamboyán Gardens because the neighborhoods are split across two census tracts. That was the reason to survey the two census tracts: to follow the neighborhoods’ responses. Each one of the surveyed areas has its own context.

The Roosevelt neighborhood study area comprises two census tracts: one with less than two percent of Dominican population and the other with less than five percent. This area is partially surrounded by other neighborhoods with a Dominican population of between 10 to 20 percent, and is relatively close to Santurce, which is the area with the greatest concentration of Dominicans (but not as close as Santa Rita from Río Piedras). In addition, Roosevelt, and other neighborhoods, have been experiencing zoning changes from residential to commercial due to their central location between important major roads and their proximity to the central business district (Figures 27).
Analysis and Interpretations of OLS Global Regression

The global regression analysis for median housing value for 2000 was performed using variables which captured neighborhood characteristics. On the one hand, this model showed that the variable \textit{percentage of population with bachelor degree or more}, \textit{percentage of population commuting less than 30 minutes to work}, and \textit{median household income} resulted in a positive association with the dependent variable \textit{median housing value}. It is clear that education could provide more opportunities to earn a higher income thus increasing \textit{median household income} which in turn would increase the possibilities of acquiring a housing unit with a greater median housing value. Therefore, \textit{percentage of population with}
A bachelor degree or more was also expected to be positively associated with the dependent variable median housing value. At the same time there is a positive association with percentage of population commuting less than 30 minutes to work which indicates accessibility is important.

The model showed a negative association of the variables percent of occupied housing and percent of Dominican population vis-à-vis median housing value. Surprisingly, the global regression showed that the variable percent of occupied housing is negatively associated with the dependent variable median housing value. Percent of occupied housing measure those housing units that are occupied vis-à-vis the vacant housing units.

One possible explanation of these results could be related to the unplanned densification of the area. It is not uncommon to find a second or even a third story added to a single family house in many parts of Puerto Rico. These additions are added to create rental space. Figure 28 shows an extreme case in the neighborhood of Santa Rita where single family units have been altered to become multi-family dwelling units. The occupancy rates for these units are often very high and can result in overcrowding. The addition of a second story represents an increase in density and overload of the neighborhoods’ infrastructure which could result in a decrease in housing value.
In addition, the independent variable *percent of Dominican population* resulted in a negative association with *median housing value*. There were no significant results for other minority groups in the OLS regression analysis. In Puerto Rico, the Dominican population numbers 56,146. However, the results of the global regression should not be interpreted necessarily as Dominicans being a factor to lower housing values but more precisely, that Dominicans tend to occupy housing units with a low median housing value. Consequently, the global regression analysis results identify a negative association.
Analysis and Interpretations of Geographically Weighted Regression

The next step in the analysis was the use of Geographically Weighted Regression to test for local variations in the relationships as well as testing for spatial non-stationary effects. The geographically weighted regression focused on racial/ethnic variables after Gi* revealed significant ethnic concentrations across the study area.

A regression equation was created for each of the neighborhoods (census tracts) allowing the Geographically Weighted Regression analysis to uncover local relationships. In fact, GWR was able to improve on the amount of variance explained by the global regression by more than 10%. Moreover, the test for spatial variability of the parameters based on the Monte Carlo technique suggests that the local parameter estimates, for Percentage of Black (or Afro-Puerto Rican), are significantly non-stationary. In other words, the effect of Percentage of Black is not the same across the study area and its influence varies from one place to another capturing exceptions across the study area.

Thus, the GWR allows for the exploration of local variations at the neighborhood level. For instance, the global relationship between the variable percent of Dominican population vis-à-vis the dependent variable median housing value is significantly negative with a t value -3.26, suggesting that, in general, median housing values are lower when percent of Dominican population increases. However, Figure 26 shows that the majority of the local parameter estimates do
not exhibit any strong relationship between *percent of Dominican population* and *median housing values* within the study area. In fact, there appears to be two areas of the region where there is a strong negative relationship but also one area where there appears to be a strong positive relationship between *percent of Dominican population* and median housing values.
Chapter 8

Survey Results, Analysis and Interpretations

Introduction

The survey analysis provides a micro-scale examination of the neighborhood’s social interaction and provides context for discussion of this research. The survey was four pages in length and was administered in total to 266 participants across four different areas (Figure 29). The survey captured socio-economic data as well as attitudes and perceptions of the participants regarding the impact of neighborhood characteristics on housing value. Several scholars have previously emphasized the importance of neighborhood characteristics (e.g. Goodman, 1989; Thrall, 2002; Can, 1998). As Can (1998) argues,

Two unique qualities of housing – spatial fixity and durability – inextricably link housing purchase and subsequent residential satisfaction to its geographic location. In addition to the physical characteristics of the residential structure and its immediate site, wide arrays of neighborhood characteristics enter into the housing bundle due to the geographic location of the structure (p. 63).
In other words, scholars refer to neighborhood characteristics as important socio-economic factors impacting the housing market. Therefore, this section examines residents’ perceptions and attitudes towards neighborhood characteristics in relation to housing values.

Kiel and Zabel argue about the importance of location in determining housing values which suggests that “[t]he immobility of houses means that their location affects their values” (2008: 188). The study suggests that housing values are affected by location. Location factors are excluded in hedonic models. Kiel and Zabel (2008) suggest that neighborhood characteristics at geographic levels are important in the study of housing values.

Figure 29. Surveyed Areas Relative to Dominican Population
Race and Nationality

It is important to examine the intersection of race and nationality before further discussion about the survey results. In general terms, race and nationality refer to a common descent and culture. However, in a more detailed examination, race refers to the categorization of people throughout the conceptualization that of physical traits as the primary marker of difference (Eriksen 1996 and Fenton, 2003). By contrast, nationality refers to the idea that nations should be associated with a state (Fenton, 2003). In summary, both race and nationality refer to a common descent and culture. However, race is a concept that is related to the physical appearance of a person while nationality is a concept associated with a political connotation.

However, the concept of race varies across countries. This variation might be attributed to historical, political, or economic context. Consequently, there are different systems of racial classification in different countries and is impossible to understand the concept of race of a country using the set of values of race of another country.

It is precisely the use of racial categories from the U.S. Census, which are design for an American context, that collides with the categories gathered by the survey. As mention before, the survey deals with nationality and therefore Puerto Ricans identify by national origin and not by race. The survey was
prepared to provide context, and to compliment the statistical analysis (but not vice versa due to the nature of the study).

The census might provide other racial categories that make reference to the U.S. context. However, these categories have little to do with the Puerto Rican reality. Therefore, if the study would incorporate other racial categories from the census the results would not be accurate. In the same way, if the survey added the U.S. Census racial categories it would lose the capacity to provide context for the statistical analysis.

Recognizing the limitations and complexities of the Puerto Rican national and racial context permits the research to deal with the most important issue. The statistical analysis and the survey use data of national origin as a way to reconcile the differences between the U.S. Census and the Puerto Rican racial classification. There are issues about racial categorization, however this research does not aim to solve these problems, but rather to recognize them in a context that might provide useful information for the statistical analysis.

Perception of Selected Neighborhoods as Elements Impacting Housing Values

The first question of the survey asked participants to estimate their property value if their housing unit would hypothetically be located in other neighborhoods. The question was, If your house were in this neighborhood (Old San Juan, Loíza, Torrimar, and Villa Palmera) how would it change your housing value?
The purpose of this question was to provide context of the respondents’ neighborhoods. The survey presented four neighborhoods -- two of them generally accepted to be poor and two of them upscale. The neighborhoods used for the comparison are well known by the general population of Puerto Rico.

Each of these neighborhoods has their own characteristics. Old San Juan is the historic district located in the capital city. In general, Old San Juan can be identified as an upscale neighborhood with a large population of professionals. This area is also a popular tourist attraction and tourism related businesses are common here. The town of Loíza, is generally known for its high percentage of black population. Loíza is close to the International Airport but lacks good accessibility to it. According to the 2000 U.S. Census, 59.72% of Loíza’s population had incomes below the poverty level. Torrimar is located in Guaynabo city. Unlike Loíza, Guaynabo is recognized as a wealthy city. Indeed, among all municipios presented in this study, Guaynabo has the lowest percent of people under the poverty line. Torrimar is an upscale neighborhood with housing values easily reaching half a million of dollars or more. The last neighborhood is Villa Palmera, San Juan. Villa Palmera is an old neighborhood, poor, and contains a high percentage of Dominican population.

In general, respondents perceived that if their housing unit were located in the historic neighborhood of Old San Juan it would increase in value (Figure 30). In a similar way, respondents perceived that if their housing unit were
located in Torrimar it would increase in value (Figure 31) Both Old San Juan and Torrimar can be identified as upscale neighborhoods.

![Graph showing the results for Old San Juan](image-url)

*Figure 30. Results for Old San Juan*
If your house were in Torrimar, how would it change your housing value?

Figure 31. Results for Torrimar

The responses for both Old San Juan and Torrimar are substantially different for the other two neighborhoods: Loíza and Villa Palmera. These two neighborhoods share similar characteristics such as low-income levels and high percentage of minority population. Loíza has a high percentage of Black population. In fact, the percentage black population in Loíza is higher than the percentage white population. Villa Palmera has a high percentage Dominican population. The results for these neighborhoods are shown on Figures 32 and 33.
If your house were in Loíza, how would it change your housing value?

Figure 32. Results for Loíza

If your house were in Villa Palmera, how would it change your housing value?

Figure 33. Results for Villa Palmera
There is a clear pattern in the responses where participants perceived that locating in Old San Juan and Torrimar would increase their property values. The most notable characteristic of both Old San Juan and Torrimar is that they are upscale neighborhoods. In addition, Old San Juan is a historic district. According to Noonan (2007) “historic and landmark designation can affect prices of both the designated property and neighboring properties” (p. 27). Other studies support Noonan’s argument of historic designation and property values (e.g. Coulson and Lahr, 2005 and Coulson and Leichenko, 2004).

In contrast, the participants perceived that locating in Loíza or Villa Palmera would decrease their property values. The most prominent characteristic of these neighborhoods is that they have a high percentage of minority population: a high percentage of Black population in Loíza and a high percentage of Dominican population in Villa Palmera. There are many studies that point out this phenomenon, especially for Blacks (e.g. Myers, 2004; Reibel, 2000; and Kiel and Zabel, 1996). For instance, Myers (2004) suggests “house values fall as the percent of blacks in a neighborhood rises, indicating that high concentrations of Blacks may be perceived as a neighborhood disamenity by some consumers” (p. 299). Other studies include other minority groups such as Hispanics (e.g. MacPherson and Sirmans, 2001; Page, 1995). Therefore, the high
percentage of Blacks in Loíza as well as the high percentage of Dominicans in Villa Palmera may be seen as disamenities for the respondents in the survey.

Perception of Neighborhoods Characteristics and Housing Values

One of the survey questions requested the participants to assess the effects of neighborhood infrastructure for a $100,000 house. The neighborhood variables used for this question were: good roads, garbage service, security, quality of public schools, and large numbers of housing units for rent.

The majority of the survey participants responded, as shown Figure 34, that good roads would increase housing value. Participants were presented with a range of dollar values from which to choose: no change, $1 to $5,000; $5,001 to $15,000. They selected the category of one dollar to five thousand dollars most often indicating that quality roads would have a moderate impact on housing value.
For a $100,000 house, what is the effect on the property value if your neighborhood has good roads?

Similar responses were given for the effects of good garbage service on housing values (Figure 35). The most frequent response was *increase in housing value from $1 to $5,000* most frequently again indicating a moderate impact on housing value. The second most common answer was the selection of the category that represents a high increase in housing value where the value of the home would increase somewhere in the range from $5,001 to $15,000.
For a $100,000 house, what is the effect on the property value if your neighborhood has good garbage service?

Figure 35. Results for Perception of Good Garbage Service on Housing Value

For a $100,000 house, what is the effect on the property value if your neighborhood has good security?

Figure 36. Results for Perception of Good Security on Housing Value
Security, another neighborhood characteristic, resulted in predictable responses. The majority of the participants considered the effect of a secure neighborhood as strongly increasing housing value from $5,001 to $15,000 (Figure 36). In the same way, the second most common response was more moderate increase in value from $1 to $5,000. In fact, gated communities are very popular in Puerto Rico and the majority of the housing units will have any type of security device such as simple iron bars or alarm. The perception of security, of being safe, plays an important role in the Puerto Rican society.

The fourth neighborhood characteristic examined was the quality of public schools (Figure 37). In the U.S. families tend to move to a neighborhood based on the quality of public schools. However, this is not the case in Puerto Rico. Those who want good quality schools for their children enroll them in private schools. Here, the participants in two neighborhoods, Los Angeles and Ext. Forest Hills, perceived quality schools would increase housing values. The participants in Los Angeles and Ext. Forest Hills perceived that quality schools might increase the property value from $1 to $5,000 while the second most common answer was that quality schools might increase housing value between $5,001 and $15,000. In contrast, the participants of Santa Rita and Roosevelt neighborhoods perceived that good quality schools will bring no change to housing values.
For a $100,000 house, what is the effect on the property value if your neighborhood has good quality schools?

The last neighborhood characteristic that participants assessed was the presence of many housing units for rent in a neighborhood. The participants’ perception for the majority of the neighborhoods tended to be that many housing units for rent decreases housing value in the range from $5,001 to $15,000. That was the most common answer for Los Angeles, Roosevelt, and Ext. Forest Hills. However, for Ext. Forest Hills the second most common answer was a decrease in housing value in the range of $1 to $5,000. The participants of Santa Rita perceived a decrease in housing value in the range of $1 to $5,000. (Figure 38).
For a $100,000 house, what is the effect on the property value if your neighborhood has many housing units for rent?

Figure 38. Results for Perception of Housing Units for Rent on Housing Value

Perception of National/Ethnic Characteristics and Housing Values

The last question in the survey addressed the variable of national/ethnic composition and race vis-à-vis housing values. The respondents were asked about the effects of whites, blacks, Cubans, and Dominicans on housing values. The results for these questions are shown on Figures 39, 40, 41, and 42 respectively. The question asked was the following: “If [determined group] doubled in your neighborhood, what do you think will be the effect on the property value?”
If whites doubled in your neighborhood, what do you think will be the effect on the property value?

![Bar chart showing results for Whites and Housing Value](image)

Figure 39. Results for Whites and Housing Value

When the participants were asked their perceptions regarding housing values if whites doubled in their neighborhoods the most common answer was “no change.” Figure 39 shows that 83.6% of the participants in Los Angeles neighborhood and 86.4% of the participants in Santa Rita neighborhood responded no change. Similarly, 88.1% of participants in Roosevelt and 97% of the participants in Ext. Forest Hills envisioned no change if whites double in their neighborhoods.

Interestingly, although whites can be at the top of a racial hierarchy in Puerto Rico the majority of the responses were no change, and few responses were increase. This might suggest that other variables, such as income, are
influencing housing values. Nationality might be another variable to take into consideration.

![Bar Chart](image)

Figure 40. Results for Blacks and Housing Value

Similar responses were given when the same question was addressed regarding a doubling of the black population. The town of Loíza is the only municipio in Puerto Rico in which the percentage of blacks is higher than whites. The majority of the participants in each community perceived *no change* if blacks doubled in their neighborhoods as shows Figure 40. In Los Angeles more than four fifths (83.6%) of the participants answered *no change*. In Santa Rita little more than three quarters envisioned “no change” in the housing values if blacks double in their neighborhood. 83.6 percent of the participants in Roosevelt
perceived *no change*. Finally, the majority of the participants (98.5%) in Ext. Forest Hills perceived *no change* if blacks doubled in their neighborhoods. For the majority of the participants in all neighborhoods, the most common answer was *no change* in housing values if Blacks doubled in their neighborhoods.

Similar to the answers for whites, the majority of the responses indicated *no change* although few people answered *decrease*. Although blacks might be placed at the bottom of the racial hierarchy the majority of the respondents indicated *no change*. This trend might be perceived as an expression of nationality in which Puerto Rican becomes the most important description, and secondary to it is skin color.

The participants were also asked “If Cubans doubled in your neighborhood, what do you think will be the effect on the property value?” (Figure 41). The most common answer was *no change* in Los Angeles, Santa Rita, and Ext. Forest Hills with 82.1%, 80.3%, 82.1%, and 90.0% respectively. It is interesting to note that, as in the case for whites, few participants perceived a positive impact on property values if Cubans doubled in their neighborhoods.

The majority of the responses were *no change* although few respondents perceived an *increase* and a few others perceived a *decrease*. In this case, it may be that Cubans are being seen as U.S. citizens and not in terms of their nationality. However, neither their minority status nor their condition as being immigrants has placed them in a vulnerable position. In any case, it is likely that Cubans are
being perceived as whites and many of them enjoy a high socio-economic status which might help to explain the pattern of the responses.

![Figure 41. Results for Cubans and Housing Value](image)

The last question about national/ethnic origin vis-à-vis housing value addressed the Dominican population: *If Dominicans doubled in your neighborhood, what do you think will be the effect on the property value?* Here, the responses followed a strong pattern in all of the four surveyed areas (Figure 42). The majority of the participants across all surveyed neighborhoods perceived a decrease in property value if Dominicans doubled in their neighborhood. Los Angeles neighborhood registered a 50.7% of answers in which the participants
envisioned that housing values could *decrease* while a 47.8% perceived *no change*. Los Angeles neighborhood has a Dominican population of over 10%. In Santa Rita, an area with a high population of college students and Dominican population, the respondents also tended to answer, *decrease* (56.1%) while 43.9% expected *no change*. In the neighborhood of Roosevelt, 59.7% of the participants perceived that housing values might *decrease* if the Dominican population doubled while 40.3% perceived *no change*. In Ext. Forest Hills neighborhood almost three quarters (74.2%) of the participants perceived Dominicans would have an adverse effect on housing values and could trigger a *decrease* while just a little more than a quarter (25.8%) of the participants perceived *no change* in their housing value. The neighborhoods of Roosevelt and Ext. Forest Hills have a Dominican population smaller than 5 percent.

The responses for Dominicans greatly contrasts with the responses for whites, blacks, and Cubans. The majority of the responses were *decrease*. First, Dominicans are considered to be black in Puerto Rico. Second, they are a vulnerable population due to their migratory status. In addition, they tend to occupy the jobs that nobody else wants. These reasons might be tied to the respondents’ explanations for their answers, such as “many Dominicans living in the same housing unit” which make sense if we take into consideration that they occupy the less desirable and low wage jobs. Below I analyze the most common explanations from the survey.
Pattern of Responses

Following the survey, there is little doubt regarding the trends in the responses concerning the Dominican population vis-à-vis housing values. However, it is necessary to obtain a deeper profile of the participants beyond their neighborhood of residence. This section provides a broader view of those who responded to the survey by cross tabulating their responses with their national/ethnic origin, socio-economic status and their academic education.
Responses according to the national/ethnic origin

The last question of the survey involved the perception of different national/ethnic groups related to housing values. The first of these national/ethnic groups were whites. Table 6 shows how each national/ethnic group responded to the specific question that relates whites and housing value.

Table 6. Whites vis-à-vis Housing Values by National/Ethnic Origin

<table>
<thead>
<tr>
<th>National/Ethnic Origin</th>
<th>Increase</th>
<th>No Change</th>
<th>Decrease</th>
<th>I do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puerto Rican</td>
<td>17</td>
<td>208</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Dominican</td>
<td>3</td>
<td>14</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 7 shows a similar trend of Table 7 in which the majority of participants responded No change to the question relating blacks and housing values. There were 28 out of 260 participants who responded Decrease. No change was the most common answer for all national/ethnic groups.

Table 7. Blacks vis-à-vis Housing Values by National/Ethnic Origin

<table>
<thead>
<tr>
<th>National/Ethnic Origin</th>
<th>Increase</th>
<th>No Change</th>
<th>Decrease</th>
<th>I do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puerto Rican</td>
<td>4</td>
<td>199</td>
<td>24</td>
<td>3</td>
</tr>
<tr>
<td>Dominican</td>
<td>1</td>
<td>14</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 8 shows the responses for the following question: *If Cubans doubled in your neighborhood, what do you think will be the effect on the property value?* The majority of each national/ethnic group responses were *No change*. The second most common answer for Puerto Ricans was *Decrease* while the minority of the Puerto Ricans participants perceived that if Cubans doubled it might *Increase* the property value. The majority of the Dominicans perceive *No change* if Cubans doubled in their neighborhood.

<table>
<thead>
<tr>
<th>National/Ethnic Origin</th>
<th>Increase</th>
<th>No Change</th>
<th>Decrease</th>
<th>I do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puerto Rican</td>
<td>14</td>
<td>193</td>
<td>23</td>
<td>0</td>
</tr>
<tr>
<td>Dominican</td>
<td>1</td>
<td>15</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 9 shows the answers by national/ethnic group for the following questions: *If Dominicans doubled in your neighborhood, what do you think will be the effect on the property value?* The biggest national/ethnic group responding the survey is Puerto Rican. Almost 37 percent of the Puerto Ricans answered *No change* while the majority (over 63 percent) perceived that housing values might *Decrease* if Dominicans doubled in their neighborhood. The majority of the Dominicans respondents perceived *No change* if Dominicans doubled in their neighborhood although the second most common answer from the Dominicans
interviewed was *Decrease* and just one of them answered that the property value would *Increase*.

<table>
<thead>
<tr>
<th>National/Ethnic Origin</th>
<th>Increase</th>
<th>No Change</th>
<th>Decrease</th>
<th>I do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puerto Rican</td>
<td>0</td>
<td>85</td>
<td>145</td>
<td>0</td>
</tr>
<tr>
<td>Dominican</td>
<td>1</td>
<td>11</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

*Table 9. Dominicans vis-à-vis Housing Values by National/Ethnic Origin*

If Cubans doubled in your neighborhood, what do you think will be the effect on the property value?

Responses according to the socio-economic status

In addition to examining the responses according to the national/ethnic group, responses were cross tabulated by socio-economic status to determine whether or not specific patterns appeared. Tables 10 through 13 present four categories of socio-economic status plus a category called *private* which corresponds to those who did not want to disclose this information. The four categories used in the survey to represent the socio-economic status are *Less than $10,000, $10,001 - $24,999, $25,000 - $50,000, and More than $50,000.*

Table 10 shows the answers by socio-economic status for the question *If whites doubled in your neighborhood, what do you think will be the effect on the property value?* Table 10 presents the bulk of the answers as *No change* for each one of the socio-economic groups. There were just two participants, one participant from the socio-economic group of *Less than $10,000* and one participant from the socio-
economic group of $10,000 - $24,999, who perceive that their housing value might *Decrease*. There were few participants for each group who perceive an *Increase* in their property value if whites doubled in their neighborhoods.

Table 10. Whites vis-à-vis Housing Values by Socio-Economic Status

<table>
<thead>
<tr>
<th>Socio-Economic Status</th>
<th>Increase</th>
<th>No Change</th>
<th>Decrease</th>
<th>I do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>2</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Less than $10,000</td>
<td>11</td>
<td>90</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>$10,000 - $24,999</td>
<td>4</td>
<td>66</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>$25,000- $50,000</td>
<td>3</td>
<td>56</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>More than $50,000</td>
<td>3</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 11 shows that the majority of each socio-economic group answered *No change* for the question *If blacks doubled in your neighborhood, what do you think will be the effect on the property value?* However, unlike Table 11, there were 14 out of 102 participants in the socio-economic group *Less than $10,000* who perceive a *Decrease* in their property value. There were 8 out of 75 participants that belong to the socio-economic group *$10,000 - $24,999* who perceive a *Decrease*. In addition, four participants from the socio-economic groups *$25,000 - $50,000* and two participants from the socio-economic group *More than $50,000* perceived that property values can *Decrease*. There were just 5 participants who perceive an
Increase, one respondent from the socio-economic group Private and four from Less than $10,000.

Table 11. Blacks vis-à-vis Housing Values by Socio-Economic Status

<table>
<thead>
<tr>
<th>Socio-Economic Status</th>
<th>Increase</th>
<th>No Change</th>
<th>Decrease</th>
<th>I do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>1</td>
<td>11</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Less than $10,000</td>
<td>4</td>
<td>84</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>$10,000 - $24,999</td>
<td>0</td>
<td>63</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>$25,000 - $50,000</td>
<td>0</td>
<td>55</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>More than $50,000</td>
<td>0</td>
<td>9</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 12 presents the responses by socio-economic status concerning Cubans vis-à-vis housing values. Again, the majority of the participants for each socio-economic group perceived No change, If Cubans doubled in your neighborhood, what do you think will be the effect on the property value? A minority of participants for all socio-economic groups perceived an Increase in the property value; two from the group Private, four from Less than $10,000, four from $10,000 - $24,999, six from $25,000 - $50,000, and two from the socio-economic group More than $50,000. On the other hand, various participants perceived an Increase: one from the group Private, eleven from the group Less than $10,000, six from $10,000 - $24,999 as well as $25,000 - $50,000, and just one participant from the group More than $50,000.
Table 12. Cubans vis-à-vis Housing Values by Socio-Economic Status

<table>
<thead>
<tr>
<th>Socio-Economic Status</th>
<th>Increase</th>
<th>No Change</th>
<th>Decrease</th>
<th>I do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>2</td>
<td>9</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Less than $10,000</td>
<td>4</td>
<td>87</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>$10,000 - $24,999</td>
<td>4</td>
<td>65</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>$25,000 - $50,000</td>
<td>6</td>
<td>48</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>More than $50,000</td>
<td>2</td>
<td>8</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 13 presents the results by socio-economic status for the survey’s question *If Dominicans doubled in your neighborhood, what do you think will be the effect on the property value?* The majority of all socio-economic groups, except *Private*, perceived a *Decrease* in the property value. The socio-economic group *Private* is composed of 12 participants in which one of them perceived an *Increase*, the majority (seven) perceived *No change*, while four perceive a *Decrease* in their property values.

Table 13. Dominicans vis-à-vis Housing Values by Socio-Economic Status

<table>
<thead>
<tr>
<th>Socio-Economic Status</th>
<th>Increase</th>
<th>No Change</th>
<th>Decrease</th>
<th>I do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>1</td>
<td>7</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Less than $10,000</td>
<td>0</td>
<td>39</td>
<td>63</td>
<td>0</td>
</tr>
<tr>
<td>$10,000 - $24,999</td>
<td>0</td>
<td>32</td>
<td>43</td>
<td>0</td>
</tr>
<tr>
<td>$25,000 - $50,000</td>
<td>0</td>
<td>19</td>
<td>41</td>
<td>0</td>
</tr>
<tr>
<td>More than $50,000</td>
<td>0</td>
<td>4</td>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>
Responses according to the participants’ formal education

The last of the participants’ characteristics to be cross tabulated with national/ethnic origin vis-à-vis housing value is formal education. There are five groups: Private, Less than High School, High School, Associate Degree, Bachelor Degree, and More than Bachelor Degree. Tables 14, 15, 16, and 17 present the results for whites, blacks, Cubans, and Dominicans, respectively. Table 15 shows that the bulk of each group of education perceived No change for the following question: If whites doubled in your neighborhood, what do you think will be the effect on the property value?

<table>
<thead>
<tr>
<th>Formal Education</th>
<th>Increase</th>
<th>No Change</th>
<th>Decrease</th>
<th>I do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>2</td>
<td>9</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Less than High School</td>
<td>2</td>
<td>12</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High School</td>
<td>8</td>
<td>89</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Associate Degree</td>
<td>2</td>
<td>49</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bachelor Degree</td>
<td>3</td>
<td>60</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>More than Bachelor Degree</td>
<td>6</td>
<td>11</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 15 shows the results for the following question: If blacks doubled in your neighborhood, what do you think will be the effect on the property value? Similar to Table 14, the majority of the respondents for each group perceived No change. Although there are various persons who perceived a Decrease in their property
value the amount is minuscule. The 13 percent of the participant in the group High School perceived a Decrease in their property values.

Table 15. Black vis-à-vis Housing Values by Formal Education

<table>
<thead>
<tr>
<th>Formal Education</th>
<th>Increase</th>
<th>No Change</th>
<th>Decrease</th>
<th>I do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>2</td>
<td>9</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Less than High School</td>
<td>0</td>
<td>11</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>High School</td>
<td>1</td>
<td>85</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Associate Degree</td>
<td>1</td>
<td>48</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Bachelor Degree</td>
<td>0</td>
<td>56</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>More than Bachelor Degree</td>
<td>1</td>
<td>13</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 16 presents the results for the following question: If Cubans doubled in your neighborhood, what do you think will be the effect on the property value? Again, the bulk of the responses were No change. Table 16, likewise Table 15, present a reduced eleven percent of participants from the group High School who perceived a possible Decrease in their property value.
Table 16. Cubans vis-à-vis Housing Values by Formal Education

<table>
<thead>
<tr>
<th>Formal Education</th>
<th>Increase</th>
<th>No Change</th>
<th>Decrease</th>
<th>I do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>4</td>
<td>8</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Less than High School</td>
<td>1</td>
<td>10</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>High School</td>
<td>1</td>
<td>88</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Associate Degree</td>
<td>2</td>
<td>47</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Bachelor Degree</td>
<td>5</td>
<td>54</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>More than Bachelor Degree</td>
<td>5</td>
<td>10</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Finally, Table 17 shows the results for the following question: *If Dominicans doubled in your neighborhood, what do you think will be the effect on the property value?* Over 40 percent of the participants that belong to the *Private* group perceived *No Change*. Close to 30 percent of the participants with formal education less than *High School* perceived *No change* while 45 percent of the participants with a *High School* diploma perceived *No change*. Almost 40 percent of the participants with an *Associate Degree* perceived *No change* while 32 percent of the participants with a *Bachelor Degree* perceive *No change* as well. Almost 30 percent of the participant with *More than Bachelor Degree* perceived *No change*. However, as shown in Table 8.12, the majority of the participants for each group perceived that property value might *Decrease* if Dominicans doubled in their neighborhood.
Table 17. Dominicans vis-à-vis Housing Values by Formal Education

If Dominicans doubled in your neighborhood, what do you think will be the effect on the property value?

<table>
<thead>
<tr>
<th>Formal Education</th>
<th>Increase</th>
<th>No Change</th>
<th>Decrease</th>
<th>I do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>1</td>
<td>6</td>
<td>7</td>
<td>0</td>
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<tr>
<td>Less than High School</td>
<td>0</td>
<td>4</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>High School</td>
<td>0</td>
<td>45</td>
<td>55</td>
<td>0</td>
</tr>
<tr>
<td>Associate Degree</td>
<td>0</td>
<td>20</td>
<td>31</td>
<td>0</td>
</tr>
<tr>
<td>Bachelor Degree</td>
<td>0</td>
<td>21</td>
<td>43</td>
<td>0</td>
</tr>
<tr>
<td>More than Bachelor Degree</td>
<td>0</td>
<td>5</td>
<td>12</td>
<td>0</td>
</tr>
</tbody>
</table>

Analysis and Interpretation of the Survey

The purpose of the survey was to make an assessment of the perception of minority groups toward housing values from a micro-scale perspective, which can provide a foundation or context for the analysis. The statistical analysis evaluates characteristics that might impact housing values from a macro-level perspective while the survey reviews them at a micro-level. The survey used neighborhood characteristic variables, made use of various well-known neighborhoods as reference areas, and collected participants’ perceptions for analysis.

This section presents the most relevant questions included in the survey. The survey reveals interesting findings and a spatial context regarding the perceptions of impacts of minorities on housing values. For instance, the first question exposes a clear dichotomy between neighborhoods and establishes a
hierarchy of neighborhoods that might positively or negatively influence housing values. The neighborhoods of Old San Juan and Torrimar showed a high incidence of a positive relationship in housing value. In fact, these neighborhoods hold contrasting peculiarities. On the one hand, Old San Juan and Torrimar are upscale neighborhoods. In addition, Old San Juan is a historic district. In both the Old San Juan and Torrimar neighborhoods the percentage of Blacks or Dominicans is almost zero. On the other hand, the neighborhoods of Loíza and Villa Palmera have a greater percentage of minority residents. Loíza’s Black population is over the fifty percent while Villa Palmera has the most noticeable concentration of Dominicans in Puerto Rico. In addition, both Loíza and Villa Palmera are low-income areas. The first question’s responses were as expected. The dichotomy between affluent and poor, between the majority and minority groups’ neighborhoods showed up immediately.

Moreover, in the subsequent questions there was a continuous dichotomy referring to the neighborhood characteristics of the more affluent (Old San Juan and Torrimar) and the less affluent (Loíza and Villa Palmera) neighborhoods. Finally, all the participants in the surveyed neighborhoods (Los Angeles, Santa Rita, Roosevelt and Ext. Forest Hills) self-categorized their respective neighborhoods as the ones between these dichotomies. One prominent example is the question that asked to rank from one to five, with five as the maximum, the level of education in the neighborhood (Appendix I). All participants in the
surveyed areas categorized their neighborhoods a 3 while Old San Juan, Torrimar, Loíza, and Villa Palmera received 4, 5, 2, and 1 respectively.

The most interesting results are illustrated in the responses from the last question on the survey. The last question asked the participants to evaluate the effects on housing values if an ethnic group (Cuban, Dominican, Afro-Puerto Rican or Black, and White) doubled in their neighborhood. Among all the groups, Dominicans were the only ethnic group with a conspicuous negative response. Figure 43 shows the four surveyed neighborhoods with their respective answers, including the neighborhoods in which the Dominican population is greater than 10 percent and showing different distribution according to its population.

In short, the responses of the last survey question seems to be the most revealing, suggesting a relationship of distance and perception of decreasing property values if the Dominican population doubles. For instance, the neighborhoods of Los Angeles and Santa Rita share one commonality: large percentages of Dominican population. In Los Angeles the Dominican population is 11.52 percent while in Santa Rita makes up a 13.44 percent.
Figure 43. Surveyed Neighborhoods and Dominican Population

Surveyed Areas and Dominican Population

Dominicans
Percent
- 10.50 - 20.00
- 20.01 - 30.00
- 30.01 - 38.90

Legend:
- Municipio
- Surveyed Areas

Maps show the distribution of Dominicans across surveyed areas, with a color scale indicating the percentage range of Dominicans in each area.

Bar charts below the map provide a breakdown of Decrease, No change, and Increase in the Dominican population for specific neighborhoods:
- Ext. Forest Hills
- Roosevelt
- Santa Rita
- Los Angeles

The maps and bar charts together illustrate the concentration and change in Dominican population across the surveyed neighborhoods.
However, there are two differences between Los Angeles and Santa Rita neighborhood: 1) Santa Rita is surrounded by other neighborhoods with the same or higher Dominican population percentage, while the Los Angeles neighborhood is not close to neighborhoods in which Dominican levels are high and 2) many residents in Santa Rita return on the weekends to their parents’ houses. In other words, they are not permanent residents and their perceptions regarding the Dominican population might also be shaped by their parents’ neighborhoods’ context.

The two census tracts that contain the Roosevelt community have a Dominican population of 2.69 and 2.55 percent. However, Roosevelt is surrounded by various neighborhoods that reach from ten to twenty percent of the Dominican population. The same is the case for Ext. Forest Hills in which the Dominican population reaches 1.99 percent in one of the census tracts and 4.99 percent in the other. There is an area nearby Ext. Forest Hills that residents identify as a Dominican neighborhood. However, according to the 2000 Census, the Dominican population reaches only 13.65 percent in that neighborhood.

Duany (1990) perceived “areas with 11 to 20 percent of foreign population as a medium concentration and an area of more than 20 percent of foreign population as high concentration” (p. 22). However, participants of Ext. Forest Hills neighborhoods perceived these areas of 11 to 20 percent as exclusively Dominican neighborhoods. The perception of various participants about the
amount of Dominicans in Los Angeles neighborhood is that there are “various Dominicans but this is not a Dominican neighborhood”. This suggests that a contrast exists between Los Angeles, which holds a medium concentration of the Dominican population (11 to 20 percent), and Ext. Forest Hills that holds less than a five percent Dominican population per census tract. These perceptions are noticed in the responses across the neighborhoods, especially Ext. Forest Hills and Los Angeles. Therefore, the results suggest an association of distance from Dominican neighborhoods and the participants’ perceptions about the relationship between Dominicans and housing values.

Today, there are more areas in which the Dominican population is more conspicuous. Dominican migration has continued to other neighborhoods in Puerto Rico. Nevertheless, professional appraisals of housing values cannot include these social variables in their estimates because they would be penalized as unethical practices. Still, perceptual problems exist.

Duany argued that “the continuous migration of Dominicans to Puerto Rico has resulted in a particular perception which associates the immigrants with crime, a decrease in salaries, and abuse of public services” (Duany, 1990, p. 19). Yet, this study suggests that participants’ perception of Dominicans and lower housing values differs according to the distance of the participants from Dominican-prevalent communities. In other words, the greater the distance the stronger the tendency to perceive that Dominicans are linked to a decrease in
housing values. In fact, scholars have pointed out this phenomenon of perception and distance. For instance, Golledge and Stimson (1997) explain that location is an important factor that affects awareness.

Finally, the participants’ perceptions suggest a negative relationship of Dominicans vis-à-vis housing values similar to the global results (Table 4). However, the survey responses for percent of Black population (Figure 40) contrast with the global results (Table 4). Just a small amount of participants responded that housing values would decrease if Blacks doubled in their neighborhood.

In addition, the survey covers one more aspect that statistical analyses cannot incorporate. The survey gave respondents an opportunity to answer the open-ended question “why do you think this phenomenon (of minority groups affecting the housing value) occurs?” Interestingly, many of the respondents tended to disassociate from the question and “spoke” for the community and not from a personal perspective. Therefore, it is important to consider the way in which people answered the question. It was common for many people answering the survey to respond it in this way, “well, I do not think that Dominicans diminish the housing value but other people think so because of discrimination”.

There were 228 out of 266 participants who perceived that Dominicans diminish housing values, of which 28.9% of them also believe that is due to
cultural differences. The second most common answer (14.9%) of the participants’ perception was attributed to discrimination.

A more curious answer was given by 12.3% of the participants who perceived that the Dominican population, if doubled, could diminish housing values. They explained that this phenomenon occurs but the impact depends on the level of education. However, this is interesting because some participants provided this explanation after they answered that the Dominican population, if doubled, would diminish housing values. For example, there were other participants who answered no change and later explained that depending the level of education or depending on the person. Another common explanation, offered by 11.8% of the participants, was noise. They perceived that the Dominican population, if doubled, could diminish housing values because they (Dominicans) are noisy people. These were the four most common answers given by the 228 participants who perceived that Dominican could diminish housing values.

There were almost thirty different responses such as because they rent the property instead of owning, they are illegal, they do not follow laws, there are too many Dominicans living in a single housing unit, cultural differences and too many cars in the street. However, some of these answers seem unlikely in some of the surveyed neighborhoods. A participant in the neighborhood of Ext. Forest Hills responded “Dominicans always have their cars in the street and they are loud.”
Still, the fieldwork combined with personal in depth knowledge of the area did not reveal Dominicans in that section of the street. In fact, the many cars in the street were from their Puerto Rican neighbors. Another answer used was that Dominicans are drug-dealers. This was the reasoning of one participant in Los Angeles neighborhood who possesses a Master degree in Theology, a Bachelor’s degree in Education, and is retired. In the same neighborhood of Los Angeles, a Dominican respondent answered that if Dominicans double the housing values decrease because of discrimination. This person, who is married to a Puerto Rican, compared the discrimination against Dominicans living in Puerto Rico with that of Haitians living in the Dominican Republic.

Various participants in the Roosevelt neighborhood gave totally different responses regarding decreasing housing values. An occasional answer was addressed against the commercial establishments (Figure 18). One participant explained that commerce brings more crime, noise, and traffic to the residential area. Various other participants in the neighborhood agree with this reasoning. Roosevelt is a community which is dissected by various major avenues, also surrounded by main avenues, and close to the central business district.

Among all the answers there were various dealing with the space such as Dominicans leave their cars in the street, there are many Dominicans living in a single housing unit, and there are many people (Dominicans) in a small space (neighborhood). An elderly participant in the neighborhood of Santa Rita gave the last of these
answers. The old lady, in her 80s, has been living in the area since her marriage in her 20s and has witnessed the neighborhood’s transformations. The small space makes reference to the increase of population density of Santa Rita but also makes reference to the island of Puerto Rico hosting Dominicans.

The survey shows the importance of the neighborhoods’ context and the relationships of different variables that might impact median housing values across the study area. The survey reveals the qualitative aspects of the reasons for each neighborhood’s participants’ perceptions of minority groups, among other neighborhood characteristics, vis-à-vis housing values. However, more importantly, the survey in conjunction with the GWR analysis shows the significance of local variation as well as the necessity to re-examine regional studies that did address local relationships. Results from such studies can be misleading due to the dependence of a single regression model for the entire study area.

Summary

The main statistical tools used in this dissertation were scatter plot, Gi*, OLS, and GWR (Chapter 7), and a survey (Chapter 8). Both the quantitative and qualitative results suggest an association between median housing values and one of the foreign national groups. Specifically, Dominicans (Table 16 and Figure 32) are identified by the OLS regression as a negative factor associated
with median housing values. GWR indicates Percentage of Blacks as a non-stationary effect or its influence on the median housing value varies from one place to another.

In addition, the survey method shows the same tendency among the participants of the four selected neighborhoods in the study area. However, although the various analyses suggest a negative association between housing values and the Dominican population, the models do not explain the reason why this phenomenon occurs. Nevertheless, the survey does not capture the nuances of race in Puerto Rico, but rather provides a deeper understanding of the quantitative analysis. The survey can examine participants’ perceptions about general associations dealing with nationality and, to a lesser degree, about a binary category of race (white and black).

The survey resulted in a reliable instrument to provide context and understanding for the quantitative analysis. First, the OLS model suggests that Dominicans negatively influence the median housing values. However, the GWR reveals areas that are not significant, two regions in which Dominicans negatively influence the median housing value, and one area in which Dominicans positively influence the median housing value. Therefore, the GWR uncovered spatial variations. However, it is the survey instrument that provided understanding to the quantitative analysis because it uncovered patterns of responses.
The survey showed that a constant response emerged in which the participants perceive negatively the presence of Dominicans for housing values. However, this is not the same for blacks. In this way, Dominican cannot be an euphemism for black. Furthermore, as mention earlier, Puerto Ricans tend to identify themselves as Puerto Ricans to distinguish themselves from another nationalities. Yet, Puerto Ricans are conscious of the racial dynamics in Puerto Rico.

It is interesting to notice how the survey was able to capture the exceptionality of Loíza as an area that might depress housing values opposite to the participants perceptions about blacks of “no change” in the housing values. Therefore, these answers reinforce the concept of spatiality and exceptionality across space.

Although the survey presents the response by education, nationality, and income among others, a better instrument is needed to capture details on how the participants perceived the relationship between nationality and race or income. However, various scholars have discussed this issue. For instance, in some research participants have perceived Dominicans as black and poor, while Cubans were perceived as white and wealthy (see Duany, 2002 and 2006 and Grosfoguel, 2003. In any case, the survey was intended to provide context and understanding for the quantitative analysis.
Chapter 9

Conclusion

This dissertation fills a void in the body of research that addresses the relationship between minority groups and median housing values by focusing on the majority’s perception of minority groups vis-à-vis housing values within a Hispanic Caribbean context. The inclusion of the majority’s perception of minority groups vis-à-vis housing values adds depth to the statistical analysis. The participants’ responses not only reinforce the statistical analysis (and vice versa), but also uncover potential reasons for this phenomenon.

The first part of this dissertation was based on a series of exploratory data analyses, both univariate and multivariate. The univariate analysis explored the spatial pattern of hot and cold spots of racial/ethnic variables. The multivariate analysis included both global and local regression models that included neighborhoods’ characteristic. The regression models addressed the influence of various neighborhoods characteristics on housing values in a way that can estimate, or predict, the median housing values for a neighborhood based on a set of neighborhoods characteristics. The use of a Geographically Weighted Regression (GWR) incorporates local spatial relationships or exceptions that might occur across the study area and points out the importance of context. In
addition, the GWR helps to identify variations across space and therefore neighborhood effects that influence housing value. The incorporation of neighborhood characteristics and the inclusion of GWR expand the accuracy and comprehension of information on neighborhoods characteristics and housing values. This dissertation elaborated on the research of neighborhoods effects in housing values due to its important focus on socio-economic outcomes.

The second part of the dissertation was a survey administered in four neighborhoods within the study area in order to capture attitudes and perceptions about minorities vis-à-vis housing values. The participants’ perceptions show the importance of context and the responses variations across space. The context deals with perception and attitudes towards four main groups: whites (Puerto Ricans), blacks (Puerto Ricans), Cubans, and Dominicans. Therefore, it is important to understand how racial dynamics in the island might influence the participants’ perceptions.

The dissertation analyses identified the residential patterns of Blacks, Cubans, and Dominicans residents across the study area. The analysis suggests that the ethnic variables influence housing values. According to the global regression analysis (Table 4) the percentage of Dominicans demonstrated a negative association with median housing values. In addition, the GWR analysis suggests that the variable percentage of blacks is non-stationary which indicates that its effects on housing values vary across space. GWR improves the OLS analysis
which is unable to identify spatial exceptions. This research confirms the contention that attitudes and perceptions seem to play a role in shaping housing values in Puerto Rico.

The most important contribution of this dissertation was the qualitative data collection in four neighborhoods across the study area. The survey collected data related to the attitudes and perceptions of the participants. These data tended to parallel the results of the regression analyses. On the one hand, the participants in the four surveyed neighborhoods perceived that the doubling of the Dominican population in their neighborhoods might have an adverse effect (decrease) on their housing values (Figure 42). On the other hand, the majority of the participants’ responses for Blacks, Cubans, and Whites indicated that no changes were perceived if these populations doubled in their neighborhoods while participants’ responses for Dominican indicated decrease if this population doubled in their neighborhoods. It is possible to argue that this occurs due to an existent racial hierarchy in Puerto Rico in which Dominicans are seen as black and illegal immigrants situating them in the bottom of this hierarchy.

In addition, the results showed that there seems to be a tendency of perception to be based on spatial context and distance. There is a tendency in which an increase in distance from the Dominican community is linked to increases in the participants’ negative responses. The survey was also able to capture the participant’s reasons given for their responses. The responses helped
to interpret the positive or negative associations identified in the regression analyses.

Further research on this topic is necessary. The findings of this dissertation are just the first step of a longitudinal project. It is necessary to examine changes in median housing values in other spatial contexts, including urban, and perhaps in rural, areas according to their neighborhood characteristics through time. A longer time period is necessary due to the dynamic changes of urban areas and the transformation of rural to urban or suburban areas. In addition, this research was dependent on census data, which is currently available only every ten years, in order to examine the effects of neighborhood characteristics across time, especially racial and ethnic characteristics, on median housing values.

The dissertation results seem to suggest a relationship between distance and perceptions. On the one hand, Dominicans have been able to improve their economic situation by moving to other neighborhoods outside the Dominican community, noticeably to the Los Angeles neighborhood. On the other hand, Puerto Ricans tend to move out to other neighborhoods because they also improve their economic situation and because of demographic changes. At the same time, areas around the Dominican community in Santurce have been under renovation which increases the land value and therefore pushes the Dominicans to other areas. This creates a segregation pattern.
In the study area there are few neighborhoods that can be classified as segmented. A segmented neighborhood presents patterns of segregated residential areas. Precisely, that residential segregation pattern seems to reinforce the majority’s attitudes and perception of minority groups as shown on Figure 43. Following this pattern of residential segregation Puerto Ricans are moving out to new and more expensive neighborhoods in suburban areas. Thus, the old neighborhoods are being transformed for a variety of reasons such as age of the structure, income, and ethnicity.

For further research, it is possible to examine changes in the neighborhood of Santa Juanita in the city of Bayamón which had an increase in the Dominican population after the 2000 Census. Thus, many Puerto Ricans living in this area might be looking for other areas to move, leaving behind the newcomers. This process contributes to the segmentation of the housing market and the spatial divide that is a product of antagonism between the groups (Johnston et al., 2002, p. 212). Therefore, “segmentation is to be seen as a process of deteriorating inter-ethnic relations...[I]nsecurity and mistrust characterize relations at the local level...” (Boal, 1999: 590). Indeed, identifying characteristics occurring at the local level is one of the objectives of this study in which the use of GWR permitted the identification of interesting relationships. A new GWR analysis might point out interesting relationships and a survey can be administered in those areas identified.
This dissertation has also confronted various limitations. One factor limiting this study was the inability to gather ethnic data for Puerto Rico from the 1990 Census due to differences in the survey methodology between the mainland and the Commonwealth of Puerto Rico. This was the reason why it was only possible to perform a regression for the 2000 Census data. In addition, another limitation that is always present is the Modifiable Areal Unit Problem which results from the potential re-organization of the census tracts every 10 years (See Chapter 4). In any case, these problems could be minimized in two ways. One way to minimize the scale effect problem is using more detailed, smaller geographical units. In addition, the zoning or cross-area aggregation problem can be minimized through area-based spatial interpolation (Wang, 2006).

Although this study followed rigorous procedures it is possible to make improvements, such as including other metropolitan areas, instead of just part of one metropolitan area. Following up on the results regarding attitudes and perceptions in the metropolitan area (Figure 19) we could examine responses throughout the island. Moreover, these responses could be tied to spatial variations that might arise from differences in Dominican occupations.

The survey provided local context and helped in the interpretation of the results. However, the survey could include other ways to explore the issue of race relations in Puerto Rico. A further exploration might define the color in
which Puerto Ricans see different national groups and how this influences attitudes and perceptions.

The study of basic human needs, such as water, food, health or shelter as well as those related to social dynamics such as recreation, education and occupation, must be fundamental in the social sciences and for the development of societies. In doing so, societal improvements might reach levels comparable with those technological improvements related to armaments programs that offer nothing positive and very often results in the obliteration of all types of life. Therefore, academic efforts should be oriented to advancing society.
Appendix A: Human Subject Review Approval
KENT STATE UNIVERSITY
HUMAN SUBJECTS REVIEW BOARD

***
Notice to Investigator of
Initial Review of Project Application

Investigator’s Name(s) Jose Rafael Diaz Garcia
Project Title Maritayce, women varies in Puerto Rico: 1960-2000

***
Federal and University regulation require that all research involving human subjects be reviewed in advance by the full Human Subjects Review Board, except for specific categories of research which may be approved through an expedited procedure (Level I and Level II). Results of the initial screening of your project application are indicated below. If there are any questions, please contact your reviewer or the Division of Research and Graduate Studies, Auditorium Building, telephone 330-672-2704. Upon formal approval, a copy of the signature page of your application will be sent to you or your advisor, if you are a student.

LEVEL III Review:
Your project will be considered by the Human Subjects Review Board at its meeting on __________, starting at __________ in the Auditorium Building room 141. Following the meeting you will be notified of the Board’s action by Research and Graduate Studies.

___ Your attendance at this meeting is optional.
___ You are strongly urged to attend this meeting in order to answer any questions about your project. If you are a student, your faculty advisor is also invited to attend.

LEVEL II – Project will be examined by a second reviewer.
That reviewer is ___________________________ Tele. ___________________________
You may begin your project when notified by Research and Graduate Studies.

LEVEL I – Approved
You may begin your project immediately.

ADDITIONAL INFORMATION IS NEEDED BEFORE APPROVAL CAN BE GRANTED. (See comments)

COMMENTS:

Reviewed ______________________ Date ____________

Reviewer
Appendix B: Survey Questionnaire, English Version
Consent Form: Nativity, Origin, and Housing Values in Puerto Rico: 1990-2000

This is a research about the factors that may impact housing value in Puerto Rico. In this questionnaire are used socio-economy-demographic, physical environment, and accessibility characteristics of the neighborhood that can affect the housing value. This study is part of a dissertation research, which may be used for publication. I would like you to take part in this project.

If you decide to participate, you will be asked to answer some questions. The length of time will be around 10 to 15 minutes. Taking part in this project is entirely up to you, and no one will hold it against you if you decide not to do it. If you do take part, you may stop at any time.

To protect your confidentiality no name will be used in the questionnaire. The questionnaires will be save in the Department of Geography of Kent State University, Ohio, USA for a period no longer than 2 years and after that will be destroy.

If you want to know more about this research project, please call me at 330-672-3229 or Dr. Shawn Banasick at 330-672-5836. The project has been approved by Kent State University. If you have questions about Kent State University's rules for research, please call Dr. John L. West, Vice President and Dean, Division of Research and Graduate Studies (Tel. 330-672-2704).

You will get a copy of this consent form.

Sincerely,
José R. Díaz-Garayúa

I agree to take part in this project. I know what I will have to do and that I can stop at any time.

______________________________
Signature

______________________________
Date

Department of Geography
P.O. Box 5190 • Kent, Ohio 44242-0001
330-672-2045 • Fax: 330-672-4304 • E-mail: Geography@kent.edu
http://www.kent.edu/geography
Section I  Date ___/___/___ Area ____________ No._______

1. Sex ____  2. Age ____
3. Place of Birth ________________________________
4. How many children do you have? ______________
5. How many children are living with you? __________
6. How many persons live in your house? ____________
7. How many bedrooms have your house? ____________
8. How many persons in your family work full time? _____
9a. Income?  9b. Education
    ____ less than $10,000    ____ less than high school
    ____ $10,001 - $24,999   ____ high school
    ____ $25,000 - $50,000   ____ associate degree
    ____ more than $50,000   ____ bachelor degree
    ____ more than B.A.

10. Are you the owner of this housing unit?  yes  no
    If yes, please answer 10a. If no, please answer 10b.

10a. How much cost your property?  Type of subsidize? ______________

    $0 - $50,000    $150,001 - $250,000
    $50,001 - $75,000    $250,001 - $500,000
    $75,001 - $100,000    more than $500,000
    $100,001 - $150,000

    How did you know about this housing unit? __________________________

10b. How much do you pay for rent? Type of subsidize? ______________

    $0 - $200    $501 - $600
    $201 - $300    $601 - $750
    $301 - $400    $751 - $900
    $401 - $500    more than $900

    How did you know about this housing unit? __________________________
11. Where did you live before? City _______________ Country ________________

12. Why did you come here?
________________________________________________________________________

13. Are you thinking to move in the next 5 years? Yes _____ No _____

14. Where do you like to move?
________________________________________________________________________

Section II
1. If your property (housing unit) would be locate in the following res, what would be the effect on housing value?

<table>
<thead>
<tr>
<th></th>
<th>Increase</th>
<th>No change</th>
<th>Decrease</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loíza</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torrimar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Villa Plamera</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. What is your opinion about the roads in the following areas?

<table>
<thead>
<tr>
<th></th>
<th>Excellent</th>
<th>Good</th>
<th>Regular</th>
<th>Bad</th>
<th>Awful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old San Juan</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Loíza</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Torrimar</td>
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<td>Villa Plamera</td>
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</tr>
<tr>
<td>Your neighborhood</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. What is your opinion about the garbage service in the following area?

<table>
<thead>
<tr>
<th></th>
<th>Excellent</th>
<th>Good</th>
<th>Regular</th>
<th>Bad</th>
<th>Awful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old San Juan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loíza</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torrimar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Villa Plamera</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your neighborhood</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. What is your opinion about the security in the following areas?

<table>
<thead>
<tr>
<th></th>
<th>Excellent</th>
<th>Good</th>
<th>Regular</th>
<th>Bad</th>
<th>Awful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old San Juan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loíza</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Torrimar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Villa Plamera</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your neighborhood</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. What is your opinion about the schools’ quality in the following areas?

<table>
<thead>
<tr>
<th></th>
<th>Excellent</th>
<th>Good</th>
<th>Regular</th>
<th>Bad</th>
<th>Awful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old San Juan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loíza</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Torrimar</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Villa Plamera</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your neighborhood</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. What do you think is the amount of housing units for rent in the following areas?

<table>
<thead>
<tr>
<th></th>
<th>More than half</th>
<th>Around half</th>
<th>Less than half</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old San Juan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loíza</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torrimar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Villa Plamera</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your neighborhood</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Rank from 1 (lowest) to 5 (highest) the level of education of the following neighborhoods?

<table>
<thead>
<tr>
<th></th>
<th>Level of Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old San Juan</td>
<td></td>
</tr>
<tr>
<td>Loíza</td>
<td></td>
</tr>
<tr>
<td>Torrimar</td>
<td></td>
</tr>
<tr>
<td>Villa Palmera</td>
<td></td>
</tr>
<tr>
<td>Your Neighborhood</td>
<td></td>
</tr>
</tbody>
</table>
8a. If your housing unit would appraise in $100,000, what will be the effect in housing value according to the following characteristics?

<table>
<thead>
<tr>
<th>Increase</th>
<th>No change</th>
<th>Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than $15,000</td>
<td>$1 to $5,000</td>
<td></td>
</tr>
<tr>
<td>Good roads</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good garbage service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good security</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good schools’ quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Many housing units for rent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$1 to $5,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than $15,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8b. Do your children assist to public or private school?

9. What do you think would be the effect in the property value if a racial or national group double in your neighborhood?

<table>
<thead>
<tr>
<th></th>
<th>Increase</th>
<th>No Change</th>
<th>Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cubans</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominicans</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blacks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whites</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. Why this happens?

_______________________________________________________________________
_______________________________________________________________________
Appendix C: Survey Questionnaire, Spanish Version

Hoja de consentimiento: Lugar de origen y valor de la propiedad en Puerto Rico: 1990-2000

La presente investigación explora factores que pueden influir en el valor de la propiedad en Puerto Rico. El cuestionario comprende las siguientes áreas que influyen en el valor de la propiedad: demografía, características socio-económicas, entorno físico y accesibilidad. Este estudio es parte de una investigación doctoral, la cual puede ser usada para publicación. No obstante, su participación en este proyecto será completamente anónima.

El tiempo para completar este cuestionario es aproximadamente diez (10) minutos. Su participación es libre y voluntaria. Usted puede retirar su participación en cualquier momento.

Para proteger su confidencialidad no se le pedirá su nombre. Una vez se utilicen los datos del cuestionario, estos serán guardados en el Departamento de Geografía de Kent State University, Ohio, USA por un período no mayor de dos años. Los cuestionarios serán destruidos luego de este periodo de tiempo.

Si usted desea saber más sobre esta investigación puede comunicarse con el Dr. Banasick (330-672-5836) o con José Díaz (330-672-3229). El Departamento de Geografía y nuestras oficinas están localizadas en el edificio McGilvery en el campus de Kent State University. Esta investigación ha sido aprobada por Kent State University. Si usted tiene preguntas sobre los procedimientos de investigación favor de comunicarse con el Dr. John L. West, Vice-Presidente y Decano de la División de Investigación y Estudios Graduados (330-672-2704).

Si accede a participar recibirá una copia de la hoja de consentimiento.

Atentamente,
José Díaz

Deseo tomar parte en esta investigación. Compreno en qué consiste mi participación y reconozco que puedo retirarme en cualquier momento.

Firma

Fecha

Department of Geography
P.O. Box 5190 • Kent, Ohio 44242-0001
330-672-2045 • Fax: 330-672-4304 • E-mail: Geography@kent.edu
http://www.kent.edu/geography
Sección I

Fecha ___/___/___ Area __________________

No.________

1. Sexo ____  2. Edad ____
3. Lugar de nacimiento ______________________________
4. ¿Cuántos hijos tiene? ______________
5. ¿Cuántos hijos viven con usted? ______________
6. ¿Cuántas personas viven en su casa? ______________
7. ¿Cuántos dormitorios tiene su casa? ______________
8. ¿Cuántas personas en su familia trabajan a tiempo completo? ______
7a. Ingreso
   ____ less than $10,000
   ____ $10,001 - $24,999
   ____ $25,000 - $50,000
   ____ mas de $50,000
7b. Educación?
   ____ menos de escuela superior
   ____ escuela superior
   ____ grado asociado
   ____ bachillerato
   ____ mas de bachillerato

10. ¿Usted es el propietario/a de esta vivienda?  □ sí □ no
    Si contesta sí, pase a la pregunta 10a. Si contesta no pase a la pregunta 10b.

10a. Por cuánto compró su propiedad? Tipo de subsidio ______________

□ $0 - $50,000
□ $50,001 - $75,000
□ $75,001 - $100,000
□ $100,001 - $150,000
□ $150,001 - $250,000
□ $250,001 - $500,000
□ mas de $500,000

¿Cómo supo de esta vivienda? ______________________________

10b. ¿Cuánto paga de alquiler? Tipo de subsidio ______________

□ $0 - $200
□ $201 - $300
□ $301 - $400
□ $401 - $500
□ $501 - $600
□ $601 - $750
□ $751 - $900
□ mas de $900
¿Cómo supo de esta vivienda? _____________________________
11. ¿Dónde vivía anteriormente? Ciudad _________ País______________
12. ¿Por qué se mudó?
________________________________________________________________________

13. ¿Piensa mudarse en los próximos 5 años? Sí _____ No _____
14. ¿A qué lugar se mudaría?
________________________________________________________________________

Section II

1. Si su casa estuviera localizada en las siguientes áreas, ¿cuál sería el efecto en el valor de la propiedad?

<table>
<thead>
<tr>
<th></th>
<th>Incrementa</th>
<th>No cambia</th>
<th>Disminuye</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viejo San Juan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loíza</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torrimar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Villa Plamera</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. ¿Cuál es su opinión sobre las condiciones de las carreteras en las siguientes áreas?

<table>
<thead>
<tr>
<th></th>
<th>Excelentes</th>
<th>Buenas</th>
<th>Regular</th>
<th>Malas</th>
<th>Muy malas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viejo San Juan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loíza</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torrimar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Villa Plamera</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Su urbanización</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. ¿Cuál es su opinión sobre el servicio de recogido de basura en las siguientes áreas?

<table>
<thead>
<tr>
<th></th>
<th>Excelentes</th>
<th>Buenas</th>
<th>Regular</th>
<th>Malas</th>
<th>Muy malas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viejo San Juan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loíza</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torrimar</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Villa Plamera</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Su urbanización</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. ¿Cuál es su opinión sobre la seguridad en las siguientes áreas?

<table>
<thead>
<tr>
<th></th>
<th>Excelentes</th>
<th>Buenas</th>
<th>Regular</th>
<th>Malas</th>
<th>Muy malas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viejo San Juan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loíza</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torrimar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Villa Plamera</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Su urbanización</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. ¿Cuál es su opinión sobre la calidad de las escuelas en las siguientes áreas?

<table>
<thead>
<tr>
<th></th>
<th>Excelentes</th>
<th>Buenas</th>
<th>Regular</th>
<th>Malas</th>
<th>Muy malas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viejo San Juan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loíza</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torrimar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Villa Plamera</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Su urbanización</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. ¿Cuál cree usted es la cantidad de viviendas que se rentan en las siguientes áreas?

<table>
<thead>
<tr>
<th></th>
<th>Mas de la mitad</th>
<th>Cerca de la mitad</th>
<th>Menos de la mitad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viejo San Juan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loíza</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torrimar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Villa Plamera</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Su urbanización</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Organice del 1 (menor) al 5 (mayor) el nivel de educación en las siguientes áreas.

<table>
<thead>
<tr>
<th></th>
<th>Nivel de educación</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viejo San Juan</td>
<td></td>
</tr>
<tr>
<td>Loíza</td>
<td></td>
</tr>
<tr>
<td>Torrimar</td>
<td></td>
</tr>
<tr>
<td>Villa Plamera</td>
<td></td>
</tr>
<tr>
<td>Su urbanización</td>
<td></td>
</tr>
</tbody>
</table>
8a. Si su vivienda estuviese valorada en $100,000, ¿cuál sería el efecto en el valor de la propiedad de acuerdo a las siguientes características?

<table>
<thead>
<tr>
<th></th>
<th>Incrementa</th>
<th>No cambia</th>
<th>Disminuye</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mas de $15,000</td>
<td>$1 a $5,000</td>
<td>$1 a $5,000</td>
</tr>
<tr>
<td>Buenas calles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buen recogido de basura</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buena seguridad</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buena calidad en las escuelas públicas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muchas casas para la renta</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8b. ¿Sus hijos asisten a escuela pública o privada?

9. ¿Cuál cree usted sería el efecto en el valor de la propiedad si un grupo racial o nacional se duplica en su urbanización?

<table>
<thead>
<tr>
<th></th>
<th>Incrementa</th>
<th>No Cambia</th>
<th>Disminuye</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cubanos</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominicanos</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negros</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blancos</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. Por qué sucede esto?

_______________________________________________________________________
_______________________________________________________________________
Appendix D: Survey About Roads’ Condition

What is your opinion about the roads in Old San Juan?

<table>
<thead>
<tr>
<th>Neighborhoods</th>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles</td>
<td>11</td>
</tr>
<tr>
<td>Santa Rita</td>
<td>18</td>
</tr>
<tr>
<td>Roosevelt</td>
<td>12</td>
</tr>
<tr>
<td>Ext. Forest Hills</td>
<td>19</td>
</tr>
</tbody>
</table>

What is your opinion about the roads in Loíza?

<table>
<thead>
<tr>
<th>Neighborhoods</th>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles</td>
<td>10</td>
</tr>
<tr>
<td>Santa Rita</td>
<td>17</td>
</tr>
<tr>
<td>Roosevelt</td>
<td>10</td>
</tr>
<tr>
<td>Ext. Forest Hills</td>
<td>14</td>
</tr>
</tbody>
</table>

Legend:
- Excellent
- Good
- Average
- Bad
- Very Bad
- I do not know
What is your opinion about the roads in Torrimar?

What is your opinion about the roads in Villa Palmera?
What is your opinion about the roads in your neighborhood?

<table>
<thead>
<tr>
<th>Neighborhoods</th>
<th>Excellent</th>
<th>Good</th>
<th>Average</th>
<th>Bad</th>
<th>Very Bad</th>
<th>I do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles</td>
<td>23</td>
<td>20</td>
<td>18</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Santa Rita</td>
<td>26</td>
<td>26</td>
<td>17</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Roosevelt</td>
<td>25</td>
<td>25</td>
<td>20</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Ext. Forest Hills</td>
<td>24</td>
<td>24</td>
<td>20</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

Counts
Appendix E: Survey about Garbage Service

What is your opinion about the garbage service in Old San Juan?

What is your opinion about the garbage service in Loíza?
What is your opinion about the garbage service in Torrimar?

What is your opinion about the garbage service in Villa Palmeras?
What is your opinion about the garbage service in your neighborhood?
Appendix F: Survey about Security

What is your opinion about the security in Old San Juan?

What is your opinion about the security in Loíza?
What is your opinion about the security in Torrimar?

What is your opinion about the security in Villa Palmeras?
What is your opinion about the security in your neighborhood?

Counts

Neighborhoods

Los Angeles  Santa Rita  Roosevelt  Ext. Forest Hills

Counts

Excellent  Good  Average  Bad  Very Bad  I do not know
Appendix G: Survey about Schools’ Quality

What is your opinion about the schools' quality in Old San Juan?

What is your opinion about the schools' quality in Loíza?
What is your opinion about the schools’ quality in your neighborhood?

Counts

Los Angeles  Santa Rita  Roosevelt  Ext. Forest Hills

Excellent  Good  Average  Bad  Very Bad  I do not know
Appendix H: Survey about Rental Units

What is your opinion about the amount of housing units for rent in Old San Juan?

What is your opinion about the amount of housing units for rent in Loíza?
What is your opinion about the amount of housing units for rent in Torrimar?

What is your opinion about the amount of housing units for rent in Villa Palmeras?
What is your opinion about the amount of housing units for rent in your neighborhood?

Counts

Neighborhoods

More than half Around half Less than half I do not know
Appendix I: Survey about Education’s Ranking

In a scale from 1 to 5, lowest to highest, what do you think is the level of formal education of the following neighborhoods?

**Los Angeles' Participants' Responses**

<table>
<thead>
<tr>
<th>Neighborhoods</th>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old San Juan</td>
<td>5 (Highest)</td>
</tr>
<tr>
<td>Loiza</td>
<td>4 (High)</td>
</tr>
<tr>
<td>Torrimar</td>
<td>3 (Average)</td>
</tr>
<tr>
<td>Villa Palmera</td>
<td>2 (Low)</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>1 (Lowest)</td>
</tr>
<tr>
<td></td>
<td>I do not know</td>
</tr>
</tbody>
</table>

In a scale from 1 to 5, lowest to highest, what do you think is the level of formal education of the following neighborhoods?

**Santa Rita's Participants' Responses**

<table>
<thead>
<tr>
<th>Neighborhoods</th>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old San Juan</td>
<td>5 (Highest)</td>
</tr>
<tr>
<td>Loiza</td>
<td>4 (High)</td>
</tr>
<tr>
<td>Torrimar</td>
<td>3 (Average)</td>
</tr>
<tr>
<td>Villa Palmera</td>
<td>2 (Low)</td>
</tr>
<tr>
<td>Santa Rita</td>
<td>1 (Lowest)</td>
</tr>
<tr>
<td></td>
<td>I do not know</td>
</tr>
</tbody>
</table>
In a scale from 1 to 5, lowest to highest, what do you think is the level of formal education of the following neighborhoods?

**Roosevelt's Participants' Responses**

<table>
<thead>
<tr>
<th>Neighborhoods</th>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old San Juan</td>
<td>5 (Highest)</td>
</tr>
<tr>
<td>Loiza</td>
<td>4 (High)</td>
</tr>
<tr>
<td>Torrimar</td>
<td>3 (Average)</td>
</tr>
<tr>
<td>Villa Palmera</td>
<td>2 (Low)</td>
</tr>
<tr>
<td>Roosevelt</td>
<td>1 (Lowest)</td>
</tr>
</tbody>
</table>

**Ext. Forest Hills' Participants' Responses**

<table>
<thead>
<tr>
<th>Neighborhoods</th>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old San Juan</td>
<td>5 (Highest)</td>
</tr>
<tr>
<td>Loiza</td>
<td>4 (High)</td>
</tr>
<tr>
<td>Torrimar</td>
<td>3 (Average)</td>
</tr>
<tr>
<td>Villa Palmera</td>
<td>2 (Low)</td>
</tr>
<tr>
<td>Ext. Forest Hills</td>
<td>1 (Lowest)</td>
</tr>
</tbody>
</table>

Legend:
- □ 5 (Highest)
- □ 4 (High)
- □ 3 (Average)
- □ 2 (Low)
- □ 1 (Lowest)
- □ I do not know
Appendix J: Common about Housing Values in relation to Race/Ethnic

Most common answers of participants which relate decrease in housing value when Dominican double in their neighborhood

<table>
<thead>
<tr>
<th>Neighborhoods</th>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles</td>
<td>20</td>
</tr>
<tr>
<td>Santa Rita</td>
<td>15</td>
</tr>
<tr>
<td>Roosevelt</td>
<td>10</td>
</tr>
<tr>
<td>Ext. Forest Hills</td>
<td>5</td>
</tr>
</tbody>
</table>

- Cultural Differences
- Lack of Education
- Discrimination
- Loud
- Too many living in a single family unit
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