IMPACT OF RELOCATION ON QUALITY OF LIFE

A Dissertation

by

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ABSTRACT

The aim of this research was to explore the impact of a relocation project in the quality of life. The study was conducted in the state of Tabasco, Mexico and it considered a subjective and an objective approach. The study included relevant variables in three dimensions: social, economic and environmental.

Relocatees used to live on the riverbanks close to downtown and they were, voluntarily or involuntarily, relocated into two suburban areas far away from their original homes. This study was designed to compare the quality of life before and after being relocated and also to compare the objective and subjective quality of life approaches. Finally, the study made a quality of life distinction between both new localities. Data were collected through a survey that was carried out face to face with the relocatees.

It was found that the quality of life of the relocatees, either objectively or subjectively, decreased after being moved to the new sites. Although people who were relocated to the closest location to downtown showed a better quality of life than people from the other location. People who live closer to downtown rated better their subjective and objective conditions than the inhabitants of farthest neighborhood; however in both neighborhoods the perception of people about their quality of life was worse assessed than the objective indicators showed.

Any relocation process, whether voluntary or not, involve a change in the lifestyle of those affected. The extent to which this change affects quality of life will depend on how the relocation process is carried out and the degree of divergence between the former and current location.

It can be expected that relocatees improve their quality of life over time. This is a characteristic of adaptability and evolution of societies. Therefore, future research could determine if this phenomenon occurs or not in these two new locations.

DEDICATION

In memory of my late mother Chelito Garza,

To my father Jesus Cantú,

A special dedication to my wife Anita and my son Robert, without their support this goal

would never have been achieved.

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NOMENCLATURE

ABR   After Being Relocated

ABS   Affect Balance Scale

BBR   Before Being Relocated

CITI   Collaborative Institutional Training Initiative

GDP   Gross Domestic Product

HDI   Human Development Index

HWI   Human Wellbeing Index

IWI   International Wellbeing Index

KMO   Kaiser-Mayer-Olkin

LDC   Less Developed Countries

NHI   National Housing Inventory

NWI   National Wellbeing Index

OSL   Overall Satisfaction with Life

PCA   Principal Component Analysis

PWI   Personal Wellbeing Index

QoL   Quality of Life

WISP   Weighted Index of Social Progress

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1. INTRODUCTION

This research explores the impact of a relocation project over the quality of life[1] (QoL) of people relocated, who were moved from an urban area to a suburban area.

QoL has been studied from different points of view. Some conceptualize it from an economic perspective, while others focus directly on health or sociological issues. Still others relate it directly to the environment surrounding people. However, a comprehensive study of QoL depends on numerous variables, which can be measured in different ways and with different instruments. The literature, as presented herein, demonstrates that QoL encompasses two fundamental approaches that need to work together. On the one hand, the subjective approach concerns individual well-being. It notes that only an individual can state how good or bad is one's life, since what is good for one may not be good for others. On the other hand, there is an objective approach to QoL. It addresses features that affect the entire community such as road conditions, crime rate or distance to public facilities, or individual conditions, such as level of education, income and health. When one chooses to use a subjective or an objective approach or a mixture of both, there are many variables that correlate with QoL, for

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[1]In this research, the terms QoL, well-being and welfare are mentioned interchangeably, all referring to the same construct.

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instance: income, education, health, and pollution. Therefore, it is necessary to apply a multidisciplinary approach in estimating the welfare of people. This research will capture both subjective (people's perceptions) and objective conditions by applying a survey and observing the surroundings of two neighborhoods.

Further, relocation is an act that brings, to a greater or lesser extent, personal stress. When the relocation is voluntary, one would think the stress is less, since it is due to a search for better living conditions, though this may not necessarily happen. Nevertheless, relocation may not be voluntary; in this case the odds of achieving a better life greatly diminished because the individuals do not believe that the new place will meet their expectations or needs. In the latter case, the objective conditions of the new place could eventually counteract this misperception and the people could end up better off than before. However, this situation rarely occurs.

Relocation on a permanent or temporary basis has been one of the strategies adopted by authorities in the face of urban or landscape projects, and natural or human-caused disasters. The effect of relocation projects on populations is a global and longstanding issue, and it has been extensively studied (Badri, Asgary, Eftekhari, & Levy, 2006; Chang, 2010; Gibson, 1993; Hugo, 1996; Hwang, Cao, & Xi, 2010; Jourdan, 2008; Jourdan & Feinberg, 2010; Kinsey & Binswanger, 1993; Mileti & Paserini, 1996; Oliver-Smith, 1991; Xi & Hwang, 2011). Additionally, relocated people usually face economic and social challenges, both during and after moving, that affect their QoL (Badri et al., 2006). The poorest and elderly are typically more vulnerable populations,

as they often live in dangerous areas. Furthermore, job scarcity, rise in living costs, and lack of income are some of the most important economic difficulties faced by those people (French, Lee, & Anderson, 2010; Mileti & Paserini, 1996).

Nevertheless, while much research has been done in the relocation field, our knowledge of the complex two-way relationship involving relocation as both an impact and consequence in QoL remains limited. Moreover, how relocation and QoL concerns interact and impinge upon economic development, social change, and environmental issues is little understood. Therefore, this research seeks to analyze the QoL of people relocated using a survey and merging subjective and objective measures.

1.1. Statement of the problem

In October 2007, a major flood struck the state of Tabasco, Mexico, causing great economic losses for both the state and the population (SEGOB, 2008). This natural phenomenon affected nearly 62% (15,290 square kilometers) of the state's territory and 75% of its population (approximately 1.5 million people). The flood damaged a large number of houses, health centers, and educational facilities (SEGOB, 2008). The vast majority of the economic damage happened in the urban municipality of Centro.

The event ranks third in economic losses in the history of Mexico, with total losses amounting to 3.1 billion dollars. Historically, only the 1985 Mexico City earthquake and the cumulative effect of hurricanes Wilma and Stan in 2005 exceeded the damages and losses caused by the 2007 flood in Tabasco (SEGOB, 2008).

Due to the magnitude of the event, local authorities took the decision to permanently relocate the most affected people to safer suburban areas (S. Hernández, 2010). Thus, the relocatees would no longer experience floods, and the government would not need to rescue them again from an event like the one in 2007. Under this premise, the people relocated would enjoy greater well-being in the new location. From this perspective, a concern has arisen about whether the intentions of the authorities have been met or not, because isolated conversations with locals and newspaper notes suggest that the relocatees are not pleased with their current living conditions. To further investigate these disagreements, relocatees were asked about their opinion of their QoL before and after being relocated. The results of the relocation project are not clear; on the one hand, it is known that the authorities tried to have a successful relocation project for the benefit of those affected, but, on the other hand, there are speculations that the relocation process has been difficult, and not everyone sees it in the same way.

Therefore, based on the information obtained, the main question of this research is: How does a relocation project impact, from the objective and subjective approaches, the QoL of people who were relocated due to the 2007 flood?

In order to address and answer this question, three hypotheses are established. The first hypothesis of this research suggests that the resettled people perceive their QoL better in their former location, even with the risk of another flood. However, as suggested by the literature, an analysis of QoL must take into account the perceptions of people and the features of the location where they live, as well. With these two approaches, this

research tries to discover whether the subjective conditions of relocated people match their objective living conditions. These two perspectives do not necessarily coincide. The fact that the authorities in charge of the relocation process did their best does not mean that those affected agree with that assessment. This leads to the second hypothesis, which states that the objective characteristics of the new neighborhoods, compared to the perceptions of the relocatees about their QoL do not match.

The last hypothesis stems from the following statements. Urban classical theory suggests that life in highly urbanized areas leads people to an isolated life with social disorganization and even major health problems. Moreover, it is believed that life in the suburbs is better, due to lower population density, lower crime rates and a more stable population (Adams, 1992). From the 70's, social and economic conditions, in the United States, have become feasible the migration from urban to suburban or rural areas. Migrants from urban to suburban areas chose to move due to the facilities to practice outdoor activities, presence of universities and retirement amenities (Williams & Jobes, 1990). Personal knowledge of the area allowed identifying two neighborhoods, where the affected people were relocated and these locations did not have the characteristics that make a suburban or rural life "better off" than the life in urbanized areas, mainly because these neighborhoods were not designed to retired people, they look over populated and people complain about security problems. There is not evidence that the QoL between the two neighborhoods is different. However, the one who is closer to the urban area could have better access to urban services such as: health services, better access to jobs, schools and security service and transport. It is of interest to this research

to examine the QoL of each neighborhood independently and with the prior knowledge that the inhabitants of these suburban areas share urban characteristics, a third hypothesis states that those who have urban services closer will have a better QoL.

1.2. Organization of the dissertation

The first section of this research presents a review of literature on relocation and QoL, analyzed from Global and Latin American perspectives. Subsequently, the second section describes the study area and an explanation of the particular causes of the relocation is offered. After describing the area of study, the research methodology is presented and it explains the instrument used to obtain the data and how the sample was collected and analyzed. In the next section, the analysis is performed according to the research aims and the results are shown and discussed. Finally, the conclusions, policy implications, limitations and further research are discussed.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

In a context where urban areas, mainly in LDC (Less Developed Countries), have grown exponentially the need for urban development plans is imperative, otherwise the growth of informal settlements is a permanent risk. These sorts of settlements are sources of social, economic and environmental concerns. Sometimes these low-income population, characterized by their low living standards, need to be relocated because they are settled in hazardous areas where they are deprived of the most essential services such as water or electricity (Anjomani & Ahmad, 1992; Dundar, 1996; Ferguson & Navarrete, 2003; Lora, 2010; Soemarno, 2010). In order to have a broader view of the concepts of relocation and QoL, they are addressed individually.

2.1. Relocation

Relocation can be defined as a process that may range from moving an entire community to a new site, to moving different sectors of the population to new locations either within the same city or outside of its limits (Mileti & Paserini, 1996). Relocation also refers to a form of involuntary change of residential site, through plans designed to restore those displaced to at least their previous standard of living (Ruel, Oakley, Ward, Alston, & Reid, 2013). In general terms, it refers to the restoration of economic and cultural resources (Gibson, 1993).

Relocation projects are undertaken for different reasons, including land tenure reforms, development projects, social upheaval, or natural disasters (Badri et al., 2006; Burbridge, Norgaard, & Hartshorn, 1988; Gibson, 1993; M. Hernández, 2011; Kinsey & Binswanger, 1993; Oliver-Smith, 1991). Relocation projects usually happen in two phases. The first phase involves moving the vulnerable population to shelters, where they are provided with temporary care, and the second phase occurs when people living in shelters move to their new and final location (Stal, 2011).

The study of relocations projects requires a multidisciplinary approach, since they involve economic, social, and environmental issues (Burbridge et al., 1988; Kinsey & Binswanger, 1993; Oliver-Smith, 1991; Tamakloe, 1994). Importantly, such projects may minimize the negative effects of the event, for example, social disintegration, a decline in income, increased expenses, and problems within the family (Chang, 2010; Hwang et al., 2010; Kinsey & Binswanger, 1993; Tamakloe, 1994). People may resist relocation because it threatens their social and cultural identity, jeopardizes their sources of income, access to work, to school, and to family and friends (Mileti & Paserini, 1996). However, on the other hand there is the possibility that people are willing to be relocated because they are aware of the danger in which they live and authorities should be prepared to provide adequate compensation to these people in the form of fund, land, or both (Soemarno, 2010).

There are several drawbacks that relocatees face during and after relocation processes. Any relocation process itself is stressful and it has been found that affected people have

a period of depression, both during and after the relocation process (Xi & Hwang, 2011). The length of this period of depression depends on how people adapt to their new environment. Other relocation project outcomes could be increased cost of living and childhood diseases (Tamakloe, 1994). Likewise, home overcrowding may occur when the characteristics of the new homes do not match with characteristics of their former homes (Oliver-Smith, 1991; Tamakloe, 1994). Despite the drawbacks mentioned above, some problems faced in the beginning of any relocation process may improve over time as the resettled people adapt to their new environment (Kinsey & Binswanger, 1993).

Relocation projects have been extensively studied. For instance, empirical evidence shows that in the 18th century, the inhabitants of the City of Guatemala, now known as Antigua, were ordered to vacate the city due to multiple earthquakes (Oliver-Smith, 1991). On the other side of the globe, in the 20th century, development programs in India caused the relocation of nearly 20 million people in 40 years (Cernea, 1997) and social conflicts and floods in Africa caused the relocation of a large number of people (C. C. Cook & Falloux, 1994; Chang, 2010; Stal, 2011). More recently, in 1985, a earthquake in Mexico City left around 100,000 people homeless (Inam, 1999). There is also the case of the Three Gorges Dam in China, where its construction displaced more than a million people (Hwang et al., 2010). The 1990 earthquake in Manjil, Iran left over 500,000 homeless (Badri et al., 2006). In 2007 a flood in southern Mexico affected approximately 1.5 million people (Perevochtchikova & Lezama de la Torre, 2010). In late 2013, a typhoon lashed the Philippines leaving a little more than 1 million homes damaged, with approximately 50% totally destroyed, and displacing over 4 million

people (Del_Rosario, 2014). These types of events illuminate the potential extent of relocation projects.

The success of relocation projects depends on the living conditions both before and after the move. Studies related to these sort of projects have found that in order to minimize their negative effects, it is necessary that the government agencies meet some requirements (Badri et al., 2006; Burbridge et al., 1988; French et al., 2010; Hwang et al., 2010; Oliver-Smith, 1991; Zorondo-Rodríguez et al., 2012), see table 1.

Table 1. Main activities that should be undertaken to ensure successful relocation projects

Requirements to have success in a relocation project	Main activities
Equity among the resettled and local populations	In the event that the relocated people are carried somewhere previously populated, both populations must have equal access to land use, materials, housing, financial assistance and public education and health services. This equality avoids clashes or conflicts in the community (Burbridge et al., 1988).
Matching, in the best way possible, new and former locations	In the event that economic activities are different in the new location, the relocated people need adequate training in new technologies or situations that are undergoing (Burbridge et al., 1988).
Paying attention to social, economic and health issues	This point involves a careful study of the conditions of those affected, in order to identify potential losses. A social survey may be necessary to identify those potential issues (Badri et al., 2006).

Table 1. Continued

Requirements to have success in a relocation project	Main activities
Involving affected people without hiding information	The communion between the top-down (local authority initiatives) and bottom-up (affected population opinions) approaches will result in a stronger relocation project with better chances to succeed (Zorondo-Rodríguez et al., 2012)
Having an appropriate compensation policy	This policy must be based on the actual market properties value (Badri et al., 2006)
Compensation for everyone regardless of tenure/ownership rights	Local authorities must compensate all relocatees, regardless of their property rights (Badri et al., 2006)
Recognizing losses and displacement costs	Compensation policies should recognize the lost land, housing, income sources and displacement costs (Badri et al., 2006)
Providing several options for compensation, such as cash, or temporary or permanent land replacement	It is important to ensure that the relocated people have the basic services, thus their incomes and livelihoods can be restored (Badri et al., 2006)
Paying special attention to the needs of single mothers, the disabled, elderly people and ethnic minorities	In the case of relocation projects due to natural issues, it has been found that the event makes a difference among the social structure. Not everyone is affected in the same way and their needs are different (French et al., 2010)
Strong organization	A good organization should allow the assistance of community groups and NGOs in order to accelerate the relocation process (Badri et al., 2006)

Table 1. Continued

Requirements to have success in a relocation project	Main activities
Effective monitoring and evaluating system	It is impossible to predict all the effects of a relocation project. However, an adequate monitoring system of the living conditions of the relocated will allow early detection of problems that could affect the project. For example, it is possible to conduct health campaigns to prevent diseases, monitor the water supply or access to sources of employment (Burbridge et al., 1988)

Source: Badri et al., 2006; Burbridge et al., 1988; French et al., 2010; Hwang et al., 2010; Oliver-Smith, 1991; Zorondo-Rodríguez et al., 2012.

The study of relocation become important since it is expected that in 15 years the urban areas located below 10 meters above sea level increase 230%, which could cause the growth of settlements in areas of high risk of flooding (Guneralp, Guneralp, & Liu, 2015). Although there is extensive literature on the subject, there is still much to learn about relocation (Ruel et al., 2013). For the purposes of this research, "relocation project" refers to an officially funded, planned and managed change of permanent residence, whether voluntary or involuntary, and its subsequent impact on the affected people.

2.2. Quality of life

The study of QoL involves many variables and it is a topic that has been studied from multiple perspectives, thus it is difficult to find a single statement that defines it (Gerson,

1976). Yet, QoL has been outlined mainly under three approaches. The first approach is based on the selection of those things that bring people greater satisfaction; the second approach dictates that the people's welfare depends on their philosophical or religious ideas; and the third approach is in terms of the experience of individuals regarding pleasure, feelings of joy, and satisfaction with life (Haq & Zia, 2013). However there are other approaches that has been used to measure QoL, as shown in figure 1 (Sirgy, 2001). Regardless the approach used, there will be a relationship between the satisfaction of individuals with their lives and at least one of the following dimensions: economic, social and environmental (Zorondo-Rodríguez et al., 2012). Furthermore, the QoL can be measured on different scales; for instance, the individual QoL has been studied for residents living near industrial areas (Ibrahim & Chung, 2003), or at a urban neighborhood level in Costa Rica (Luis J. Hall, Madrigal, & Robalino, 2008), or measuring the QoL across countries (Slottje, 1991). Figure 2 outlines the variety of levels at which it can be performed studies on QoL.

Figure 1. Theoretical perspectives of quality of life (Sirgy, 2001)
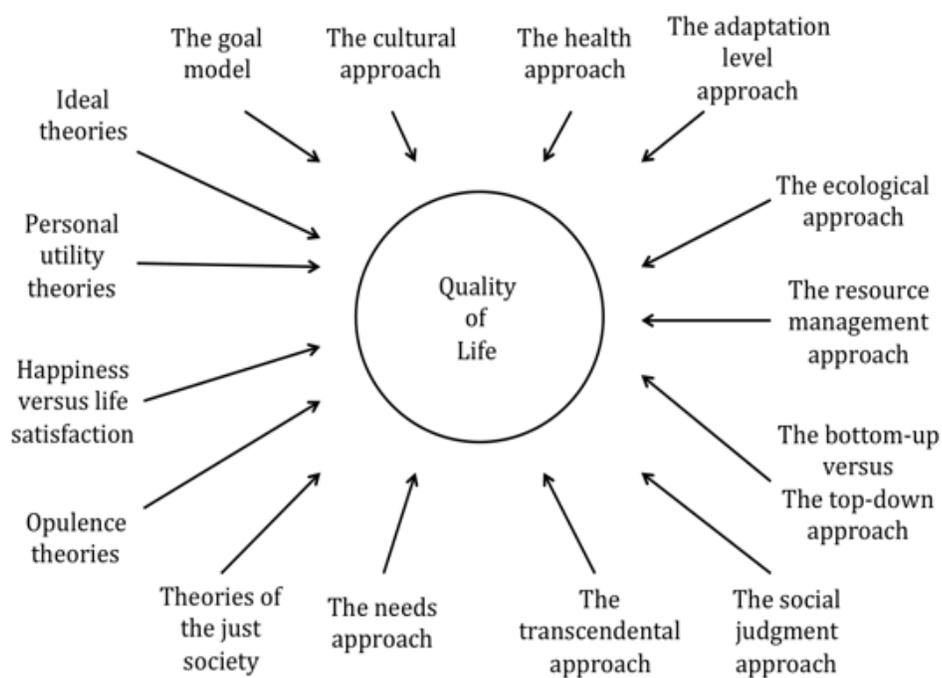
Figure 2. Examples of different scales to measure quality of life (Luis J. Hall et al., 2008; Ibrahim & Chung, 2003; Slottje, 1991)
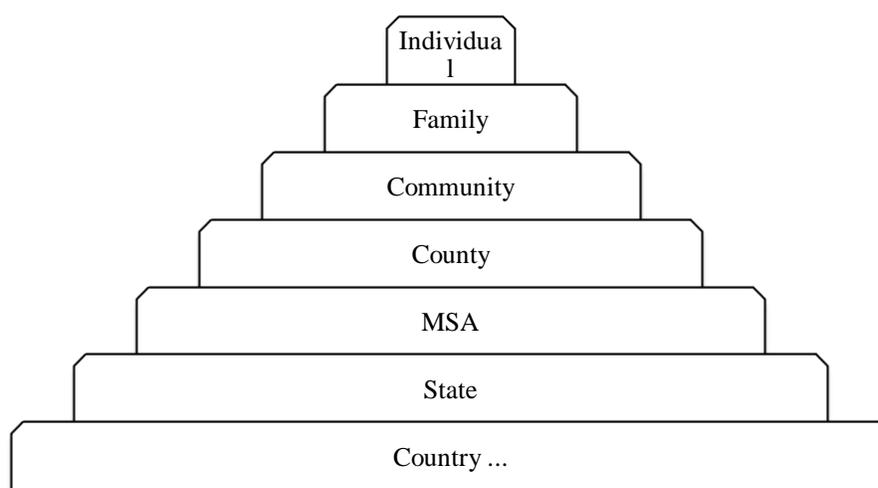
The concept of QoL has been associated with the terms "general welfare" and "social well-being" (Wish, 1986), and despite the lack of a unique definition, the urban and psychological literature concur that the QoL concept must include objective and subjective measures. The objective measures assume that individual QoL is based in socio-economic indices and the subjective measures are about the cognitive perception (Cummins, 2000; Haq & Zia, 2013; Tuan Seik, 2000; Wish, 1986).

The QoL variables can be measured through objective and subjective indicators. It depends on how the questions are asked. Table 2 shows an example.

Table 2. Subjective and objective approaches to measuring social, economic and environmental dimensions

Social Dimension *Education*	Objective	Level of education
	Subjective	How do you perceive the quality of your formal education?
Economic Dimension *Income*	Objective	Annual income
	Subjective	How do you perceive your income level in terms of your necessities?
Environmental Dimension *Weather*	Objective	Average temperature in summer
	Subjective	How do you perceive the summer time temperature in your area?

Source: Glatzer 2006 and Das 2008.

Often, QoL has been measured with preset objective indices, for example, the Human Development Index (HDI) or the Human Wellbeing Index (HWI). The HDI was

developed by the United Nations and it is based in three, equal weighted dimensions, health, education, and income. The main characteristic of the HDI is the differentiation of the population's welfare that lives in regions with similar economic growth (Islam, 1995; United_Nations_Development_Programme, 2008). The HWI mainly refers to the relationship between the ecosystem and people. It includes five key dimensions, health, wealth, knowledge, community, and gender equity. The five dimensions are related to the sustainable development of the community and its inhabitants (Glatzer, 2006). On the other hand, there are subjective QoL indices, such as the Overall Satisfaction of Life Index and the Personal Wellbeing Index. The former is largely based on the perception that people have about their QoL as a whole and the later argues that a single question cannot grasp the welfare of people. Hence, it includes seven questions about the individual's perception of QoL. These questions are related with personal satisfaction on health, standard of living, achievements, relationships, security, social integration, and future security (Glatzer, 2006). However, it is worth mentioning that the information provided by a specific index is not necessarily included in another because each of them has been created for specific situations (Diener & Suh, 1997). This ambiguity means that the objective and subjective approaches have their own strengths and weaknesses, as shown in Table 3.

Table 3. Strengths and weaknesses of objective and subjective approaches

	Strengths	Weaknesses
Objective Approach	1. Easily defined and quantified. 2. Easy to compare across different societies and time. 3. Reflect the normative ideals of a society. 4. Capture important aspects of society that are not sufficiently reflected in purely economic yardsticks.	1. They are fallible, (unreported crime). Poor quality databases affect authors' assumptions. 2. The inevitable role of subjective decisions in selecting and measuring the variables. (GDP does not consider volunteer work or housework). 3. Do they reflect the society's notion of a good life? 4. Determining the proper weight for the variables. 5. They may not accurately reflect people's experience of wellbeing.
Subjective Approach	1. They capture experiences that are important to the individuals. 2. They are easy to modify in later studies when proven inadequate. 3. They are measured in a common dimension such as degree of satisfaction (easy to compare).	1. It is naive to assume that every individual's responses are totally valid and accurate. 2. Answers depend on temperament and personal relationships. 3. Societies and individuals differ in the degree to which they believe that subjective wellbeing is a key attribute of good life.

Source: Diener and Suh, 1997

The importance of the strengths and weaknesses of each approach, objective or subjective, depends on the conditions of the population under study and the aim of the research project (Diener & Suh, 1997). Researchers should consider conducting field work or have prior knowledge of the study area in order to identify what is the right approach for a given research project. For example, a subjective response may depend on the mood or health of participants at the time of the interview or it could be due to the different opportunities in gaining access to certain environmental, economic, and social features. In regard to objective issues, there may be features that do not represent any

benefit for some people; for example, the presence of an elementary school may not represent a benefit for families who do not have school age children.

Through time, economists and sociologists have been concerned with measuring the population's wellbeing in economic and social terms respectively. However, the research on QoL makes clear that these two disciplines need to work together in order to achieve an accurate and comprehensive picture about how living conditions affect QoL (Cummins, 2000; Mapalad-Ruane & Rodriguez, 2003; Tuan Seik, 2000; Wish, 1986) (Cruces, Ham, & Tetaz, 2010; Powell & Sanguinetti, 2010).

In the 1930s, researchers began using the term QoL (Türksever & Atalik, 2001); in the 1960s, this concept was introduced as a separate and formal field of study (Flammang, 1979; Schuessler & Fisher, 1985). Yet, despite this new field of study, the literature has focused on either economic or social variables. For example, the economic growth approach is mainly related to an increase in the Gross Domestic Product (GDP) (Flammang, 1979; Soubbotina, 2004). GDP was frequently used up to the 1980s as a population welfare measure following the Kuznets's theory, which states that economic development leads to a more egalitarian society and therefore a society with a better QoL (Todaro & Smith, 2006).

The dilemma between social inequality and increased economic development over those who are most advantageous could be explained by the Kuznets's inverted-U hypothesis and the Gini coefficient of inequality. A greater social inequality leads to a lower QoL of the population as a whole. If the GDP increases, the Gini coefficient becomes larger

(more social inequality), to a point where the curve shows a negative slope and it starts taking the inverted U-shaped (figure 3). In the first stage of the curve, with a positive slope, those with better education are the greatest benefit (usually richer people). The theory says that the investments are applied in the modern sector of the industry. Jobs are scarce and wages far exceed the average income of the population. Subsequently, the country or region begins to transform its economy, previously supported in the traditional sector, into an economy based on modern industry and new technologies. Without a strong empirical evidence, Kuznets assumes that as the supply of employees, with better educational level, increases and the income rises, more people are able to invest, so the gap between rich and poor narrows again (Thorton, 2001; Todaro & Smith, 2006). However, history offers a number of examples where a country's economic growth is not matched similar progress in the population's QoL (Castañeda, 1996; Grayson, 1981; Villarreal & Villarreal, 1981). For example, an increase in the GDP of developing countries has led to higher rates of unemployment and excessive consumption of natural resources, among other negative effects, instead of improving the wellbeing of the population (Soubbotina, 2004). Even in rich countries, an increment in economic growth does not necessarily result in a higher level of personal welfare (Smyth, Nielsen, & Zhai, 2010).

Figure 3. The inverter–U Kuznets curve (Todaro & Smith, 2006)
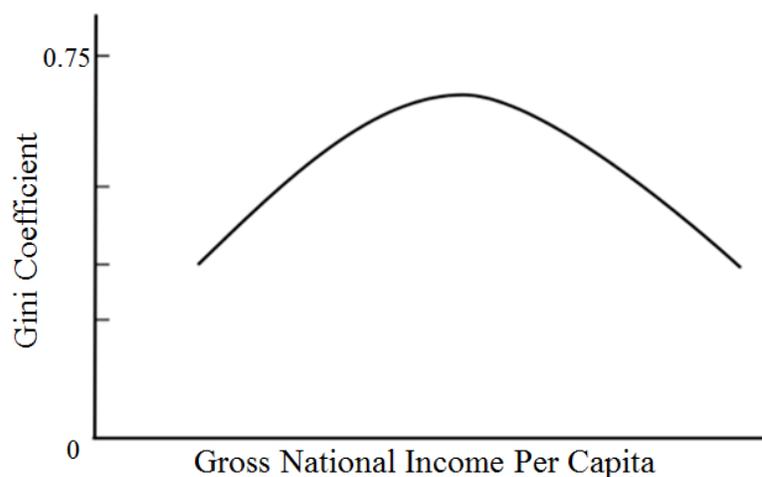
In order to achieve a better QoL for the population as a whole, the economic growth of a community or a larger area should be seen through three important concepts: first, standard of living; second, equity; and third sustainability (Blakely & Leigh, 2010). These three concepts involve a collection of elements that may be social, such as education, health, literacy rate, life expectancy, poverty, leisure time, and crime; economic, such as, employment, housing price, individual income and debt, and household income and debt; or environmental, such as, air and water pollution, public parks, and climatic conditions (Das, 2008; Glatzer, 2006; Hwang et al., 2010). Thus, this approach becomes inclusive of the issues that affect people from different income levels and at different scales, addressing the idea that global QoL is a function of evaluations conducted in various areas of life, for instance, family life, social life, economic life, community life, or spiritual life (Sirgy, 2010).

The scale of the study plays an important role in the selection of data sources. For example, research in a large geographic area usually requires secondary data sources. Typically, the smallest experimental area that uses a secondary data source is the county (Burd-Sharps, Lewis, & Martins, 2008; Mapalad-Ruane & Rodriguez, 2003; Marans, 2003). Contrary to this, the biggest constraint to measure QoL in small areas, whether objectively or subjectively, is the lack of detailed and reliable information. If a study focuses on small areas and it uses secondary data sources, it is recommended to support the research with primary data sources, such as surveys or personal intervention (Türksever & Atalik, 2001).

Most of the time, QoL is measured in larger geographical areas through objective indicators. A weakness of these studies is that they only use secondary data sources and the QoL existing in the suburbs may be different from downtown areas. Moreover, it has been found that the perception of people about their QoL is also important, a costly and difficult task to perform in large geographic areas (Das, 2008; Wish, 1986).

Another important issue in the QoL research is the selection of the relevant variables. The variables commonly found in these studies are: income, education, and health. Other variables, such as security, number of children in the household, and household characteristics, to name a few, have been used less frequently. Furthermore, some variables, such as water quality, tourism, or future expectations, appear only in certain QoL studies (Chen & Davey, 2008; Glatzer, 2006; Jagodzinski, 2009; Sirgy & Cornwell,

2002; Smyth et al., 2010; Tesfazghi, Martinez, & Verplanke, 2009). A detailed description of these variables can be seen in appendix A.

In the same way that QoL research agrees on the used variables, the methods of gathering and analyzing data are similar. Data are obtained from official or private databases, or through primary data sources, such as mail, e-mail, and phone surveys, or face-to-face interviews. The surveys in the QoL studies use open-ended and closed-ended questions. On the one hand, open-ended questions record the respondents' opinions in their own words and sometimes, they capture ideas and opinions that the researcher does not anticipate. Moreover, surveys with closed-ended questions allow responses within certain parameters preset by the researcher. For example, the Likert scale has been used with different ranges and different forms of response, from three or even more than ten options. An alternative of this scale is the Delighted-Terrible Scale, which encodes the answers with positive and negative numbers.

The data analysis in studies of QoL takes many forms. However, closed-ended questions are frequently analyzed with descriptive statistics, analysis of variance (ANOVA) and factor analysis. With respect to the open-ended questions, content analysis takes on particular importance as it allows for extracting and analyzing the opinions of the participants.

Studies on QoL in Latin America are very similar and follow the same methods and variables of the worldwide studies. The most mentioned variables in this sort of studies are income, health, security, household characteristics, and access to public services

(Alcazar & Andrade, 2010; Cruces et al., 2010; Luis J. Hall et al., 2008; Luis J Hall, Robalino, & Madrigal, 2010; Lora, 2010; Medina, Morales, & Núñez, 2010; Powell & Sanguinetti, 2010).

People´s QoL in urban settings depends largely on the surrounding areas. In this vein, Latin Americans, in relative terms, primarily live in urban areas (Lora, 2010). A researcher's concern lies in understanding how these urban people live and how they perceive the way they are living, as well as in exploring other factors that affect their QoL.

QoL research in urban areas may include a large number of variables, such as public transportation, road conditions, air and water quality, crime rate, access to green areas, education and health services, household income, per capita income, family members, number of children at home, home ownership (title deed), number of bedrooms, years living in the neighborhood, level of education, and housing prices (Cruces et al., 2010; Lora, 2010; Medina, Morales, & Núñez, 2008; Medina et al., 2010; Powell & Sanguinetti, 2010; Van-Pragg & Ferrer-i-Carbonell, 2010). All these variables can be used together or in groups, depending on the objectives of the research, to acquire a QoL index.

Research on QoL in Latin America has used different methodologies (objective and subjective) and dimensions (social, economic and environmental) to achieve its aims, finding similar conclusions. For example, the QoL studies in Buenos Aires, Argentina; Bogota and Medellin, Colombia; San Jose, Costa Rica; Lima, Peru; Montevideo,

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Uruguay; Mexico City, Mexico and Sao Pablo, Brazil have found that personal safety, quality of housing, and access to public services show a statistically significant difference. On the other hand, running water service, air quality, and education services do not show statistical differences (Lora, 2010; Powell & Sanguinetti, 2010).

A study in Argentina has shown that the number of bus stops and road conditions in the neighborhood are highly significant (Cruces et al., 2010). Research in Colombia found a positive correlation between house prices and house features, and neighborhood amenities, such as number of rooms, presence of gardens or garage, water service, better building materials, average level of education, distance to places of food supply, number of schools per capita. In addition, a negative correlation exists between house pricing and crime, educational inequality and unemployment rates (Medina et al., 2008, 2010).

Moreover, in the metropolitan area of San Jose, Costa Rica, a study showed that housing and security are the key components in determining life satisfaction. However, the study also found that income, health and neighborhood satisfaction are positively correlated with QoL. In an overall question about individual QoL, 74% of respondents rated their life satisfaction above 8, on a scale of 1 to 10 (Luis J. Hall et al., 2008; Luis J Hall et al., 2010).

The examples above on Latin America show that regardless of the geographic region, the variables that affect QoL are similar. However, the extent to which each variable affects each region will depend on the economic, social and environmental conditions that deprive at each location.

Therefore, as a working definition of QoL, this research defines it as a set of subjective and objective conditions affecting the life of the individuals in three dimensions: social, economic, and environmental.

The framework of this research incorporates two main concepts as noted before: the first is relocation, which involves moving people from one location to another, whether on a voluntary or involuntary basis and the second is QoL as understood from three dimensions.

3. AREA OF STUDY

This research was carried out in the state of Tabasco in the southeast of Mexico, specifically in the Centro municipality (see figure 4) (INEGI, 2010).

Figure 4. Location of Tabasco and the Centro municipality in the national and state context respectively

The primary division of the country is the state and each state is divided into municipalities. The municipalities are the basis for the policy and administrative management of the state. However, within municipalities, there may be different localities and a locality could be a small community or a large city. For census purposes, Mexico's geography is also divided in Basic Geo Statistical Areas (known as AGEBs for the Spanish language acronym). They are small urban or rural areas that INEGI

(National Institute of Statistics and Geography) defines for statistical purposes. An urban AGEB is a town of 2,500 inhabitants or more, or a municipal seat, regardless of the number of people, usually in sets ranging from 25 to 50 blocks. Rural AGEBs frame areas of about 25,000 acres, where the land use is predominantly agricultural, and they are communities of less than 2,500 inhabitants (INEGI, 2010).

3.1. Factors causing relocation in Tabasco

The state of Tabasco has suffered from floods, which have caused serious social, economic and environmental damage. There were at least seven significant floods in the state during the 20th century, (1912, 1957, 1963, 1969, 1973, 1980 and 1999) (M. Hernández, 2011).

In October 2007, a major flood struck the state, affecting mainly the Centro municipality and the city of Villahermosa causing extensive economic losses (SEGOB, 2008) The City of Villahermosa is the largest city in Tabasco and the 22nd most populous city in Mexico with 379,830 inhabitants. It is also the capital city of the state and the seat of the Centro Municipality (INEGI, 2010). The flood affected nearly 62% (15,290 square kilometers) of the state's territory and 75% of its population (approximately 1.5 million people) and it damaged a large number of homes, health centers and educational facilities (SEGOB, 2008). Due to the magnitude of the event, local authorities decided to permanently relocate the most affected population in safer suburban areas (S. Hernández, 2010). Local authorities agreed to build 2,500 houses to relocate those families who suffered damage to their homes due to living on riverbanks, which are the

areas of the city prone to flooding (Martínez, Domínguez, Navarro, Palacios, & Ramírez, 2008; Perevochtchikova & Lezama de la Torre, 2010).

A rapid urbanization and inadequate capacity to meet housing needs in urban areas have contributed to the development of informal settlements (WHO, 2012). In the state of Tabasco, these informal settlements have increased due to the lack of an urban development plan. It was not until 1997 that the state creates its first urban development plan (Gobierno_del_Estado_de_Tabasco, 2007). Nevertheless, this plan was not properly implemented as people still set in hazardous areas with a high probability of flooding. These informal settlements have been supported by the local authorities, who allow the obstructions and modification of river channels, lakes and regulatory vessels without environmental studies (C. López, 2010). As an example, figure 5 shows the construction of a new neighborhood within the Centro municipality and the landfill of what was once a regulatory water vessel.

Figure 5. A 2012 photograph showing the landfill of a regulatory water vessel

Source: Author's own photo.

3.2. Characterization of the area

After the 2007 flood, the relocated people went to two neighborhoods: 27 de Octubre and Ciudad Bicentenario, which were planned for housing families who suffered the ravages of the flood. These new neighborhoods are in the larger urban corridor of the state, with easy access to one of the main state roads (see figure 6).

Figure 6. Large urban corridor south of the city of Villahermosa, where the studied neighborhoods are located

This research focused in these neighborhoods where the government chose to relocate people because they are settled in areas free of risks of flooding. These neighborhoods offer a unique opportunity to contribute to the knowledge of the effects of relocation processes on people's QoL.

The 27 de Octubre neighborhood is located 9 miles away from downtown Villahermosa; on an approximately 42 acre area, it holds 747 homes and its street network shows a cul-de-sac distribution (INEGI, 2012). It consists of single-family homes with an average size slightly less than 322 square feet, with electric power service, sewage and tap water. 27 de Octubre belongs to the 27-004-0166-2486 AGEB, which is classified as an urban area (INEGI, 2014).

Table 4. Characterization of the study area

Studied Neighborhoods & The City of Villahermosa	27 de Octubre	Ciudad Bicentenario	City of Villahermosa
Neighborhood characteristics			
Distance from Downtown Villahermosa	9 miles	14 miles	N/A
Approximate Area	42 acres	106 acres	15,117 acres
Number of houses[a]	747	1121	119,758
Residential density	17.8 residential units/acre	10.6 residential units/acre	7.9 residential units/acre
Median size of single family home	291 sq ft house 582 sq ft land	291 sq ft house 679 sq ft land	N/A
Four-plex housing (two story building)	None	506 sq ft	N/A
Multi-unit housing (four story building)	None	517 sq ft	N/A
Street network distribution	Cul-de-sac	Mixed (grid-like and cul-de-sac)	N/A
AGEB Id	27-004-0166-	27-004-0494	27-004-xxxx
Type of AGEB	Urban	Rural	Urban
Participant characteristics[b]			
Median of people per household	4	4.5	3.7
Median education (Grade)	9	9	11
Median household income[c]	$5,300	$8,000	$13,300
Median age	45	46	N/A
Gender (%Female)	61.2	69.3	N/A
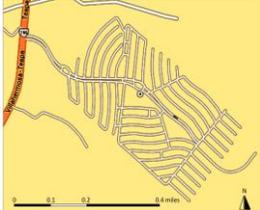
[a] Estimated based on the 2012 National Inventory of Housing data.
[b] Survey sample
[c] Annual income in USD (Exchange rate USD:MxPeso; 1:13.5)
Sources: Research survey and (INEGI, 2010)

The Ciudad Bicentenario neighborhood is located 14 miles away from downtown Villahermosa; on an approximately 106 acre area, it holds 1,121 homes and its street network is a mixed (grid-like and cul-de-sac) distribution (INEGI, 2012). It is constituted of three types of dwellings: a) single-family homes that average 352 sq. ft.; b) 452 sq. ft. four-plex homes and c) 517 sq. ft. apartments (8 apartments per 4 story building), all of them with electric power service, sewage and tap water. Ciudad Bicentenario belongs to the 27-004-0494 AGEB, which is classified as a rural area (INEGI, 2014). Table 4 shows the main characteristics of both neighborhoods, as well as some characteristics of the city of Villahermosa.

4. METHODOLOGY

This is a study of two suburban areas of the Centro Municipality, in the Mexican state of Tabasco. The core of this research addresses the QoL of relocated people, using social, economic, and environmental dimensions.

In order to analyze QoL before and after a relocation process, this research uses both primary and secondary data. Primary data were collected through a survey (see appendix B). The survey's design was based on the global literature about QoL (Chen & Davey, 2008; Glatzer, 2006; Jagodzinski, 2009; Leeuw, Hox, & Dillman, 2008; Smyth et al., 2010; Tesfazghi et al., 2009), with a special focus on Latin American studies (Alcazar & Andrade, 2010; Cruces et al., 2010; Luis J Hall et al., 2010; Lora, 2010; Medina et al., 2008, 2010; Powell & Sanguinetti, 2010; Van-Pragg & Ferrer-i-Carbonell, 2010). The secondary data come from the national housing inventory and the Mexican digital map (INEGI, 2012, 2014) that is a Geographic Information System (GIS) developed by INEGI and integrates information from natural and cultural elements of the geographical environment of the country. Figure 7 shows a concise conceptual model of the research. For an extended conceptual model see appendix C. The conceptual model shows how from certain variables in three dimensions; it is addressed the QoL of people, but not before having the intervention of some demographic characteristics.

Figure 7. Conceptual model of the research


```
                    ┌─────────────────────────────┐
                    │   MODERATOR VARIABLES       │
                    │  Location (dist. to downtown)│
                    │      Before relocation       │
                    │      After relocation        │
                    └─────────────────────────────┘
                                   │
                                   │
                                   ▼
┌──────────────┐    ┌──────────────┐    ┌──────────────────┐
│  PREDICTOR   │    │  MEDIATOR    │    │ SOCIO-ECONOMIC   │
│  VARIABLES   │───▶│  VARIABLES   │───▶│      AND         │
│  Objective   │    │    Social    │    │ ENVIRONMENTAL-   │
│  Subjective  │    │   Economic   │    │    RELATED       │
│              │    │ Environmental│    │ QUALITY OF LIFE  │
│              │    │              │    │     INDEX        │
└──────────────┘    └──────────────┘    └──────────────────┘
```
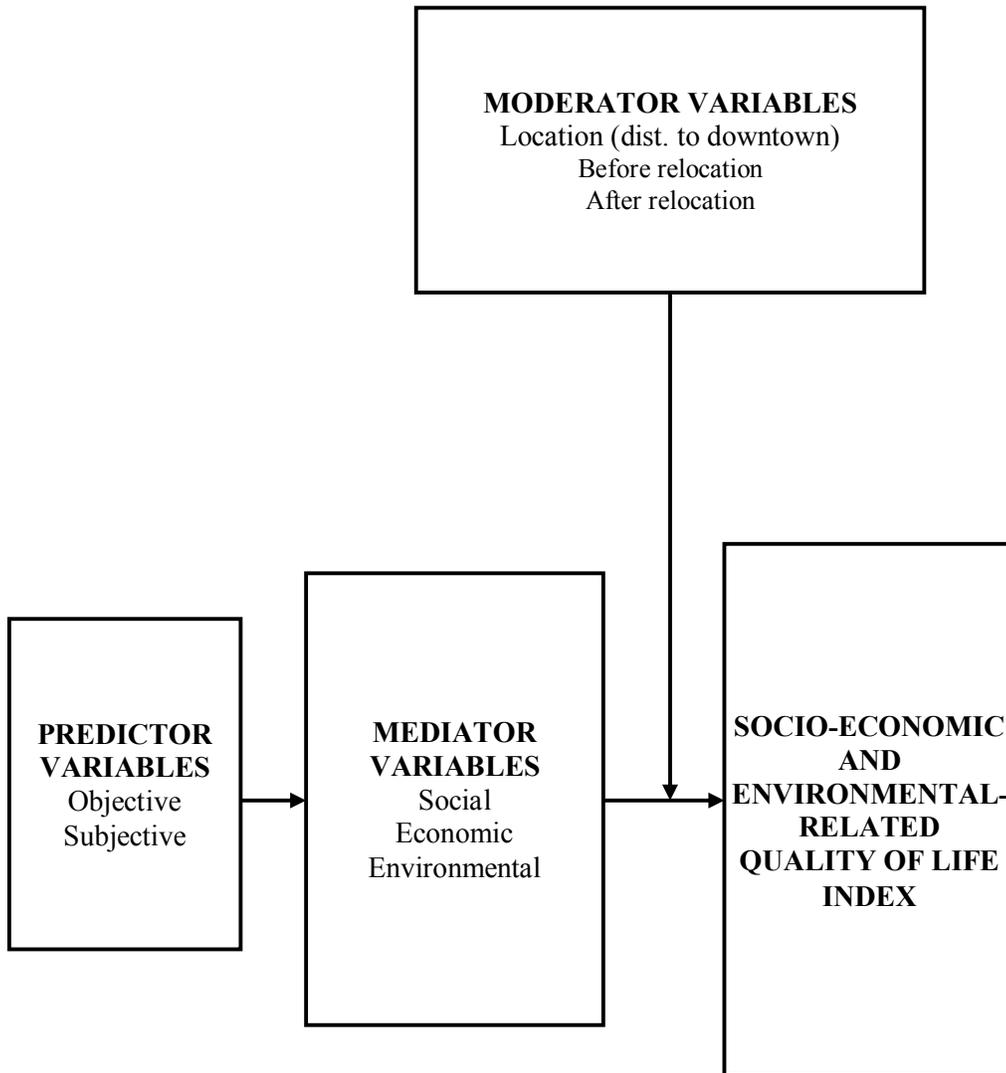
4.1. The survey

The survey was administered via face-to-face interviews. Other methods of surveying, for instance, e-mail or telephone surveys, were not possible because households, at the study area, still do not have internet services or phone lines. *Ceteris paribus*, a face-to-face interview is the most expensive method, because it involves human resources and it is time consuming. However, this method ensures that the surveys were completely filled due to personal interaction. A face-to-face interview allows the interviewer to provide a hard copy of the survey and encouraging participants to answer the full questionnaire, clarifying questions and offering additional information. Similarly, the interviewer can verify that the participants provide coherent answers (Leeuw et al., 2008). The interviews were conducted in Spanish, ensuring that participants understood each one of the questions and the way they must be answered.

A fieldworker (interviewer) who shares similar socioeconomic characteristics with the population of the study area was trained in order to minimize the negative effects that an interviewer may have due to appearance, speech and dress. These features build confidence of the participants and they tend to be more honest and collaborative with the interviewer (Leeuw et al., 2008).

The survey was authorized by the Texas A&M Institutional Review Board (ID # IRB2014-0038). It was conducted at the household level and aimed to reach anyone 18 years or older. The participants were aware that taking the survey was voluntary and that it would not affect them in any way. At any time, participants could choose to stop

answering the survey, if they so desired. An information sheet about the research was provided to each participant before the interview started (see appendices B I and B II). This information sheet provided information on the objectives, risks, costs, benefits, and privacy of the survey.

The survey was made up of two main parts, a subjective one and an objective one. The subjective part consists of four open-ended and 58 closed-ended questions; these last ones were answered using a Likert scale, and the objective part consists of 36 closed-ended questions. The questions were rationally ordered in the survey. The open-ended questions that required an intuitive response were placed in the beginning of the questionnaire to prevent the possibility that the closed-ended questions would have any effect on the open responses of participants (Tesfazghi et al., 2009) The subjective and objective closed-ended questions came later and finally, there was a set of general demographic questions.

The first section of the survey asked whether people were voluntarily or involuntarily relocated and then two open-ended questions asked about the process of relocation followed by other two open-ended questions about QoL before and after being relocated. The second section consists of a single closed-ended question. It asked participants to rate their overall QoL before and after being relocated and the response was recorded on a Likert scale from 1 to 5, where 1 = very good, 2 = good, 3 = neither good nor bad, 4 = bad, 5 = very bad. A five-option Likert scale was used because it is reliable and it has

been commonly used in multiple studies (Ghaedi, Tavoli, Bakhtiari, Melyani, & Sahragard, 2009; Leung, 2009; Likert, 1932; WHO, 2004).

Sections three, four and five consist of subjective questions. These sections asked participants to rate specific characteristics (variables) of their life before and after being relocated using the same Likert scale. The third section covered the social dimension using 11 variables (safety, public transportation, distance to work, distance to health center, distance to school, road conditions, existence of police officers, service at the health center, quality of local schools, participation in social groups, and relationship with neighbors). The fourth section addressed the economic dimension through 11 variables (sq. mts. Home, sq. mts of land, number of bedrooms, number of bathrooms, tap water service, sewer service, flooring of the house, roof of the house, income, debt, and job). The fifth section is about the environmental dimension. It consist of six questions (existence of green areas, condition of green areas, garbage collection service, air pollution, sonic contamination, and existence of graffiti) (Chen & Davey, 2008; Luis J. Hall et al., 2008; Jagodzinski, 2009; Medina et al., 2008).

The subjective variables have been proven valid in the measurement of the QoL construct (Tesfazghi et al., 2009; Yiengprugsawan, Seubsman, Khamman, Lim, & Sleigh, 2010; Zorondo-Rodríguez et al., 2012).

Sections six, seven and eight consist of objective questions. Questions in these sections were paired with the subjective questions. The survey was purposely designed to allow comparisons between the subjective and objective responses. In this section of the

survey, some answers were obtained by the interviewer's simple observations, such as the type of roof or floor of the house.

Finally, the survey included general demographic questions i.e. gender, age, education and marital status. The actual survey can be found in appendices C I and C II.

Prior to the extensive fieldwork, the survey was tested for its reliability using the test re-test methodology, and the kappa statistic (Landis & Koch, 1977; Sim & Wright, 2005). The kappa coefficient is a statistical measure that adjusts the effect of chance in the proportion of observed agreement for qualitative factors (categorical variables). This research followed the Landis and Koch, (1977) kappa statistic classification as follow:

Table 5. Kappa statistic classification

Kappa Statistic	Strength of Agreement
<0.00	Poor
0.01-0.20	Slight
0.21-0.40	Fair
0.41-0.60	Moderate
0.61-0.80	Substantial
0.81-1.00	Almost Perfect

The internal consistency of the survey was tested using the Cronbach alpha coefficient (Cortina, 1993; Mitchell & Jolley, 2013; Santos, 1999).

4.2. Sample size

The sample size was calculated using the formula from Berenson, (2001):

$$n_{si} = \frac{(n_{p_i})(p_i)(1-p_i)}{(n_{p_i}-1)\left(B_i \middle/ C_i\right)^2 + (p_i)(1-p_i)} \tag{1}$$

Where;

n_s = Sample size

i = Neighborhood

n_p = Population size.

p = The proportion of population expected to choose, for example, a yes or no answer.

B = The acceptable amount of sampling error of the true population value.

C = Confidence level.

In order to compute the sample size, it was accessed the national housing inventory (NHI) (INEGI, 2012) that is an official and public data base. It presents statistical information in housing with a territorial vision for communities of less than 2,500 inhabitants; and a block vision for localities of 2,500 or more inhabitants. The NHI reports that the two neighborhoods contain 1,868 houses where relocated people live. This study sets the most suitable value of p at $p = 0.5$, since this value does not underestimate the size of the sample (Berenson, 2001). An acceptable sampling error (B) could be in the range of 3% to 10%; in this study, it is fixed at 5%. Using a confidence level of 90%, then $C = 1.645$ (Berenson, 2001). The values of the last two parameters

were selected in order to achieve a manageable sample size and maintain a reliable statistical range. With these data, it is estimated that the sample size is equal to 238 households (n = 238). Further details showed that 60% of the relocatees' houses are in Ciudad Bicentenario and 40% are in 27 de Octubre. The sample collected was distributed in these proportions. For practical purposes, I selected a total sample of 266 households, 116 from the 27 de Octubre neighborhood and 150 from the Ciudad Bicentenario neighborhood (n=266, n_1=116 and n_2=150) that at the end they were the actual surveys collected.

4.3. Selecting the sample

In order to obtain a representative sample from both neighborhoods, they were divided into sections and equal number of units of analysis (households) was chosen from each section (See figure 8). Within each section, a random selection of households was performed. If a selected household was uninhabited or its residents were not willing to participate in the study, that house was removed from the sample and the one to its right side was added to the sample. If that house could not be included then the house on its left was added to the sample, and so on.

Figure 8. Grid of the study area
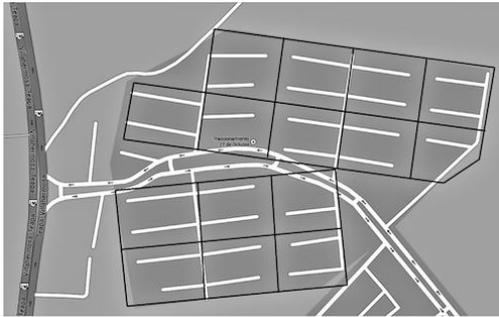
The 27 de Octubre neighborhood consists of 15 sections, 14 of them contributed 8 surveys each and the remaining section provided 6 surveys
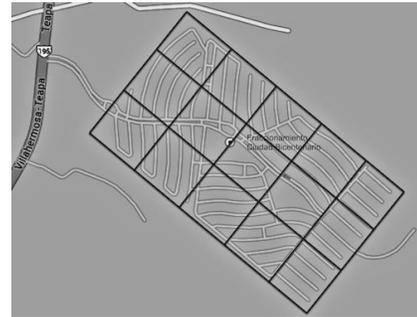
The Ciudad Bicentenario Neighborhood consists of 15 sections; each section contributed 10 surveys

Before starting the fieldwork, two interviewers were selected and trained using the principles of the CITI (Collaborative Institutional Training Initiative) program and authorized by the Texas A&M Institutional Review Board. An adequate training of field workers in methodological and ethical issues promotes beneficial interactions between the researcher, interviewers, and respondents. Therefore, the quality of the collected data is better (Leeuw et al., 2008). The survey was conducted between March 7 and May 24, 2014.

4.4. Statistical analysis

The statistical analysis had two main approaches the analysis of subjective questions and objective questions. The analysis of the subjective questions started with the content analysis of the open-ended questions (Krippendorff, 1989) and continued with the analysis of the Likert scale questions by comparing their means. On the other hand, the

evaluation of the objective questions was performed using principal component analysis. Finally, both analyses, subjective and objective, were combined and summarized. It was used the SPSS 22.0 software as a statistical analysis tool. Figure 9 illustrates the flowchart of the statistical analysis procedure.

4.4.1. Content analysis methodology

The content analysis methodology was used to quantify and objectively describe the content of written, oral or graphic communications, such as articles, newspaper text, photos and surveys (Berelson, 1952). Qualitative content analysis has been widely used in political, social, communication, and psychological sciences as well as in urban studies (Antrop, 2001; E. Cook, 2002; Chiesura, 2004; Lyles, Berke, & Smith, 2014). It belongs to the field of descriptive research that attempts to discover the basic components of a given phenomenon (F. López, 2002).

This research used content analysis to identify words and short phrases in the answers of four open-ended questions (shown below). These words and short phrases are called "units of analysis". After the units of analysis were defined, they were grouped according to their similarities. Then another analysis is performed to divide the groups according to their contents. For example, on the one hand there may be groups that express negative or positive opinions only. This type of analysis calculates the absolute and relative frequency of each group and thus, it is able to draw conclusions about the opinions expressed by participants (Antrop, 2001; F. López, 2002).

Figure 9. Statistical analysis flowchart
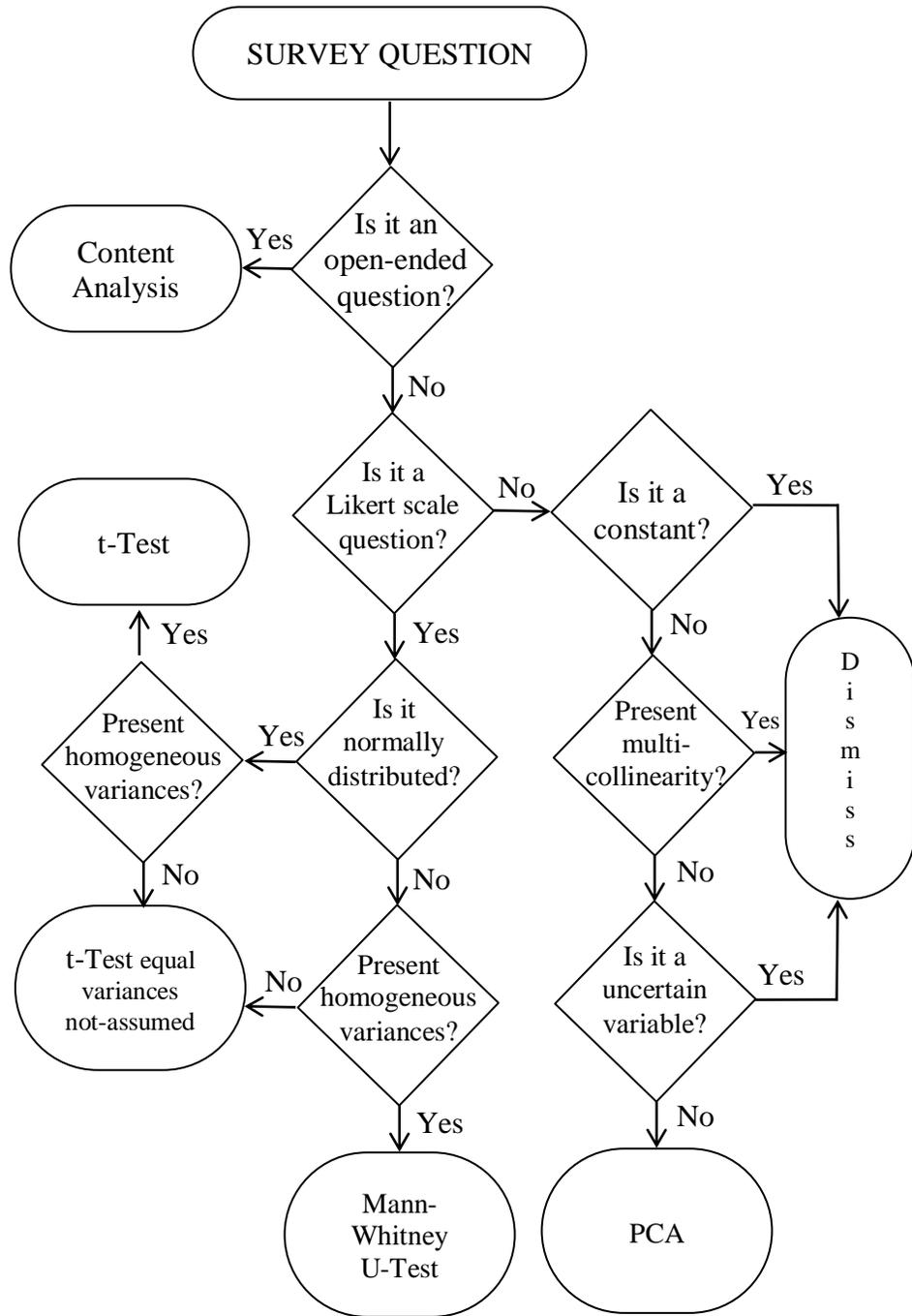
The first two questions captured the opinions of the relocatees about the relocation process and the third and fourth questions are related to the current living conditions compared to their living conditions before being relocated:

- What do you think about the relocation process? (Personal safety, safety of personal belongings, treatment by the authorities, transport, time, etc.)

- Why do you think that?

- How satisfied are you with your current life versus your life before relocation?

- Why do you think that?

These open-ended questions represent an opportunity for relocatees to openly express the issues that impacted their lives. The participants were not forced in any manner to direct their responses in any way. The analysis of the questions was carried out initially with the entire sample (n = 266). Subsequently, similar analyses were performed with the data from each neighborhood (n_1=116 and n_2=150).

In order to establish the reliability of the coding process of the relocatees' answers, it needs to encode a sample of surveys two times. Therefore a random sample of surveys was taken (n=10) and they were coded two times (ten days apart) by the same encoder. Four surveys were taken from 27 de Octubre and six surveys from Ciudad Bicentenario. The results of the two encoding processes were compared to verify, using the kappa statistic, the agreement between both results.

The content analysis contributes to this research in the sense of gathering open thoughts of the participants and helping to build stronger conclusions about the main factors affecting the QoL of relocated people.

4.4.2. Comparison of the subjective quality of life between before and after being relocated

To compare the subjective QoL of the resettled people, the mean values of the 29 variables analyzed were used. This analysis consists to verify if the values of both scenarios (before and after being relocates) are statistically equal or not. First it was verified whether the distribution of the data had normal distribution by measuring the skewness and kurtosis parameters. Skewness measures the lack of symmetry in the distribution curve (see figure 10) and the kurtosis measures the peakedness or flatness of the distribution curve (see figure 11) (Casella & Berger, 2002). Then three different statistical tests were performed depending on the distribution of sample data (explained below).

Figure 10. Examples of positive and negative skewness
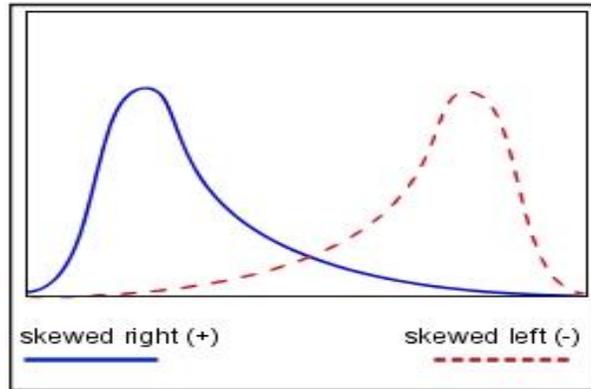
Figure 11. Examples of positive and negative kurtosis
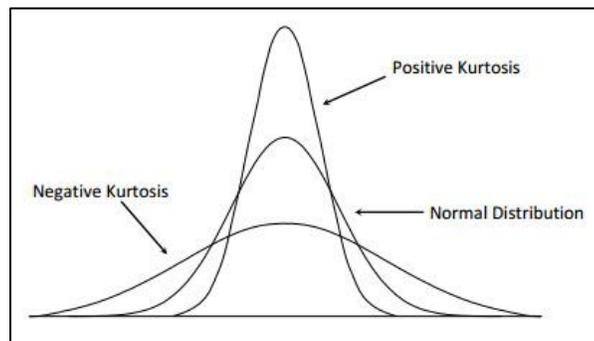
Comparisons of means were conducted for the full sample ($n = 266$) and for each of the neighborhoods ($n_1 = 116$ and $n_2 = 150$). In this research, a significance level of $P < .05$ was used for all the statistical tests. The samples were analyzed for normal distribution, skewness and kurtosis deviations with the Shapiro-Wilk's test (Cramer, 1998; Cramer & Howitt, 2004; Doane & Seward, 2011; Razali & Wah, 2011; Shapiro & Wilk, 1965).

The parametric and non-parametric Levene's tests were used to verify the equality of variances (Nordstokke & Zumbo, 2010; Nordstokke, Zumbo, Cairns, & Saklofske, 2011) and the Mann-Whitney U test, the t-test and the t-test (equal variances not assumed) were used to compare the means (Graeme, 2006).

4.4.3. Comparison of current quality of life between the objective and subjective approaches

The calculation of the objective QoL was performed by principal component analysis. This type of analysis selects those variables that tend to be constant and it groups those variables that represent a greater percentage of the variance of the sample.

The individual objective QoL score was calculated following equation two, where A is each participant, F is a vector that represents the variables in each component from the PCA, β is a vector of the percentage of variances explained by each component, j is the number of variables, and e is the number of components.

$$A = \sum_{e=1}^{E} \sum_{j=1}^{J} \beta_e F_j \bigg/ 100 \tag{2}$$

The process of analyzing objective and subjective responses involved two different types of data: continuous and categorical data. There are different methods to merge and compare data from different sources and at different scales (Freudenberg, 2003). The objective data were transformed into the same scale as the subjective scores (1 to 5), using the minimum-maximum standardization method, also known as "distance from the

best and worst performers" method. This method was partially modified because of the

coding approach of the Likert scale used in this research, as shown in equation 3.

$$(A_T) = 5 - [5 * (A - A_{min}) / (A_{max} - A_{min})]$$ (3)

Where: A_T is the individual objective QoL score transformed, A = actual value, A_{min} =

minimum value, and A_{max} = maximum value.

Next, the average of the QoL indices from all the participants was calculated in order to

obtain an index of the population under study (equation 4).

$$O\_QoL = \sum_{i=1}^{I} A_T \Big/ I$$ (4)

The score of the subjective QoL was calculated, based on the X_{ij} matrix, which

represents the scores of all participants (i) and each one of the variables (j).

The final subjective QoL score, of the total sample, was computed by averaging the

scores of the twenty-eight variables for each participant (equation 5) and then by

averaging the scores of all the participants in the sample (equation 6). B represents a

subjective QoL scores of each participant; J is the number of variable and X_j represents a

vector of the 28 variables.

$$B = \sum_{j=1}^{J} X_j \Big/ J$$ (5)

$$S\_QoL = \sum_{i=1}^{I} B_i \Big/ I \qquad\qquad (6)$$

Finally, and in order to observe if the objective and subjective scores match, a comparison of the scores was done.

4.4.4. Comparison of the overall quality of life between both neighborhoods

By analyzing the subjective and objective questions together, their similarities or differences could be ascertained and the overall QoL could be classified as well-being, deprivation, adaptation, or dissonance (Craglia, 2004) (see table 6). If both subjective and objective conditions obtain a "good" classification, it means that there is well-being in the population. If both conditions obtain a "bad" classification, then there is deprivation among the population. On the other hand, if there is a combination of a good and a bad classification, then dissonance or adaptation exists. The former is met when the subjective conditions are bad and objective conditions are good and the latter is fulfilled when subjective conditions are good and objective conditions are bad.

Table 6. Classifying QoL according to subjective and objective characteristics

	Objective approach	
	Good	Bad
Subjective approach		
Good	*Well-being*	*Adaptation*
Bad	*Dissonance*	*Deprivation*

Craglia, 2004

To classify any approach as good or bad, a breakpoint value that lies within the Likert scale used must be chosen. Scores on either side of the breakpoint value receive a different classification. A value of 3.0 was selected as the breakpoint, since it is the middle point in the Likert scale used. A value lower than three is classified as good; otherwise, it is classified as bad. This classification reflects the way that the Likert scale was used.

5. ANALYSES & RESULTS

This section is divided into three parts, first the reliability of the survey is analyzed, then the internal consistency of the survey is analyzed and finally the data, from the survey, is analyzed and the results are discussed. This last part is done in three steps: first, the analysis of the total sample; second, the analysis of the 27 de Octubre data; and third, the analysis of the Ciudad Bicentenario data.

5.1. Reliability

A pilot sample (n=6) was taken to test the reliability of the survey. The survey was administered twice to six individuals, fifteen days apart to measure the degree of consistency (reliability) between each interviewee's responses (Cronbach, 1947; Kline, 2000; Landis & Koch, 1977; Sim & Wright, 2005). The results showed an average kappa coefficient of 0.740 (n=58), meaning that the strength of agreement between the answers of the participants was substantial (Landis & Koch, 1977; Stemler, 2004) and the instrument was reliable.

5.2. Internal consistency (Cronbach alpha)

The internal consistency of the survey was tested by using the Cronbach alpha coefficient that measures the correlation among the Likert scale responses within the same survey (Mitchell & Jolley, 2013). The outcome of the test showed good intra-item correlation with an alpha coefficient of $\alpha = .779$ (Kline, 2000). An alpha coefficient

value higher than .700 indicates a good positive correlation between the items that are supposed to have something in common, as they measure the same construct. (Cortina, 1993; Mitchell & Jolley, 2013; Santos, 1999).

5.3. Data analysis

The analysis is based on responses to the given survey that is composed of two main parts. The first part consists of a content analysis technique applied to four open-ended questions. The second part of the analysis consists of two sections: the first section contains subjective questions and the second section is composed of objective questions. This part of the analysis was performed using the comparison of means tests and factor analysis.

5.3.1. Content analysis

The open-ended questions from the survey address:

- The relocation process: what do affected people think about the process and why?

- The quality of life: what do affected people think about their actual QoL versus their QoL before being relocated and why?

Thus, the research could capture people's concerns that were not covered in the survey. But at the same time, the open-ended questions also contributed to validate questions that were present in the survey.

The unit of analysis for the open-ended questions was identified as a short phrase; such phrases were organized into groups according to their similarities. Once grouped, the absolute frequency and percentage of each group of phrases were computed. A test-retest method tested the reliability of the process of clustering the short phrases. A ten day test-retest showed "almost perfect" reliability for the coding process (n=30, average kappa of .888 for groups) (Landis & Koch, 1977).

5.3.1.1. Content analysis for the total sample

At this point, the two neighborhoods were analyzed together as a single sample. Participants used different arguments to answer the first open-ended question. On the one hand, participants expressed bad experiences or negative answers, for instance: "the move was bad" or "there were many problems during the move." On the other hand, a good experience or positive comment might be stated as: "there was no problem during the move" or "everything was alright." Following the above reasoning, the answers from this question were coded negative or positive. Figure 12 shows participants' answers about the overall relocation process; 119 of the answers (45%) were coded positive and 147 (55%) were coded negative.

Figure 12. Percentage of people with positive and negative attitudes about the relocation process (n = 266)
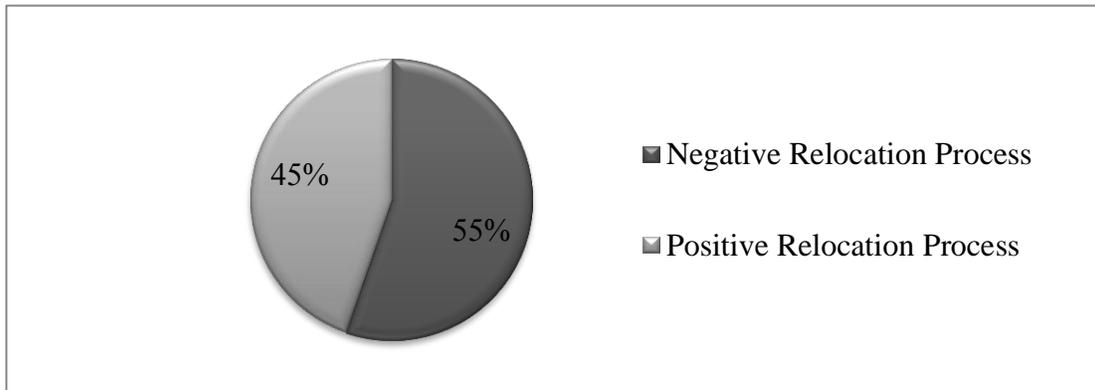
As seen in figure 12, the answers about the relocation process were divided; it is possible that negative evaluations were due to particular problems rather than intrinsic problems of the relocation process. The same rationale applies for those who evaluated it positively.

In order to know why people chose negative or positive evaluations, a second question was asked: why do you think positively or negatively in question one? Some of the responses received were: "the personnel who carried out the move broke our belongings," "the personnel who carried out the move were rude," "the move was against our will," "we lost belongings during the move," "the relocation process was safe" or "the relocation process was smooth." The results from this question are presented as absolute frequencies and percentages in table 7. Seven groups, with more than five counts each (frequency) of similar short phrases were identified by the content

analysis. There are two groups with an absolute frequency well above all others. However, these two groups contradict each other directly and had almost the same frequency: 109 participants said they suffered verbal abuse during the relocation process and 106 said the relocation process was carried out smoothly. This result agreed with the findings from the previous question. Furthermore, four of the other five groups showed a negative perception (involuntary relocation, lies and scams of the authorities, unsafe process and loss of belongings). Only the last group mentioned that the process was safe and represented less than 5% of the sample. These observations suggest that the relocation process was not satisfactory. It should be mentioned that participants' answers might be included in more than one group, depending on their answers.

Table 7. Absolute frequencies and percentages of the main issues highlighted by the participants about the relocation process (n = 266)

Groups	Frequency	Percentage
Abuses in the Relocation Process	109	40.98%
Smooth Relocation Process	106	39.85%
Involuntary Relocation	55	20.68%
Lies and Scams of Authorities	24	9.02%
Unsafe Process	18	6.77%
Loss of Belongings	15	5.64%
Safe Process	12	4.51%

On the one hand, those who had problems with the relocation process were also more likely to explain the situations that affected them at that time. The people's complaints

are understandable since more than 50% of the resettled people were forced to leave their homes, leading to conflict with those responsible for the eviction. On the other hand, the people who had no problems during the relocation process usually did not make comments about the positive nature of the relocation process. They simply said that the process was smooth and safe.

In the third open-ended question, different types of answers were recorded, such as: "now we live worse" or "life was better in the former location." These types of answers were recorded as "dissatisfied with the current life" because people were upset with their current living conditions. Moreover, for an answer to be encoded as "satisfied with the current life," it should clearly state that the current life was better than the previous one, for instance, an actual answer was: "life is better now". The analysis showed that 224 (84%) participants were dissatisfied with their current life versus their life before being relocated and 42 participants (16%) said otherwise (see figure 13).

Figure 13. Percentage of people satisfied or dissatisfied with their current way of living compared to their way of life before being relocated (n=266)

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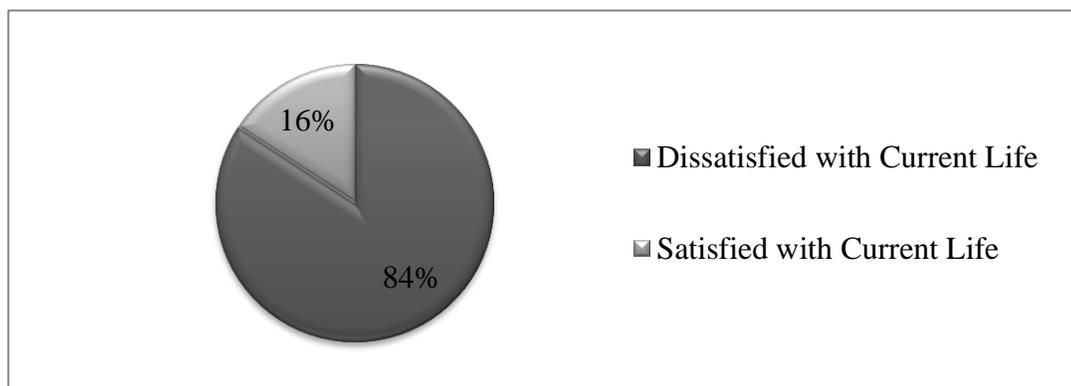
Originally, we noted that the relocation process was assessed equitably among those who felt that it was positive and those who thought that it was negative. This means that about half of the resettled people came to the new location after having gone through a process of relocation that met their expectations. However, the analysis of the third open-ended question shows that the majority of those resettled were not satisfied with their current living conditions compared to their previous life. Thus, it can be concluded that the people with a smooth relocation process later felt deceived.

The fourth open-ended question addressed the "whys" of the third question (why were people satisfied or dissatisfied with their current life with respect to their life before being relocated?). Some of the answers to this question were: "the new houses are too small", "there is more crime in the new neighborhood", or "the transportation cost has increased". The results from this question are presented as absolute frequencies and percentages in table 8. Twelve groups, with more than five counts each of similar short phrases, were identified. The main complaint was the size of the new house. Besides that, some of the specific reasons for being unhappy with life in the new location were: high crime rate, presence of garbage in the streets (pollution), unpleasant place, a bad neighbor relationship (neighbors issues), utility issues, depression, and high cost of transportation (transportation issues).

Table 8. Absolute Frequencies and percentages of the main issues highlighted by residents about their current way of life compared to life before relocation (n=266)

Groups	Frequency	Percentage
Size of House	100	37.59%
Life Better Before	69	25.94%
Crime	66	24.81%
Pollution	61	22.93%
Dishonesty	37	13.91%
Uncomfortable, Awful	27	10.15%
Unpleasant Place	25	9.40%
Neighbor Issues	25	9.40%
Utility Issues	23	8.65%
Depression	22	8.27%
Life Better Now	12	4.51%
Transportation Issues	8	3.01%

It can be seen from table 8 that the main complaints of the participants were given in the three studied dimensions (social, economic, and environmental) but it is noteworthy that the size of new homes (economic dimension) is at the top.

5.3.1.2. Content analysis for the 27 de Octubre neighborhood sample

The content analysis for 27 de Octubre (n1=116) showed that 62 (47%) of the answers about the relocation process were positive and 54 (53%) negative. Figure 14 shows the results. The result is similar as the one obtained for the total sample.

Figure 14. Percentage of people from the 27 de Octubre neighborhood with positive and negative attitudes about the relocation process (n = 116)
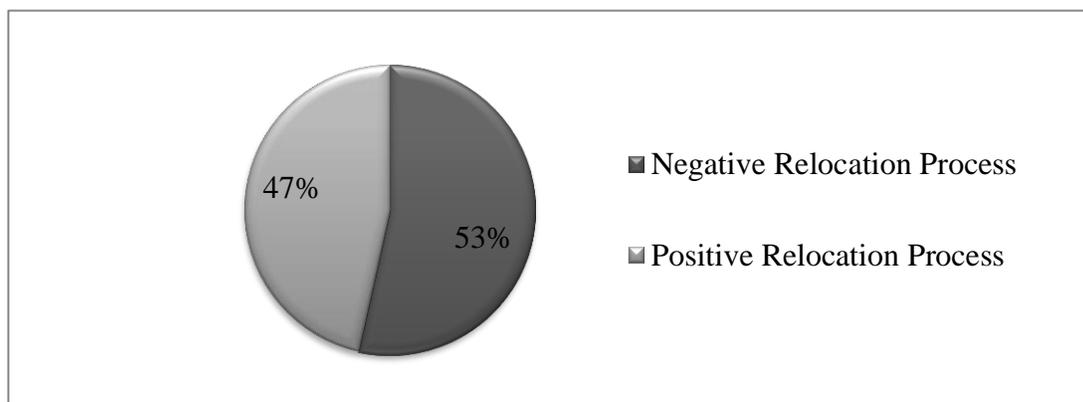
From next question, six groups of similar short phrases were identified, and four of them shared a negative perception. Table 9 shows the results.

Table 9. Absolute frequencies and percentages of the main issues highlighted by the residents of the 27 de Octubre neighborhood about the relocation process (n = 116)

Groups	Frequency	Percentage
Smooth Relocation Process	47	40.52%
Abuses in the Relocation Process	40	34.48%
Involuntary Relocation	32	27.59%
Lies and Scams of Authorities	17	14.66%
Safe Process	6	5.17%
Loss of Belongings	6	5.17%

Regarding the relocation process, the results from 27 de Octubre are similar to the results from the total sample. The most significant difference between both samples was that no more than five participants from the 27 de Octubre sample said that the relocation process was unsafe, while 18 participants from the total sample mentioned it.

In the third open-ended question, the opinions of the participants from 27 de Octubre were leaned to the dissatisfied side. The analysis showed that 75 (65%) participants were dissatisfied with their current life versus their life before relocation and 41 (35%) said otherwise (see figure 15). It can be noted that the sample of the residents of this neighborhood was more satisfied compared with the results of the total sample.

Figure 15. Percentage of people from the 27 de Octubre neighborhood satisfied or dissatisfied with their current way of living compared to life before relocation (n = 116)
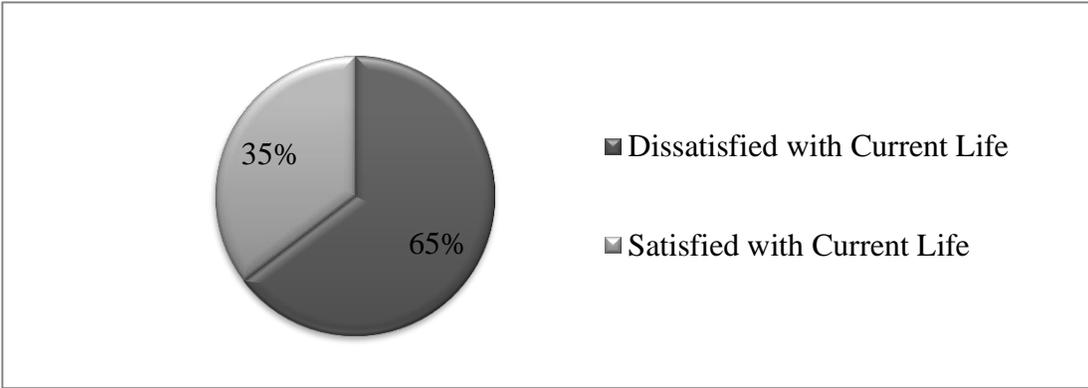
From the next question, ten groups of similar short phrases were identified. The top three complaints were: crime, having a better life before relocation and the size of the house. Nine groups noted negative situations in their current life compared to life before relocation and twelve participants said that they are living better after being relocated (see table 10).

Table 10. Absolute frequencies and percentages of the main issues highlighted by residents of the 27 de Octubre neighborhood about their current way of living compared to life before being relocated (n=116)

Groups	Frequency	Percentage
Crime	32	27.59%
Life Better Before	26	22.41%
Size of House	21	18.10%
Dishonesty	17	14.66%
Uncomfortable, Awful	16	13.79%
Life Better Now	12	10.34%
Unpleasant Place	10	8.62%
Neighbor Issues	10	8.62%
Pollution	7	6.03%
Utility Issues	5	4.31%

Overall, the analysis found that the relocation process and the current living conditions did not meet the expectations of the people of 27 de Octubre.

In terms of the opinion about the current life versus the life before being relocated, there was a difference between the results from the total sample and 27 de Octubre. Residents of this neighborhood were more satisfied with their current life compared to the total

sample. Furthermore, there was variation in the hierarchy of the groups identified in the content analysis. Although the top three groups were the same in both samples, in the total sample the size of the new houses was the main problem, while for the residents of this neighborhood the crime rate was in the foreground.

5.3.1.3. Content analysis for the Ciudad Bicentenario neighborhood sample

According to the content analysis for Ciudad Bicentenario (n2=150), 65 of the answers (43%) about the relocation process were classified as positive and 85 (57%) were classified as negative. Figure 16 shows the results.

Figure 16. Percentage of people from the Ciudad Bicentenario neighborhood with positive and negative attitude about the relocation process (n = 150)
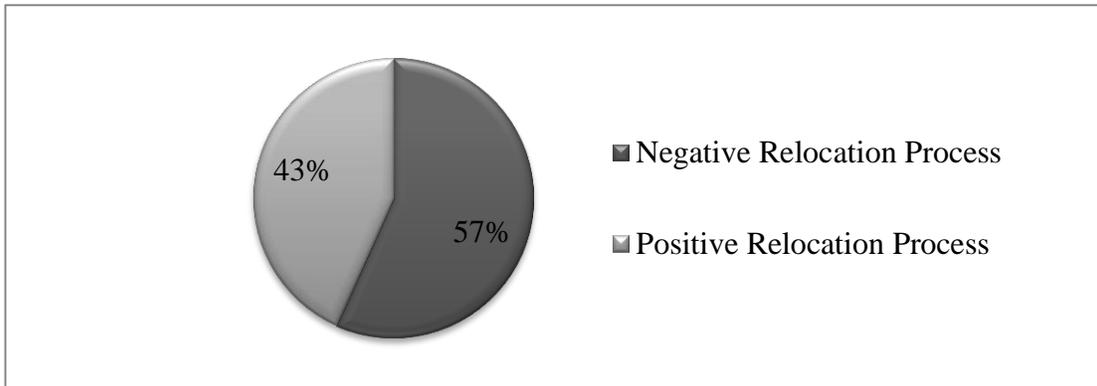
From the next question, seven groups of similar short phrases were identified and five of them shared a negative perception (see table 11).

Table 11. Absolute frequencies and percentages of the main issues highlighted by the residents of the Ciudad Bicentenario neighborhood about the relocation process (n = 150)

Groups	Frequency	Percentage
Abuses in the Relocation Process	69	46.00%
Smooth Relocation Process	59	39.33%
Involuntary Relocation	23	15.33%
Unsafe Process	16	10.67%
Loss of Belongings	9	6.00%
Lies and Scams of Authorities	7	4.67%
Safe Process	6	4.00%

The results from this neighborhood were virtually identical to the results from the total sample and the hierarchy of the identified groups was practically the same. Both samples shared the same top three groups and from the other four groups only the Lies and Scams of Authorities group had a higher hierarchical position in the total sample.

In the third open-ended question, 149 respondents (99%) indicated they were dissatisfied with their current life (see figure 17).

Figure 17. Percentage of people from the Ciudad Bicentenario neighborhood satisfied or
dissatisfied with their current way of living compared to life before relocation (n = 150)
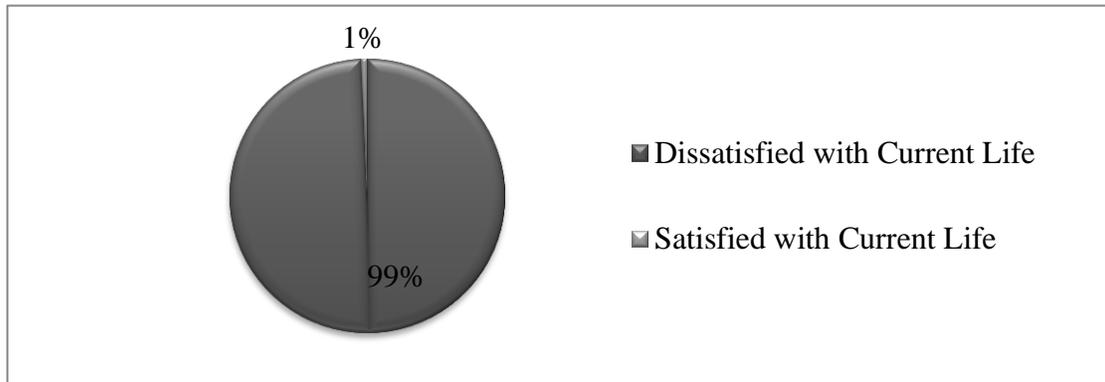
From the next question, ten groups of similar short phrases were identified. The top three

complaints were: the size of the house, pollution, and having a better life before

relocation. The main distinguishing feature is that all the groups noted a negative

situation in their current way of life compared to life before being relocation (see table

12).

Table 12. Absolute frequencies and percentages of the main issues highlighted by residents of the Ciudad Bicentenario neighborhood about their current way of living compared to life before relocation (n=150)

Groups	Frequency	Percentage
Size of House	79	52.67%
Pollution	54	36.00%
Life Better Before	43	28.67%
Crime	34	22.67%
Dishonesty	20	13.33%
Depression	18	12.00%
Utility Issues	18	12.00%
Unpleasant Place	15	10.00%
Neighbor Issues	15	10.00%
Uncomfortable, Awful	11	7.33%

In terms of satisfaction with their current life compared to life before relocation, a difference exists between the results from the total sample versus the results from Ciudad Bicentenario. In this neighborhood, less than 1% of the sample was satisfied with their current life versus 16% from the total sample. This suggests that dissatisfaction with the current life was more accentuated at Ciudad Bicentenario. Furthermore, all the identified groups, from this sample, noted negative conditions about the new location and their hierarchical positions were different from the total sample. However, among the first three groups, both samples agreed that the size of the house and life better before being relocated were the main problems.

A comparison between the results of both neighborhoods found that the same percentage (40%) of participants in both neighborhoods said that the relocation process was smooth. But in general, the participants from Ciudad Bicentenario showed a worse perception,

because 46% of the participants said that they suffered mistreatment or abuse during relocation versus 34% from 27 de Octubre. Furthermore, less than 1% of the participants from Ciudad Bicentenario were satisfied with their current life compared to 35% of 27 de Octubre respondents. Nevertheless, both neighborhoods agreed on the size of the house, life better before, and crime as the main issues. A noticeable difference between both neighborhoods was that 52% of participants of Ciudad Bicentenario said that the size of the house was a problem compared to 18% of 27 de Octubre respondents. Nobody from Ciudad Bicentenario said that life was better after being relocated while 10% of 27 de Octubre residents said that they are living better now than before being relocated. Pollution is another feature with a large difference between both neighborhoods. The Ciudad Bicentenario residents most frequently mentioned this problem (36% versus 6%).

Although the content analysis did not mention the distance between both neighborhoods and the city downtown, it could be a latent variable expressed as a higher crime rate, failure of sewer utilities or garbage collection issues (pollution) because people from 27 de Octubre, which is closer to downtown, are seen themselves in a better condition than people from Ciudad Bicentenario.

In summary, the content analysis reveals that people from both neighborhoods share a common opinion: they perceive that the authorities failed in the promise to give them a better QoL, although they are now living in a flood-free area.

5.3.2. Analysis of the subjective quality of life before and after being relocated

The analysis in this section addressed subjective QoL using the Likert scale format. The survey asked the participants about their QoL in two scenarios: before being relocated (henceforth called BBR) and after being relocated (henceforth called ABR). The total sample was analyzed as a whole and then each neighborhood was analyzed independently.

5.3.2.1. Total sample

First, the analysis focused on the survey question 2 (see table 13). This question gave an overview of the participants' perception regarding their QoL in both scenarios. The statistical analysis compared their means.

Table 13. Question 2 from the survey

2. How do you rate your quality of life? Before and After Relocation.

| **Before** | O Very good O Good O Neither good nor bad O Bad O Very bad O No answer |
| **After** | O Very good O Good O Neither good nor bad O Bad O Very bad O No answer |

The Mann-Whitney U test was conducted to evaluate the null hypothesis that there is not a relationship between where people live before and after being relocated and QoL

(n=266). Preliminary analysis (Shapiro-Wilk's test) and a visual inspection of the histograms (see figure 18), normal Q-Q plots and box plots showed that the sample data were not approximately normally distributed for either scenario, with a skewness of 0.667 (SE = 0.149) and a kurtosis of -2.152 (SE = 0.298) for the BBR and a skewness of -1.385 (SE = 0.149) and a kurtosis of 2.295 (SE = 0.298) for the ABR. The non-parametric Levene's test was used to verify the equality of variances in the samples and it showed that the samples did fit the assumption of homogeneity of variances. According to the Mann-Whitney U test, there was significant evidence to reject the null hypothesis, therefore, it was concluded that there was a significant difference between the people's QoL before and after being relocated. The descriptive statistics showed a larger mean score for the ABR scenario; according to the Likert scale used, it means a worse perceived QoL.

Figure 18. Sample distribution about the QoL before and after being relocated
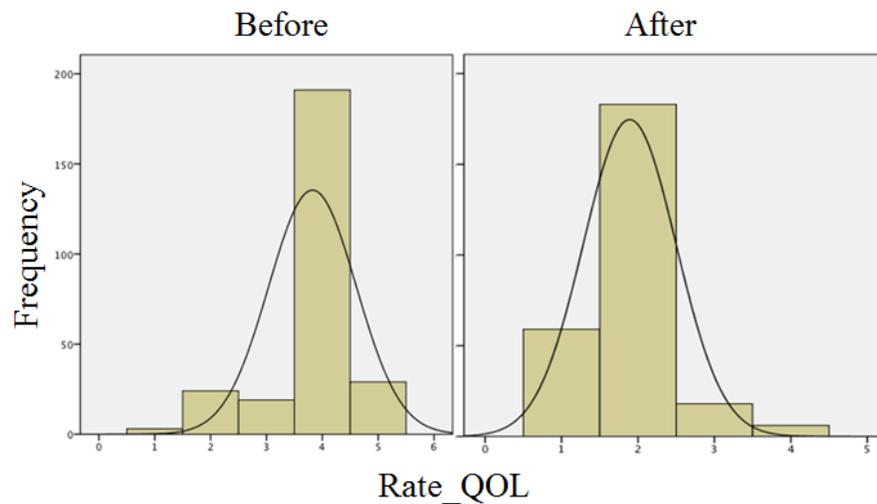
Then, 28 questions distributed across three different dimensions (social, economic and environmental) were analyzed. These 28 questions assessed specific characteristics of subjective QoL before and after being relocated. Table 14 shows the measured variables in each question. The variables were recorded with the same Likert scale used in survey question two.

Table 14. The three dimensions and their variables

	DIMENSIONS		
	Social	Economic	Environmental
VARIABLES	1. Safety 2. Pub trans 3. Distance to work 4. Distance to health center 5. Distance to school 6. Roads 7. Police 8. Health center service 9. School quality 10. Social group integration 11. Neighbors relationship	1. House size 2. Property size 3. Number of bedrooms 4. Number of bathrooms 5. Tap water 6. Sewer 7. Home floor 8. Home roof 9. Income 10. Debt 11. Job	1. Existence of green areas 2. Condition of green areas 3. Garbage collection 4. Air pollution 5. Sonic contamination 6. Graffiti

The 28 variables were tested for normality and homogeneity of variances. Then, the means from each variable of both scenarios (BBR and ABR) were compared, using the appropriate statistical test, to evaluate the null hypothesis; that there is not a relationship between where people live, before and after being relocated, and QoL. None of the 28 variables showed a normal distribution (Shapiro-Wilk's test) for either of the two

scenarios. All the skewness and kurtosis values were out of the normality rank. The non-parametric Levene's test showed that 7 variables (quality of schools, social group integration, neighbors' relationship, size of the house, property size, number of bathrooms and income) did fit the assumption of homogeneity of variances. The means of these 7 variables in both scenarios were compared with the Mann-Whitney U test and the means of the other 21 variables were compared using the t-test (equal variances not assumed). The Mann-Whitney U test showed significant evidence to reject the null hypothesis for the 7 variables and conclude that there was a difference between both scenarios (BBR and ABR). The descriptive statistics showed larger means scores for all 7 variables at ABR. The t-test (equal variances not assumed) compared the means of the remaining 21 variables, and there was significant evidence to say that they all were different. Therefore, it can be concluded that there was a difference between each variable in both scenarios. All variables except for graffiti show a better condition for the BBR scenario. The result for graffiti can be explained by the fact that an older neighborhood is more likely to show expressions of graffiti (see table 15).

From table 15, the differences between the values of each variable were divided in quartiles to identify which dimension (economic, social or environmental) shows a larger difference between the two scenarios (see table 16). The economic dimension contained 4 of the variables in the first quartile and 7 variables (50%) from the first two quartiles. This indicates that this dimension was the one with the greatest difference between the two neighborhoods.

Table 15. Comparison of means or rank means* before and after being relocated indicating the *p*-value (sig.) and the statistical test used for the total sample

Variables	Before	After	Sig/test
	Total Sample (two neighborhoods) (n = 266)		
Overall QOL	149.81	383.19	.000(A)
Social dimension			
Safety	3.10	4.05	.000 (B)
Public transportation	2.63	3.22	.000 (B)
Distance to work	2.27	3.47	.000 (B)
Distance to health center	2.44	3.36	.000 (B)
Distance to school	2.23	2.52	.000 (B)
Roads conditions	2.09	3.06	.000 (B)
Police	3.40	4.03	.000 (B)
Health center service	2.84	3.30	.000 (B)
School quality	242.61	290.39	.000 (A)
Social group integration	248.95	284.05	.003 (A)
Neighbors relationship	228.46	304.54	.000 (A)
Economic dimension			
House size	142.67	390.33	.000 (A)
Property size	141.84	391.16	.000 (A)
Number of bedrooms	2.39	3.08	.000 (B)
Number of bathrooms	230.13	302.87	.000 (A)
Tap water	2.30	3.32	.000 (B)
Sewer	2.36	3.32	.000 (B)
Home floor	2.21	2.71	.000 (B)
Home roof	2.19	2.72	.000 (B)
Income	188.14	344.86	.000 (A)
Debt	2.23	3.03	.000 (B)
Job	2.19	2.48	.000 (B)
Environmental dimension			
Existence of green areas	2.77	3.52	.000 (B)
Condition of green areas	2.84	3.57	.000 (B)
Garbage collection	3.04	3.53	.000 (B)
Air pollution	3.31	3.62	.000 (B)
Sonic contamination (noise)	3.73	3.91	.000 (B)
Graffiti	2.59	2.21	.000 (B)

(A) Mann-Whitney U test; (B) t-test (equal variances not assumed); *The Mann-Whitney U test compares rank means.

Table 16. Difference between the means of the 28 variables classified by quartiles

	Difference	Variable	Dimension
1	-1.906	Sq_Mts_L	Economic
2	-1.850	Sq_Mts_H	Economic
3	-1.199	Dist_Work	Social
4	-1.026	Tap_Water	Economic
5	-0.962	Road_Con	Social
6	-0.962	Sewer	Economic
7	-0.951	Safety	Social
8	-0.925	Dist_HC	Social
9	-0.805	Debt	Economic
10	-0.744	Green_Areas	Environmental
11	-0.729	Cond_GA	Environmental
12	-0.692	No_Bed	Economic
13	-0.692	Income	Economic
14	-0.624	Police	Social
15	-0.590	Trans	Social
16	-0.526	Roof	Economic
17	-0.500	Floor	Economic
18	-0.492	Garb_Colec	Environmental
19	-0.470	Relat_Neigh	Social
20	-0.466	Serc_HC	Social
21	*0.380*	Graffiti	Environmental
22	-0.316	No_Bath	Economic
23	-0.312	Air_Pollu	Environmental
24	-0.293	Dist_Sch	Social
25	-0.286	Job	Economic
26	-0.203	Quality_Sch	Social
27	-0.177	Noise	Environmental
28	-0.173	Part_Groups	Social

Next, the statistical analysis was carried out for each neighborhood, in the same way as for the total sample.

5.3.2.2. 27 de Octubre neighborhood

Data from the overall question about QoL were not approximately normally distributed for either scenario, with a skewness of .714 (SE = .225) and a kurtosis of .504 (SE = .446) for the BBR and a skewness of -.599 (SE = .225) and a kurtosis of -.482 (SE = .446) for the ABR. The t-test (equal variances not assumed) showed evidence to conclude that there was a significant difference between the people's QoL from both scenarios with a larger mean score for the ABR (see first row in table 17).

In terms of the 28 variables of both scenarios, the results were as follows: the t-test showed that transportation was statistically different between both scenarios with a mean score larger in the ABR. The t-test (equal variances not assumed) showed that 10 variables (safety, distance to work, police, number of bedrooms, income, presence of green areas, condition of green areas, garbage collection, noise and graffiti) were statistically different between both scenarios and distance to school was not statistically different between the two scenarios. Among the variables that showed a significant difference, only graffiti was better evaluated in the BBR. The remaining 16 variables were analyzed using the Mann-Whitney U test. The results showed that 4 variables (road conditions, quality of schools, social integration and number of bathrooms) were statistically equal between both scenarios and 12 variables (distance to health center, services at health center, relationship with neighbors, size of house, size of property, tap water, sewer, floor, roof, debt, job and air pollution) were statistically different between

both scenarios. From the 16 variables, all the means scores but school quality were larger for the ABR (see table 17).

The results showed that the social dimension had the lowest variation, since 4 of its variables showed no significant difference between both scenarios. Moreover, graffiti has the same behavior as for the total sample.

5.3.2.3. Ciudad Bicentenario neighborhood

Data from the overall question about QoL were not approximately normally distributed for either scenario, with a skewness of -.149 (SE = .198) and a kurtosis of 4.115 (SE = .394) for the BBR and a skewness of -.938 (SE = .198) and a kurtosis of 11.492 (SE = .394) for the ABR. The t-test (equal variances not assumed) showed evidence to conclude that there was a significant difference between the people's QoL from both scenarios with a larger mean score for the ABR (see first row in table 18).

In terms of the 28 variables of both scenarios, the results were as follows: the Mann-Whitney U test showed that health center service, social group integration and relationship with neighbors were statistically different between the two scenarios with mean scores larger in the ABR. The t-test (equal variances not assumed) showed that the remaining 25 variables were statistically different between the scenarios. From the 25 variables, the entire mean scores but graffiti were larger for the ABR (see table 18).

Table 17. Comparison of means or rank means* before and after being relocated
indicating the p-value (sig.) and the statistical test used for 27 de Octubre

Variables	27 de Octubre (n = 116)		
	Before	After	Sig/test
Overall QOL	1.92	3.53	.000 (B)
Social dimension			
Safety	2.98	4.03	.000 (B)
Public transportation	2.57	3.41	.000 (C)
Distance to work	2.27	3.61	.000 (B)
Distance to health center	73.48	159.52	.000 (A)
Distance to school	2.12	2.15	**.715** (B)
Roads conditions	115.54	117.46	**.736** (A)
Police	3.32	4.05	.000 (B)
Health center service	85.5	147.5	.000 (A)
Schools quality	117.98	115.02	**.660** (A)
Social group integration	116.40	116.60	**.980** (A)
Neighbors relationship	106.71	126.29	.018 (A)
Economic dimension			
House size	68.14	164.86	.000 (A)
Property size	67.07	165.93	.000 (A)
Number of bedrooms	2.71	3.01	.000 (B)
Number of bathrooms	112.60	120.40	**.255 (A)**
Tap water	68.03	164.97	.000 (A)
Sewer	71.91	161.09	.000 (A)
Home floor	82.48	150.52	.000 (A)
Home roof	79.40	153.60	.000 (A)
Income	2.39	3.02	.000 (B)
Debt	92.78	140.22	.000 (A)
Job	105.98	127.02	.008 (A)
Environmental dimension			
Existence of green areas	2.52	3.03	.000 (B)
Condition of green areas	2.57	3.13	.000 (B)
Garbage collection	2.70	2.88	.031 (B)
Air pollution	106.66	126.34	.013 (A)
Sonic contamination (noise)	3.54	3.76	.016 (B)
Graffiti	2.59	2.27	.010 (B)

(A) Mann-Whitney U test; (B) t-test (equal variances not assumed); (C) t-test; *The Mann-Whitney U test compares rank means.

The results from this neighborhood were different from the whole sample results. All the variables, including graffiti, are statistically different and they all supported the BBR.

This indicates that discontent was more widespread at Ciudad Bicentenario than at 27 de Octubre.

Table 18. Comparison of means or rank means* before and after being relocated indicating the *p*-value (sig.) and the statistical test used Ciudad Bicentenario

Variables	Cd. Bicentenario (n = 150)		
	Before	After	Sig.
Overall QOL	1.87	4.05	.000 (B)
Social dimension			
Safety	3.19	4.06	.000 (B)
Public transportation	2.67	3.07	.000 (B)
Distance to work	2.28	3.37	.000 (B)
Distance to health center	2.49	3.20	.000 (B)
Distance to school	2.31	2.81	.000 (B)
Roads conditions	2.06	3.75	.000 (B)
Police	3.47	4.01	.000 (B)
Health center service	134.52	166.48	.000 (A)
School quality	2.65	3.03	.000 (B)
Social group integration	130.95	170.05	.000 (A)
Neighbors relationship	121.99	179.01	.000 (A)
Economic dimension			
House size	1.99	4.04	.000 (B)
Property size	1.99	4.06	.000 (B)
Number of bedrooms	2.15	3.14	.000 (B)
Number of bathrooms	2.14	2.65	.000 (B)
Tap water	2.25	2.95	.000 (B)
Sewer	2.33	3.05	.000 (B)
Home floor	2.04	2.25	.000 (B)
Home roof	2.02	2.21	.000 (B)
Income	2.07	3.02	.000 (B)
Debt	2.07	3.02	.000 (B)
Job	2.05	2.37	.000 (B)
Environmental dimension			
Existence of green areas	2.97	3.89	.000 (B)
Condition of green areas	3.05	3.91	.000 (B)
Garbage collection	3.30	4.03	.000 (B)
Air pollution	3.32	3.69	.000 (B)
Sonic contamination (noise)	3.87	4.02	.001 (B)
Graffiti	2.60	2.71	.000 (B)

(A) Mann-Whitney U test; (B) t-test (equal variances not assumed); *The Mann-Whitney U test compares rank means.

In summary, and regarding the two neighborhoods, the analysis of the 28 variables did not show differences between the social, economic, and environmental dimensions; in all dimensions, the ABR was better. Thus, according to people's perceptions, their QoL was diminished after being relocated. A remarkable complaint was the size of new home. This complain may partly be due because relocatees did not have enough space to grow vegetables or raise animals as they previously could. Other issues were crime, transportation, and utilities. The difference in the subjective QoL between the two scenarios was statistically different for the overall sample and for each of the neighborhoods, as well.

5.3.3. Analysis of the current objective versus the current subjective QoL

This section explores the relationship between the current objective conditions in which relocatees live and their current subjective QoL. The analysis was divided into three parts: first, current objective QoL approach; second, current subjective QoL approach; and third, the relationship of both approaches.

5.3.3.1. The current objective QoL

The objective variables were examined using factor analysis (Principal Component Analysis or PCA). The research accounts for 34 objective variables, but not all of them qualified to be part of the PCA. Thirteen variables (presence of public transportation in the neighborhood, roads paved, presence of police, number of bathrooms, number of bedrooms, sewer, kind of floor in the house, kind of roof in the house, formal job, noise,

graffiti, owning a house and multistory building) were eliminated because they showed a low variability or were practically constants. Two more variables (distance to health center and square meters of house) were eliminated since they presented multicollinearity issues and presence of green areas and air pollution were excluded because they could not be objectively evaluated. Eventually, the PCA was performed with 17 variables, which are shown in table 19.

The Kaiser-Mayer-Olkin (KMO) statistic was .634 and the Bartlett's significance test was .000. This means that the data were suitable for PCA. Six factors or principal components with eigenvalues greater than 1 were extracted in this study.

Table 19 shows the six principal components that composed the underlying groups of objective QoL in both neighborhoods. These principal components explain 56.76% of the total variance in the data set. The first and second principal components explain 16.31% and 11.48% of the total variance, respectively, while the remaining principal components explain 6.03% − 8.36% of the variance. This indicates that the relative importance of these principal components is nearly equal and deleting any of them could result in loss of information.

Table 19. Factor loading matrix for objective QoL variables

Component Matrix[a]

VARIABLES	Component					
	1	2	3	4	5	6
Garbage collection	-.793					
Dwelling type	.771					
Tap water at home	.745					
Distance to school		.425				
Garage		.746				
Property size		.709				
Income		.508				
Social Groups			.576			
Distance to work			.475			
Use of open areas			.474			
Education			.411			
Family members			.366			
Stolen property				.431		
Local school attendance					-.598	
Health service					.562	
Friendship with neighbors					.484	
Debt						.672
Eigenvalue	2.772	1.952	1.421	1.267	1.211	1.026
Percentage of variance explained	16.31%	11.48%	8.36%	7.45%	7.12%	6.03%

Extraction method: principal component analysis
Rotation method: direct oblimin

The first principal component is highly correlated with three variables. It increases with the type of dwelling, tap water and the presence of garbage collection (recall that a high score for garbage collection is bad). The correlations between these three variables with the first principal components are similar. This suggests that households with better scores in these three variables tend to have better QoL. Agreeing with the classification of the variables established in this research, it can be seen that two of the variables,

within this component, correspond to the economic dimension and one to the environmental dimension.

The second principal component increases with four variables (distance to school, garage, property size, and income). The second principal component correlates more strongly with garage and property size. Indeed, it can be said that based on these correlations, .746 and .709 respectively, the second principal component is a measure of property features. This component corresponds to three economic variables and one social variable.

The third principal component strongly correlates with five variables. This principal component increases as the social group integration, distance to work, use of green areas, education, and family members increase. The third principal component correlates more strongly with the social group integration variable. However it is a component that has variables in three dimensions: economic, social and environmental.

The fourth principal component correlates with only one variable (stolen property). This component can be viewed as a measure of safety and it corresponds to the social dimension.

The fifth principal component correlates with three variables: local school attendance, health services, and friendship with neighbors. This principal component corresponds to the social dimension.

The sixth principal component correlates strongly and increases with debt. This principal component corresponds to the economic dimension.

Following the PCA, an objective QoL index was developed combining the scores of the six principal components. The overall objective score of each participant was obtained by weighting each principal component score by its respective variance as follows:

$$A = (16.31 \ F_1 + 11.48 \ F_2 + 8.36 \ F_3 + 7.45 \ F_4 + 7.11 \ F_5 + 6.03 \ F_6)/100 \qquad (7)$$

where A is the objective QoL score of each participant, and the F's represent the six principal components from the PCA.

The objective QoL scores, which were computed by using equation 7, ranged from a minimum of 8.55 and a maximum of 31.21. Two participants had considerably higher scores (outliers), so they were removed in order to narrow the range. By removing these two individuals, a new upper limit equal to 18.83 was settled and it resulted in a considerably narrower range (10.28). A smaller range allowed for greater differentiation between the scores from the participants. Once the minimum and maximum values were recognized, the minimum–maximum standardization method was applied to transform the scores into a one to five scale, which is the same scale used in the subjective questions. This transformation allowed for setting the relationship between the

subjective and objective variables and helped to create an overall QoL index by adding their scores. It is worth mentioning that a lower score represents a better QoL.

5.3.3.2. The current subjective quality of life

Table 20 shows the results of the general question about QoL after relocation. The participants answered the question: how do you rate your quality of life after being relocated? Their opinions were collected using the same Likert scale that was used previously. A low percentage (10.2%) of respondents expressed some level of satisfaction, while 82.7% said that they had a bad or very bad QoL after relocation.

Table 20. Percentage of respondents from the total sample by perception on their overall QoL (n=266)

Subjective QoL	Overall QoL	
	Percentage (%)	Cumulative (%)
Very good	1.1	1.1
Good	9.1	10.2
Neither good nor bad	7.1	17.3
Bad	71.8	89.1
Very bad	10.9	100.0
Total	100.0	
Mean (Likert)	3.82	
Mode (Likert)	4	
Standard deviation	.748	

Furthermore, figure 19 shows the cumulative percentages of the "indifferent", "good" and "very good" responses to the 28 questions. On the one hand, the variables with the lowest cumulative percentages were safety and size of houses. On the other hand, more than 60% of the respondents did not complain about their income, health services or education facilities, which are typically some of the most important measures of QoL (Soubbotina, 2004). Appendix E shows the results, as in table 20, for each of the 28 variables.

Analyzing figure 19 and giving the same importance or weight to each of the three dimensions (social, economic and environmental), it could be said that the upper quartile, which includes the variables with lowest cumulative percentages with an "indifferent", "good" or "very good" opinion was led by the environmental dimension. This means that the participants did not have a "good" opinion about their environmental situation at their new location. On the other hand, the economic dimension led the lowest two quartiles, which include the variables with highest cumulative percentages. This means that the participants' opinions about their economic conditions were better than their opinions of the other two dimensions.

Figure 19. Cumulative percentage of respondents with an indifferent, good or very good opinion on the 28 subjective variables

Variable	Percentage
Presence of police	4.50
Safety	5.30
Sq mts land	9.00
Sq mts home	10.20
Noise	13.50
Air pollution	36.80
Garbage collection	40.60
Conditions of green areas	41.70
Existance of green areas	44.70
Distance to work	48.50
Roads conditions	59.40
Relationship with neighboors	63.20
Sewer	65.00
Distance to health center	65.80
Tap water	66.90
Heath center services	69.10
Paticipation in groups	69.90
Transportation	75.90
Roof	79.70
Floor	82.00
Debt	82.00
No of bedrooms	85.70
Income	88.30
Quality of schools	89.80
Graffiti	92.90
Job	93.60
Distance to school	94.70
No of bathrooms	95.50

Further, an overall subjective QoL was calculated. The assessments of each participant (n=266) in the 28 variables were added, and the average score was calculated for each participant. Then the 266 average scores of each participant were added and the overall average was calculated. At the end, a subjective QoL average score equal to 3.23 was

obtained. It is worth noting that according to the used Likert scale, this score leans toward a poor QoL.

5.3.3.3. Relationship between the current objective and subjective quality of life

Comparing the average scores of all the subjective versus all the objective variables, the former has a larger mean (3.23) than the latter (2.96). At first glance, the objective variables seem to be better positioned than the subjective variables. However, the data were analyzed to see if the difference between these scores was statistically significant.

The data were not approximately normally distributed for either sample, with a skewness of .753 (SE = .149) and a kurtosis of 5.730 (SE = .298) for the subjective variables and a skewness of -.085 (SE = .149) and a kurtosis of -.938 (SE = .298) for the objective variables. The t-test (equal variances not assumed) showed that there was a significant difference between the subjective and objective variables. Since the score of the objective variables was the lowest, it can be said that the people perceive a statistically different and worse QoL than the one from the objective approach.

The overall QoL could be categorized as: well-being, deprivation, adaptation, or dissonance based on the subjective and objective scores. In order to choose any of the four categories, a breakpoint (brake score) according with the scale used must be set (Tesfazghi et al., 2009). For purposes of this research, a 3.0 score was selected as the breakpoint because it is the middle point of the Likert scale used. Participants who chose

a score below the breakpoint did not complain about their QoL and those who chose a score higher than the breakpoint did complain about their QoL.

By applying the above criteria, the mean scores obtained from the total sample confirmed that the subjective and objective characteristics did not match. Since the objective variables showed a QoL score lower than 3.00 (2.96 < 3.00) and the subjective showed a QoL score greater than 3.00 (3.23 > 3.00), it could be said that in terms of QoL there was a dissonance condition in the study area. This condition means there was "lack of agreement" between people and their surroundings and, at least with the current conditions, there was no hope that they could adapt to their new environment. The lack of agreement is not surprising, given that it has been documented that subjective and objective QoL do not frequently match (Cummins, 2000). This situation could occur because people do not appreciate or do not take advantage of their surroundings. For example, the fact that there is an elementary school would not bring any benefit to people who do not have children.

5.3.4. Analysis of the overall quality of life of by neighborhood

This part of the research analyzed the relationship between the current QoL measures from both neighborhoods. The analysis divided the sample into four groups (see table 21). This allocation allowed, likewise, the analysis of the subjective and objective variables, independently, of each neighborhood.

Table 21. Different groups of variables to be compared			
I. 27 de Octubre neighborhood Subjective variables	Vs.	III. Ciudad Bicentenario neighborhood Subjective variables	
II. 27 de Octubre neighborhood Objective variables	Vs.	IV. Ciudad Bicentenario neighborhood Objective variables	

5.3.4.1. Comparison of subjective quality of life between both neighborhoods

This section compares the subjective variables between both neighborhoods. The t-test (equal variances not assumed) showed that six variables (safety, police, social integration, debt, air pollution and graffiti) were not statistically different between both neighborhoods and 14 variables were statistically different between the neighborhoods. From these 14 variables, six (roads condition, quality of schools, sq mts of housing, sq mts of property, garbage collection and noise) were better off at 27 de Octubre and eight (transport, distance to work, distance to health center, health center services, number of bathrooms, tap water, roof, and job) were better off at Ciudad Bicentenario.

The Mann-Whitney U test showed that two variables were not statistically different between the neighborhoods (relationship with neighbor and number of bathrooms) and six variables did show a statistical difference. Three of them (distance to school, presence of green areas and condition of green areas) were better off at 27 de Octubre and the other three (distance to school, presence of green areas and conditions of green areas) were better off at Ciudad Bicentenario (see table 22).

Table 22. Comparison of means or rank means* of 28 subjective variables of both neighborhoods after relocation, indicating the *p*-value (sig.) and the statistical test used

Variables	27 de Octubre (n = 116)	Ciudad Bicentenario (n = 150)	Sig	test
Social dimension				
Safety/Stolen Property	4.03	4.06	**.632**	(B)
Public transportation	3.41	3.07+	.000	(B)
Dist. to work	3.61	3.37+	.034	(B)
Dist. to health center	3.57	3.20+	.000	(B)
Dist. to school	90.68+	166.62	.000	(A)
Road conditions	2.16+	3.75	.000	(B)
Police	4.05	4.01	**.339**	(B)
Health center service	3.51	3.15+	.000	(B)
School quality	2.22+	3.03	.000	(B)
Social group integration	2.22	3.15	**.504**	(B)
Neighbors relationship	127.86	138.63	**.242**	(A)
Economic dimension				
House size	3.79+	4.04	.001	(B)
Property size	3.87+	4.06	.013	(B)
Number of bedrooms	126.86	138.63	**.088**	(A)
Number of bathrooms	2.80	2.65+	.030	(B)
Tap water	3.81	2.95+	.000	(B)
Sewer	174.89	101.49+	.000	(A)
Home floor	187.47	91.76+	.000	(A)
Home roof	3.37	2.21+	.000	(B)
Income	146.45	123.48+	.003	(A)
Debt	3.04	2.04	**.805**	(B)
Job	2.62+	2.37	.002	(B)
Environmental dimension				
Existence of green areas	80.41+	174.56	.000	(A)
Condition of green areas	83.92+	171.84	.000	(A)
Garbage collection	2.88+	4.03	.000	(B)
Air pollution	3.53+	3.69	.049	(B)
Sonic contamination (noise)	3.76+	4.02	.000	(B)
Graffiti	2.27	2.17	**.273**	(B)

*The Mann-Whitney U test compares rank means. Abbreviations: (A) Mann-Whitney U Test. (B) t-test (equal variances not assumed). (C) t-test. Numbers in BOLD font show significance level *p* >.05. (L) The variables were measured using a 5-point Likert scale (1 = Very Good, 2 = Good, 3 = Neither Good Nor Bad, 4 = Bad, 5 = Very Bad). +Stand for the best condition p > .05

According to the results, there was no absolute trend about which neighborhood is better off in terms of subjectivity. Nine variables were better evaluated at 27 de Octubre, 11 were better evaluated at Ciudad Bicentenario and eight were equally evaluated between both neighborhoods (see table 23). However, the social and economic dimensions were

better off at Ciudad Bicentenario while in 27 de Octubre, the environmental dimension was in a better position.

Table 23. Variables that were in better subjective condition by neighborhood

27 de Octubre	Equal Condition	Ciudad Bicentenario
Roads condition	Safety	Transport
Quality of schools	Police	Distance to work
Sq mts of housing	Social integration	Distance to health center
Sq mts of property	Debt	Health center services
Garbage collection	Air pollution	Number of bathrooms
Noise	Graffiti	Tap water
Distance to school	Relationship with neighbor	Roof
Presence of green areas	Number of bedrooms	Job
Condition of green areas		Sewer
		Floor
		Income

5.3.4.2. Comparison of the objective quality of life between both neighborhoods

This section compared the objective variables between both neighborhoods. The results (see table 24) showed that there were four constant variables in both neighborhoods (transportation, police, house floor and house roof). Seven variables did not show a significant difference between neighborhoods (stolen property, distance to school, roads paved, number of bedrooms, sewer, job and graffiti) and 17 variables did show significant difference. Six of them were better off at 27 de Octubre (distance to health center, social group integration, neighbors friendship, existence of green areas, condition of green areas and garbage collection) and 11 were better off at Ciudad Bicentenario (distance to work, health center services, local school attendance, size of house, size of

property, number of bathrooms, tap water, income, debt, air pollution and sonic contamination).

Table 24. Comparison of means or rank means* between neighborhoods about the presence of 28 objective variables, indicating the *p*-value (sig.) and the statistical test used

Variables	27 de Octubre (n = 116)		Ciudad Bicentenario (n = 150)		Sig/test
	Yes	No	Yes	No	
Social dimension					
Stolen Property (F)	28.4%	71.6%	38.7%	61.3%	**.082** (D)
Public transportation (F)	C O N S T A N T				
Dist. to work	44.48		41.37+		.000 (G)
Dist. to health center	3.36+		5.71		.001 (G)
Dist. to school	0.36		0.28		**.125** (G)
Roads paved (F)	98.3%	1.7%	100.0%	0.0%	**.189** (E)
Police (F)	C O N S T A N T				
Health center service (F)	74.1%	25.9%	84.0%	16.0% +	.047 (D)
Local school attendance (F)	70.7%	29.3%	86.0%	14.0% +	.002 (D)
Social group integration (F)	23.3%	76.7% +	13.3%	86.7%	.035 (D)
Neighbors friendship (F)	48.3%	51.7% +	32.0%	68.0%	.007 (D)
Economic dimension					
House size	27.60 sq mts		40.19 sq mts+		.000 (G)
Property size	54.47 sq mts		54.81 sq mts+		.000 (G)
Number of bedrooms	2.02		2.07		**.089** (G)
Number of bathrooms	1.00		1.03+		.000 (G)
Tap water	40.5%	59.5%	100.0%	0.0% +	.000 (D)
Sewer	96.6%	3.4%	97.3%	2.7%	**.732** (E)
Home floor (F)	CONSTANT				
Home roof (F)	CONSTANT				
Income	$3,211		$4,950+		.000 (G)
Debt	$3,453		$3,153+		.002 (G)
Job (F)	98.3%	1.7%	100.0%	0.0%	**.189** (E)
Environmental dimension					
Existence of green areas (F)	70.7%	29.3% +	14.0%	86.0%	.000 (D)
Condition of green areas (F)	26.7%	73.3% +	4.0%	96.0%	.000 (D)
Garbage collection (F)	99.1%	0.9% +	16.0%	84.0%	.000 (D)
Air pollution (F)	92.2%	7.8%	80.7%	19.3% +	.008 (D)
Sonic contamination (noise) (F)	94.0%	6.0%	98.7%	1.3% +	.044 (E)
Graffiti (F)	1.7%	98.3%	2.7%	97.3%	**.699** (E)

Abbreviations: (D) Chi-square test. (E) Fisher's exact test. (G) Kruskal-Wallis test. Numbers in BOLD font show significant difference level *p* >.05. (F) Binary variables with a coding scheme of 1 = Yes, 2 = No. +Stand for the best condition p > .05

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According to the results, there was no absolute trend about which neighborhood is objectively better off (see table 25). However, the economic dimension was better evaluated at Ciudad Bicentenario while the social and environmental dimensions were evaluated equally in both neighborhoods.

Table 25. Variables that were in better objective condition by neighborhood

27 de Octubre	Constant or Equal Condition	Ciudad Bicentenario
Distance to health center	Transportation	Distance to work
Social group integration	Police	Health center services
Neighbors friendship	Floor	Local school attendance
Existence of green areas	Roof	Size of house
Condition of green areas	Stolen property	Size of property
Garbage collection	Distance to school	Number of bathrooms
	Roads paved	Tap water
	Number of bedrooms	Income
	Sewer	Debt
	Job	Air pollution
	Graffiti	Sonic contamination

With the evidence shown above, which account for the results of the statistical analyses, it could be assumed that the conditions were different in both neighborhoods. Nevertheless, the results were inconclusive because they did not show which of the neighborhoods is better. However, a few findings can be noted. For instance, 27 de Octubre was better off in three variables: existence of green areas, condition of green areas and garbage collection. Likewise, Ciudad Bicentenario was better in 5 variables: distance to work, health center service, number of bathrooms, tap water, and income. On

the other hand, some variables appeared in only one of the neighborhoods, such as distance to school and friends with the neighbors. In this case, it could be said that the neighborhood where these variables appear was better off. Thus, up to this point, it can be concluded that the two neighborhoods were different in terms of overall QoL, but it cannot be concluded which one is in better condition.

5.3.4.3. Comparison of the overall QoL between both neighborhoods

In order to find, which neighborhood is better off, this study calculated the averages of the subjective and objective scores of each neighborhood to get a single overall average score per neighborhood and these averages were compared each other to see which neighborhood was better off.

The average score of the subjective and objective approaches for 27 de Octubre was equal to $(3.21 + 2.66)/2 = 2.94$ and the average of Ciudad Bicentenario was equal to $(3.25 + 3.20)/2 = 3.23$. These results mean that people from 27 de Octubre live in a dissonance condition and people from Ciudad Bicentenario live in deprivation (Craglia, Leontidou, Nuvolati, & Schweikart, 2004). Furthermore, a t-test was performed to assess whether the two neighborhoods were statistically equal.

The data (n=266) were not approximately normally distributed for either approach, with a skewness of -1.175 (SE = .160) and a kurtosis of 1.060 (SE = .318) for the overall QoL at 27 de Octubre and a skewness of -.578 (SE = .141) and a kurtosis of -.596 (SE = .281) for the overall QoL at Ciudad Bicentenario. The t-test showed that there was a

significant difference between the overall QoL scores of 27 de Octubre and Ciudad Bicentenario. Since the average score of 27 de Octubre was lower than the average score of Ciudad Bicentenario, it could be said that the overall QoL was better at 27 de Octubre. This difference is due to many factors. Although the residential density is higher in 27 de Octubre, the median of persons per household is lower. This fact confirms the opinion expressed by the participants, where those of 27 de Octubre have a better opinion about the size of their properties than the participants from Ciudad Bicentenario. Moreover, the garbage collection service was better evaluated in 27 de Octubre. This result could partly confirm that urban services are more available in the neighborhood that is closer to the urban area, which would confirm the third hypothesis. However, the opinion about the security services are not statistically different between the two neighborhoods, this result does not support the third hypothesis. Furthermore the opinions about jobs and health services were better assessed at Ciudad Bicentenario; these results contravene the third hypothesis. Because the results obtained, it cannot be confirmed the third hypothesis, as there are many differences between the two neighborhoods, some in favor of one neighborhood and some others against it. The fact that the closer neighborhood to an urban area (27 de Octubre) holds a better overall QoL is because the average of all the variables measured is lower (recall that a lower score means better condition according with the Likert scale used).

6. CONCLUSIONS

The following discussion adds on the comments presented in section five and concludes about the impact of relocation on people's QoL. The relocation project does impact, in a negative manner, the QoL of the relocated people. According with the opinions expressed by, approximately 50% of relocatees, the process to move from one place to another was full of issues. The main complaint was about the way they were treated by the authorities during the move. It seems that the authorities did not treat fairly and on an equal basis all the people, because the other half of the participants said that the move was good and without a major incident. The main problem that the relocatees have is not the process of moving by itself; the main concern is the way that they are currently living versus the way they used to live. The most important issues that are affecting the resettled people are the size of houses, crime rate and pollution problems, especially with the garbage collection service. It can be seen that the three main complaints are related with the three dimensions under study: economic, social and environmental.

Next, the conclusions addressed the facts that affected the total sample and each neighborhood. First, the total sample is approached in order to conclude regardless of the place relocatees live, and then, conclusions about each neighborhood are discussed.

6.1. The total sample

The open-ended questions do not show that the opinions expressed by the total of the participants (n=266) have a trend about the relocation process. The opinions are divided between those who think that the relocation process was adequate and those who had problems, 45% and 55% respectively. The following up question suggests that the participants who felt that this process was not adequate were those most likely to express their complaints; therefore the analysis found more negative comments than positive ones. This trait impacts the analysis, causing it to lean to the negative side of the relocation process. The complaints mentioned most often were abuses during the relocation process and involuntary relocation. Furthermore, a third open-ended question showed that 84% of the relocatees are not satisfied with their current life. The main issues that they mentioned were the size of the house, the higher crime rate, pollution, and the dishonesty of the authorities that managed the relocation process. The current houses are smaller; hence, they cannot raise small animals or grow vegetables as they used to do in their former location. This problem causes their economic deterioration. The crime rate creates an atmosphere of insecurity in the community, which brings social problems. Pollution, mainly due to the lack of garbage collection, is an environmental problem mentioned frequently. Another complaint is about the dishonesty of the authorities; the relocated people felt deceived by the authorities because they failed to give them a better place to live.

Regarding the overall QoL, recorded in a Likert scale, people said that their life is worse off in their new place and it is statistically different compared to where they lived before the relocation process. Moreover, the 28 following closed-ended questions led to conclude that the QoL was perceived better prior to the relocation. All variables in the three dimensions, except for graffiti, were best assessed for the before being relocated scenario and all of the variables showed a statistically significant difference between scenarios.

Regarding the current QoL, it was observed that the objective conditions were better evaluated than the subjective conditions and there was a statistically significant difference between them. According with the mean scores obtained from the objective and subjective QoL, it can be concluded that the relocated people are not comfortable with the conditions in which they actually live, however, these conditions are in better shape than they think (dissonance condition).

6.2. The 27 de Octubre neighborhood

Next, the analysis of the 27 de Octubre sample (n=116) showed that the opinions about the relocation process were divided between those who did not experienced problems during the relocation process and those who had problems, 47% and 53% respectively. The following up question showed that the most frequently mentioned complaints were abuses during the relocation process and involuntary relocation. Furthermore, a third open-ended question showed that 65% of the relocatees are not satisfied with their current life. The main issues that they mentioned were the higher crime rate, the life was

better before relocation, size of the house, and the dishonesty of the authorities that managed the relocation process. The behavior of the participants from 27 de Octubre was very similar to the total sample and their complaints and comments are alike.

Regarding the overall QoL, recorded in a Likert scale, people said that their life is worse off in their new place and it is statistically different compared to where they lived before the relocation process. Moreover, the 28 following closed-ended questions led to conclude that the QoL was perceived better in the place where they used to live before the relocation. All variables in the three dimensions, except for graffiti, were best assessed for the before being relocated scenario and 23 of the variables showed a statistically significant difference between their former and current living place. The variables that did not show a statistically significant difference were: distance to school, roads conditions, school quality, and social group integration, from the social dimension: and number of bathrooms from the economic dimension.

Regarding the current QoL, it was observed that the objective conditions were better evaluated than the subjective conditions According with the mean scores obtained from the objective and subjective QoL, it can be concluded that the relocated people are not comfortable with the conditions in which they actually live, however, these conditions are in better shape than they think (dissonance condition).

6.3. The Ciudad Bicentenario neighborhood

The analysis of the Ciudad Bicentenario sample (n=150) showed that the opinions about the relocation process were divided between those who did not experienced problems during the relocation process and those who had problems, 43% and 57% respectively. The following up question showed that the most frequently mentioned complaints were abuses during the relocation process and involuntary relocation. Furthermore, a third open-ended question showed that 99% of the relocatees are not satisfied with their current life. The main issues that they mentioned were size of the house, pollution, the higher crime rate, and the dishonesty of the authorities that managed the relocation process. The behavior of the participants from Ciudad Bicentenario had the particularity that 149 out of 150 respondents were not satisfied with their current life, feature that was not present in 27 de Octubre.

Regarding the overall QoL, recorded in a Likert scale, people said that their life is worse off in their new place and it was statistically different compared to where they lived before the relocation process. Moreover, the 28 following closed-ended questions led to conclude that the QoL was perceived better, in the place where they used to live, prior to the relocation. All variables in the three dimensions, including graffiti, were best assessed for the before being relocated scenario and all of the variables showed a statistically significant difference between scenarios.

Regarding the current QoL, it was observed that the objective conditions were better evaluated than the subjective conditions. However, both scores were above the break

point, which means a bad evaluation. That said, it could be concluded that the relocatees are not having the living conditions they wish and this complaint is defined as a condition of deprivation.

Although the opinions of both neighborhoods agreed about the relocation process, the QoL was different between neighborhoods and this difference was statistically significant favoring 27 de Octubre.

6.4. Policy implications

Usually the cost of living increases for relocated people. For example, transportation cost is one issue that affects relocatees (Tamakloe, 1994). Participants in this research live more than ten miles away from downtown. They used to live within two miles of downtown; this implies that their transportation costs have increased. Local authorities should implement a low cost transportation service, which can be adapted to jobs and schools schedules of the affected people. Actions like this would minimize the effect of transport costs and people could continue attending their original jobs and schools, or better still, the authorities should encourage the creation of jobs, near or within the new neighborhoods; this action could reduce the transportation problem. It could implement a combination of both strategies.

Previous studies have illustrated that relocatees' new houses do not share the same characteristics of their former houses (Alcazar & Andrade, 2010; Luis J. Hall et al., 2008; Luis J Hall et al., 2010; Oliver-Smith, 1991; Tamakloe, 1994). Likewise, the size

of the new houses is one of the main issues pointed out by the relocatees in this project. Therefore, this problem must be specially addressed.

The main problem with the new houses is its size. For instance, people used to raise small animals for their livelihood, something that now they cannot be done. The authorities should have provided larger lots that allow them to perform the activities that they used to do. Furthermore, over time, people themselves could build bigger homes. This will give them a sense of permanence and commitment to improving their own community.

Theoretically, in a successful relocation project, the authorities must speak with precision, and involve those affected without hiding information. One of the issues, expressed by the participants, in this relocation project was the lack of information exchange. Therefore the authorities must include the opinions of those affected in the design and implementation of future relocation projects.

The authorities should ensure the reliability of public services such as garbage collection, the supply of tap water, roads maintenance and security. Even the authorities should install police stations in both neighborhoods, so the law enforcement is ensured.

Moreover, the PCA performed in this study agrees with previous research conclusions. People's QoL increases with social integration (Jagodzinski, 2009). Therefore, the authorities should consider the construction of a community center and spaces for building churches, where people can interact and integrate socially in the community.

Overall, relocation projects should theoretically minimize the negative effects over the QoL of those affected. However, no matter how great the efforts of the authorities, these effects are always present as social, economic, or environmental issues, or a combination of them, which at the end will disturb the people's QoL. Therefore, the authorities must learn that relocate people should be the last option in order to improve the QoL of the population (Oliver-Smith, 1991).

6.5. Limitations and future research

One of the potential limitations in this research is about statistics and the confidence level of the sample, which was set at 90%. If it is compared against the 95%, which is typically used, the likelihood that the results of our research are true was reduced. However, a 90% confidence level is within the reliable and acceptable limits. Another limitation is the low number of operational environmental variables compared to the number of economic and social variables.

The confidence level of 90% was selected, in part, because the expectations of finding reluctance of the locals to participate in the survey and fail to fulfill the sample size required. Prior to conducting the survey I visited the area of study to talk with people about the research and I noticed that people saw me with suspicion or disbelief about the objectives I was pursuing. The fact that I identified myself as a professor from a local university helped me to interact with the inhabitants and gain some confidence, like having hired an interviewer who shares the socioeconomic characteristics of potential participants. Moreover, the fact that the research was carried out with my own resources

limited the recruitment of interviewers, so I decided to keep the number of surveys at the lower acceptable limit. However, when setting the actual sample size and in order to obtain a representative sample of the population, I increased the sample size on 12% (from 238 to 266 surveys), which meant a rise of two percentage point in the confidence level against the previously established in the investigation.

The limited number of environmental variables used was due in the first instance because originally few variables that could be measured objectively were identified, one of which was eliminated, from the statistical analysis, because it did not have significant variability (graffiti) and two more were eliminated because their objective measure was in doubt (presence of green areas and air pollution). The first one was eliminated by the fact that the green areas were not clearly defined, rather than green areas they look as derelict land, and regarding air pollution, responses of the participants were more subjective than objective answers. (Berenson, 2001)

To overcome these limitations in future studies; researchers can increase the confident level by becoming familiar with the study area and its inhabitants and if possible get funding for conducting research or look for others methods of survey. With regard to environmental variables, the study areas could be investigated to find out which variables apply in each zone. Regarding the measurement of the air pollution objectively, the technology exists to do so. The major cities in the world monitor the quality of its air constantly. If researchers want to include this variable in future research, they would have to ensure the availability of this data.

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APPENDIX A

Summary of literature

Author	Methods	Variable(s)	Impact (+/−)	Value or Findings
Sirgy, M. and T. Cornwell (2002). How Neighborhood Features Affect Quality of Life *Social Indicators Research*	Factor Analysis	Satisfaction with: job, family, income, health, education, friendship, leisure, social status, and spiritual life.	Measure life satisfaction in three dimension: social, economic, and physical	Both community satisfaction and home satisfaction play a role in life satisfaction. It concludes that satisfaction with the social, economic, and physical features play a positive role in overall feelings toward life
Chen, Z. and G. Davey (2008). Subjective Q of L in Zhuhai City, South China: A Public Survey Using the IWI *Social Indicators Research*	Empirical on Q of L *t*-test, ANOVA, bivariate correlation, Factor Analysis, Cronbach α, regression	PWI + NWI = IWI, + religiosity in Zhuhai City, China.	It emphasizes that the measurement methods used in the west are not necessarily good for Asian countries.	It is one of the few papers that discuss the quality of life in Mainland China with a statistical analysis. On average the population of Mainland China is satisfied with their quality of life.
Glatzer (2006) Q of L in the EU and US: Evidence from Comprehensive Indices. *Applied Research in Quality of Life*	Discussion on Q of L. Comparison of different measures	Objective: HDI, HWI, WISP. Subjective: OSL, PWI, ABS, NWI.	It makes an evaluation of QoL in the EU & US. And define QOL as a constellation of components which can consist of objective living conditions and/or subjectively perceived wellbeing	The smallest northern and western European countries are the ones with the highest QoL in the word. (Economical, Social and Environmental components)
Grimm, M. (2008) A Human Development Index by Income Groups *World Development*	Empirical on Q of L Principal Component Analysis	Education, health, income. Household assets as a proxy for income. 21 low and middle income countries and 11 industrialized countries, from the Household income survey& Demographic and health survey.	The incursion of the income inequality dimension in the HDI. The highest income quintile from a developing country is better off than the lowest from a developed country.	Quality of life of people in the same geographic area is very different between the richest and poorest. The gap between rich and poor is wider in less development countries.
Jagodzinski, W. (2009) Economic, Social, and Cultural Determinants of Life Satisfaction: Are there Differences Between Asia and Europe? *Social Indicators Research*	Empirical on Q of L Regression	Life satisfaction Economic: Income, wealth, and standard of living. Social: Group related expectations Cultural: Literacy and level of religiosity.	It notices the importance of religiosity in Asian countries concerning life satisfaction.	The effect of the variables on quality of life of people may be substantially different across regions. What is good for one region may not be good for another

Author	Methods	Variable(s)	Impact (+/−)	Value or Findings
Tesfazghi, E., J. Martinez, et al. (2009). Variability of Q of L at Small Scales: Addis Ababa, Kirkos Sub-City *Social Indicators Research*	Empirical on Q of L Descriptive statistics, correlation, Factor Analysis	Employment, education, household tenure and size, income, number of children, distance to school and health facilities, population and building density, crime rate and traffic accidents. Sub-city in Ethiopia.	QOL studies are aim to identify intervention areas and monitoring urban planning policies.	When the quality of life is higher, variability is lower
Smyth, R., I. Nielsen, et al. (2010) Personal Well-being in Urban China *Social Indicators Research*	Empirical on Q of L *t*-test, ANOVA, bivariate correlation, Factor Analysis, Cronbach α, regression	PWI, age, education, gender, marital status, their number of children and their average monthly income. In 6 Chinese cities	As HDI and Econ. Growth increase in China the environment is being degraded. 16 out of 20 most polluted cities in the world are in China, (water and air)	The PWI is a useful tool to measure quality of life in the region. The most important indicators for quality of life include age, marital status, number of children and income
Alcazar (2010) Influence of Individual, Urban, and Civil Society Spheres on Quality of Life in Metropolitan Lima, Peru *The Inter-American Development Bank & The World Bank.*	Regression analysis	Income, housing characteristics, safety, health, education, green areas, roads conditions	Demonstrates how the QOL is influenced in different ways: individual, urban and civil society	The three (individual, urban and civil society) levels are important in determining the quality of life.
Cruces et al. (2010) Well-Being at the Subcity Level: The Buenos Aires Neighborhood Quality of Life Survey *The Inter-American Development Bank & The World Bank.*	OLS regression	Number of bus stops, Roads conditions,	An exclusive case for the Buenos Aires Metropolitan Area. Present the Neighborhood Quality of Life Survey	Makes the differentiation between four neighborhoods of Buenos Aires. It shows the importance of both objective and subjective aspects.
Hall (2010) Pricing Amenities in Urban Neighborhoods of Costa Rica *The Inter-American Development Bank & The World Bank.*	Descriptive statistics Regression and principal component analysis	Housing and household characteristics Quality of water and services Crime, health Environment and transport Public participation, social interactions and diversity Entertainment services Cities amenities	Notes that, as throughout Latin America, in Costa Rica more than 50% of the population lives in urban areas. Confirms the use of census information as an important data source	Prove how wages and rents differentials across neighborhoods are used to estimate price amenities

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Author	Methods	Variable(s)	Impact (+/–)	Value or Findings
Lora (2010) Latin American Cities: Their origins, Achievements, and Problems *The Inter-American Development Bank & The World Bank*	Descriptive statistics, regression analysis, probit analysis	Income, water service, electricity, house ownership, household members, children at home, public transportation, roads, education, health, air quality, safety	Provides an overview of the problems of Latin American countries with respect to the QOL in the urban settings	Emphasizes the differences between the Latin American countries in terms of the involved factors on life satisfaction
Medina, Carlos, Morales, Leonardo, & Núñez, Jairo. (2010) Quality of Life in Urban Neighborhoods of Bogotá and Medellín, Colombia *The Inter-American Development Bank & The World Bank*	Empirical on Q of L Correlation	House prices, house characteristics and neighborhood amenities, such as number of rooms, presence of gardens or garage, water service, better building materials, average level of education, distance to places of food supply, number of schools per capita, house pricing, crime, educational inequality, unemployment rates	An exclusive case for Colombia. Highlighting the differences between the cities of Bogota and Medellin	Describes the key QOL indicators for Bogota and Medellin using the hedonic approach life satisfaction approaches
Powell, Andrew, & Sanguinetti, Pablo. (2010) Measuring Quality of LIfe in Latin America's Urban Neigborhoods: A Sumary of Results from the City Case Studies *The Inter-American Development Bank & The World Bank*	Empirical on Q of L Regression	House size, construction characteristics, characteristics of neighborhoods, neighborhood amenities	The differentiation between the hedonic approach and life satisfaction approach	Research on QOL should include qualitative and quantitative indicators

APPENDIX B I

Texas A&M university human subjects protection program
Information sheet

Project Title: Impact of Relocation on Quality of Life

You are invited to take part in a research study being conducted by Roberto Antonio Cantu_Garza, a researcher from Texas A&M University and funded by himself. The information in this form is provided to help you decide whether or not to take part. If you decide to take part in the study, you will be asked to sign this consent form. If you decide you do not want to participate, there will be no penalty to you, and you will not lose any benefits you normally would have.

Why Is This Study Being Done?
The purpose of this study is to know how your quality of life have change because the fact of being relocated to this neighborhood.

Why Am I Being Asked To Be In This Study?
You are being asked to be in this study because you were moved to this site after the 2007 flood.

How Many People Will Be Asked To Be In This Study?
250 people (participants) will be invited to participate in this study locally. Overall, a total of 500 people will be invited at 2 study centers.

What Are the Alternatives to being in this study?
The alternative to being in the study is not to participate.

What Will I Be Asked To Do In This Study?
You will be asked to answer a 102-question survey. Your participation in this study will last up to 30 minutes and includes 1 visit.

Are There Any Risks To Me?
The things that you will be doing are no more risks than you would come across in everyday life.

Will There Be Any Costs To Me?
Aside from your time, there are no costs for taking part in the study.

Will I Be Paid To Be In This Study?
You will not be paid for being in this study.

Will Information From This Study Be Kept Private?

Information about you will be kept confidential to the extent permitted or required by law. People who have access to your information include Principal Investigator and research study personnel. Representatives of regulatory agencies such as the Office of Human Research Protections (OHRP) and entities such as the Texas A&M University Human Subjects Protection Program may access your records to make sure the study is being run correctly and that information is collected properly.

Who may I Contact for More Information?

You may contact the Protocol Director, Roberto Antonio Cantu_Garza, PhD Student, to tell him about a concern or complaint about this research at 993-156-8748 or email address robertocantugarza@yahoo.com.

For questions about your rights as a research participant; or if you have questions, complaints, or concerns about the research, you may call the Texas A&M University Human Subjects Protection Program office at (979) 458-4067 or irb@tamu.edu.

What if I Change My Mind About Participating?

This research is voluntary and you have the choice whether or not to be in this research study. You may decide to not begin or to stop participating at any time. If you choose not to be in this study or stop being in the study, there will be no effect on your life.

APPENDIX B II

Programa de protección personas universidad de Texas A&M
Hoja de información

Título del Proyecto: Impacto de la Reubicación en la Calidad de Vida

Usted fue invitado a participar en este estudio el cual es llevado a cabo por Roberto Antonio Cantu_Garza un investigador de la Universidad de Texas A&M y financiado por él mismo. La información que contiene este documento es para ayudarlo a usted a decidir si toma parte en el estudio o no toma parte en el estudio. Si usted decide participar en el estudio, se le pedirá que firme este documento de consentimiento. Si usted decide que no quiere participar, usted no se ve afectado y no pierde nada.

¿Porqué Se Hace Este Estudio?
El propósito de este estudio es saber si su calidad de vida ha cambiado debido al hecho de haber sido reubicado a esta colonia.

¿Porqué Se Me Pide A Mí Que Participe En Este Estudio?
Se te pide a ti que participes en este estudio porque tú fuiste traído a este lugar después de la inundación del 2007.

¿A Cuántas Personas Se Le Pedirá Que Participen En Este Estudio?
250 personas (participantes) serán invitadas a participar en este estudio localmente. Por todos, un total de 500 personas serán invitadas en dos localidades bajo estudio.

¿Cuáles Son Las Alternativas De Estar En Este Estudio?
La alternativa de estar en el estudio es no participar.

¿Qué Se Me Pedirá Que Haga En Este Estudio?
Se te pedirá que contestes una encuesta de 102 preguntas. Tu participación en el estudio no durará más de 30 minutos y solo se te visitará en 1 ocasión.

¿Existe Algún Riesgo Para Mí?
Lo que tú harás no involucra un riesgo mayor que el riesgo que se tiene en el diario vivir.

¿Existirá Algún Costo Para Mí?
A parte de tu tiempo, no hay costo por participar en el estudio.

¿Recibiré Algún Pago Por Estar En El Estudio?
No recibirás pago alguno por estar en el estudio.

¿La Información De Este Estudio Se Mantendrá En Privado?

Su información se mantendrá confidencial hasta donde lo permita o exija la ley. Las personas que tienen acceso a su información incluyen al Investigador Principal y al personal que trabaja en la investigación. Los representantes de las agencias reguladoras como la Oficina de Protección de Sujetos Humanos de Investigación (OHRP) y entidades como el Programa de Protección de Sujetos Humanos de la Universidad de Texas A & M pueden acceder a sus registros para asegurarse de que el estudio se está llevando a cabo correctamente y que la información se recoge correctamente..

¿A Quién Puedo Contactar Para Más Información?
Puede comunicarse con el Director de Protocolo, Roberto Antonio Cantu_Garza, Estudiante de Doctorado, para comunicarle alguna preocupación o queja sobre esta investigación al 993-156-8748 o correo electrónico robertocantugarza@yahoo.com.

Para preguntas acerca de tus derechos como participante de la investigación; o si tienes preguntas, quejas o inquietudes acerca de la investigación, tu puedes hablar a la oficina del Programa de Protección a Individuos de la Universidad de Texas A&M, al (979) 458-4067 0 irb@tamu.edu.

¿Qué Pasa Si Cambio De Parecer Con Respecto A Participar?
Esta investigación es voluntaria y tienes la opción de estar o no en este estudio. Puedes decidir no estar o dejar de participar en cualquier momento. Si decides no estar en el estudio o dejar de participar en el estudio, eso no tendrá ningún efecto en tu vida.

Survey

Date: _____ **Serial Number:** _____ **Neighborhood:** [_____]

1. Were you voluntarily relocated?   Yes [____]   No [____]

1.1 What do you think about the relocation process? (Personal safety, safety of personal belongings, treatment by the authorities, transport, time, etc.) And why?

_____

_____

_____

_____

1.2 How satisfied are you with your current life versus your life before relocation? And why?

_____

_____

_____

_____

2. How do you rate your quality of life? Before and After Relocation.

Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer

Social Factors
3 How do you rate the following circumstances in relation to your neighborhood? Before and After Relocation.

	3.01 Safety
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	3.02 Public transportation
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	3.03 Distance to work
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	3.04 Distance to health center
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer

	3.05 Distance to school
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	3.06 Road conditions
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	3.07 Existence of police officers
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	3.08 Service at the health center
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	3.09 Quality of the local schools
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	3.10 Participation into social groups
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	3.11 Relationship with your neighbors
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer

Economic Factors
4 How do you rate the following circumstances in relation to your house? Before and After Relocation.

	4.01 Quantity of the sq. mts. of your house
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	4.02 Quantity of the sq. mts. of land in your house
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	4.03 Number of bedrooms
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	4.04 Number of bathrooms
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	4.05 The tap water service
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	4.06 The sewer service
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	4.07 The flooring of the house
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	4.08 The roof of the house
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer

	4.09 Total income at home
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	4.10 Total debt at home
Before	O Very few O Few O Neither few nor many O Many O Too many O No answer
After	O Very few O Few O Neither few nor many O Many O Too many O No answer
	4.11 The job that you have
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer

Environmental Factors
5 How do you rate the following circumstances in relation to your neighborhood?

	5.01 The existence of green areas
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	5.02 Physical conditions of the green areas
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	5.03 The garbage collection service
Before	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
After	O Very good O Good O Neither good nor bad O Bad O Very bad O No answer
	5.04 The air pollution
Before	O Very few O Few O Neither few nor many O Many O Too many O No answer
After	O Very few O Few O Neither few nor many O Many O Too many O No answer
	5.05 Sonic contamination (autos, neighbors, industry)
Before	O Very few O Few O Neither few nor many O Many O Too many O No answer
After	O Very few O Few O Neither few nor many O Many O Too many O No answer
	5.06 the existence of graffiti
Before	O Very few O Few O Neither few nor many O Many O Too many O No answer
After	O Very few O Few O Neither few nor many O Many O Too many O No answer

Social Factors
6. Please answer the following questions.

6.01 Have you had any theft in your property? (home, car, etc)	O No O Yes
6.02 Is there public transportation in your neighborhood?	O Yes O No
6.03 How far is your work from home?	Kms.
6.04 How far is the health center from your home?	Kms.
6.05 How far is the school from your home?	Kms.
6.06 Are the roads of your neighborhood paved?	O Yes O No
6.07 Is there presence of police officers in your neighborhood?	O Yes O No
6.08 Do you have health service?	O Yes O No
6.09 Does any member of the family goes to local schools?	O Yes O No
6.10 Do you belong to any social group in your neighborhood?	O Yes O No
6.11 Do you have friendship with your neighbors?	O Yes O No

Economic Factors
7. Please answer the following questions

7.01 How many square meters does your house have?	Mts²
7.02 How many square meters of land does your house have?	Mts²
7.03 How many bedrooms does your house have?	
7.04 How many bathrooms does your house have?	
7.05 Does your house have tap water?	O Yes O No
7.06 Does your house have sewer service?	O Yes O No
7.07 Does your house have floor slab?	O Yes O No
7.08 Does your house have roof slab	O Yes O No

7.09 What is the total monthly income at home? (Mexican pesos)			
O less than $3,000	O $3,001 to $6,000	O $6,001 to $9,000	O $9,001 to $12,000
O $12,001 to $15,000	O $15,001 to $18,000	O $18,001 to $21,000	O more than $21,000
7.10 ¿What is the total debts at home? (Mexican pesos)			
O less than $3,000	O $3,001 to $6,000	O $6,001 to $9,000	O $9,001 to $12,000
O $12,001 to $15,000	O $15,001 to $18,000	O $18,001 to $21,000	O more than $21,000
7.11 Currently, Does anyone at home have a formal job?		O Yes O No	

Environmental Factors
8. Please answer the following questions in relation to your neighborhood?

8.01 Are there parks or green areas?	O Yes O No
8.02 Does anyone in your family uses the parks or green areas?	O Yes O No
8.03 Is there garbage collection service?	O Yes O No
8.04 Is there air pollution?	O No O Yes
8.05 Is there excessive noise (cars, neighbors, industries)?	O No O Yes
8.06 Is there graffiti in your neighborhood?	O No O Yes

Other Variables
9. Please answer the following questions

9.01 How many people live in your home?	
9.02 Do you own this house	O Yes O No
9.03 Does the house have a garage?	O Yes O No
9.04 Does your house is a multistory one?	O Yes O No

10. General data

10.1 Age _____	10.2 Gender O Male O Female	10.3 Level of Education _____
10.4 Marital Status: O Single O Married O Divorced O Widow O Other		

APPENDIX C II

Encuesta

Fecha: _____ Número de Serie: _____ Colonia: [_____]

1. ¿Fue reubicado voluntariamente?   Si [___]   No [___]

1.3 ¿Qué piensa del proceso de reubicación? (Seguridad personal, seguridad de sus pertenencias, trato de las autoridades, transporte, tiempo, etc.) y ¿Porqué?
_____
_____
_____
_____

1.4 ¿Qué tan satisfecho esta con su vida actual en comparación con su vida antes de ser reubicado? Y ¿Porqué?
_____
_____
_____
_____

2. ¿Cómo califica su calidad de vida? Antes y Después de ser Reubicado.

Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta

Factores Sociales
3. ¿Cómo califica los siguientes aspectos en relación a su colonia? Antes y Después de ser Reubicado.

	3.01 Seguridad
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	3.02 Transporte Público
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	3.03 Distancia a su trabajo
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	3.04 Distancia al centro de salud
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta

	3.05 Distancia a la escuela
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	3.06 Condición de las calles
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	3.07 Presencia de la policía
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	3.08 Servicios en el centro de salud
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	3.09 Calidad de las escuelas locales
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	3.10 Participación en grupos sociales
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	3.11 Relación con sus vecinos
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta

Factores Económicos
4. ¿Cómo califica los siguientes aspectos en relación a su casa? Antes y Después de ser Reubicado.

	4.01 Cantidad de metros cuadrados de su casa
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	4.02 Cantidad de metros cuadrados de terreno en su casa
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	4.03 Número de recámaras
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	4.04 Número de baños
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	4.05 Servicio de agua entubada
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	4.06 Servicio de drenaje
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	4.07 El piso de su casa
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	4.08 El techo de su casa
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta

	4.09 El ingreso total en su hogar
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	4.10 las deudas totales en su hogar
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	4.11 el trabajo que usted tiene
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta

Factores Ambientales
5. ¿Cómo califica los siguientes aspectos en relación a su colonia? Antes y Después de ser Reubicado.

	5.01 La existencia de áreas verdes
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	5.02 Las condiciones físicas de las áreas verdes
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	5.03 El servicio de recolección de basura
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	5.04 La contaminación del aire
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	5.05 La contaminación por ruido (autos, vecinos, fábricas)
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
	5.06 La presencia de grafiti
Antes	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta
Después	O Muy Buena O Buena O Ni buena ni mala O Mala O Muy mala O Sin Respuesta

Aspectos Sociales
6. Por favor conteste las siguientes preguntas.

6.01 ¿Le han robado alguna pertenencia? (en casa, auto, etc.)	O Si O No
6.02 ¿Hay transporte público en su colonia?	O Si O No
6.03 ¿Qué tan lejos está su trabajo de su casa?	Kms.
6.04 ¿Qué tan lejos está el centro de salud de su casa?	Kms.
6.05 ¿Qué tan lejos está la escuela de su casa?	Kms.
6.06 ¿Están pavimentadas las calles de su colonia?	O Si O No
6.07 ¿Hay presencia de policías en su colonia?	O Si O No
6.08 ¿Tiene usted servicio de salud?	O Si O No
6.09 ¿Algún miembro de su familia asiste a las escuelas locales?	O Si O No
6.10 ¿Forma usted parte de algún grupo social en su colonia?	O Si O No
6.11 ¿Tiene amistad con sus vecinos?	O Si O No

Factores Económicos
7. Por favor conteste las siguientes preguntas.

7.01 ¿Cuántos metros cuadrados tiene su casa?	Mts²
7.02 ¿Cuántos metros de terreno tiene su casa?	Mts²
7.03 ¿Cuántas recámaras tiene su casa?	
7.04 ¿Cuántos baños tiene su casa?	
7.05 ¿Tiene agua entubada en su casa?	O Si O No
7.06 ¿Tiene servicio de drenaje en su casa?	O Si O No
7.07 ¿Su casa tiene piso firme?	O Si O No
7.08 ¿Su casa tiene techo de loza?	O Si O No

7.09 ¿Cuál es el ingreso mensual total en su casa (pesos)			
O menos de $3,000	O $3,001 a $6,000	O $6,001 a $9,000	O $9,001 a $12,000
O $12,001 a $15,000	O $15,001 a $18,000	O $18,001 a $21,000	O más de $21,000
7.10 ¿Cuánto es la deuda total de su casa? (pesos)			
O menos de $3,000	O $3,001 a $6,000	O $6,001 a $9,000	O $9,001 a $12,000
O $12,001 a $15,000	O $15,001 a $18,000	O $18,001 a $21,000	O más de $21,000
7.11 Actualmente, ¿Alguien de su casa tiene trabajo formal?		O Si O No	

Factores Ambientales
8. Por favor conteste las siguientes preguntas con respecto a su colonia

8.01 ¿Hay parques o áreas verdes?	O Si O No
8.02 ¿Alguien de su familia usa los parques o áreas verdes?	O Si O No
8.03 ¿Existe servicio de recolección de basura?	O Si O No
8.04 ¿Hay contaminación del aire?	O Si O No
8.05 ¿Hay ruido excesivo? (carros, vecinos, fábricas)	O Si O No
8.06 ¿Hay grafiti en su colonia?	O Si O No

Otras Variables
9. Por favor conteste las siguientes preguntas

9.01 ¿Cuántas personas viven en su casa?	
9.02 ¿Es esta casa de su propiedad	O Si O No
9.03 ¿La casa tiene cochera?	O Si O No
9.04 ¿Es una casa de varios pisos?	O Si O No

10. Datos Generales

10.1 Edad_____	10.2 Género O Masculino O Femenino	10.3 Nivel de Educación _____
10.4 Estado Civil: O Soltero O Casado O Divorciado O Viudo O Otro		

APPENDIX D

Extended conceptual model
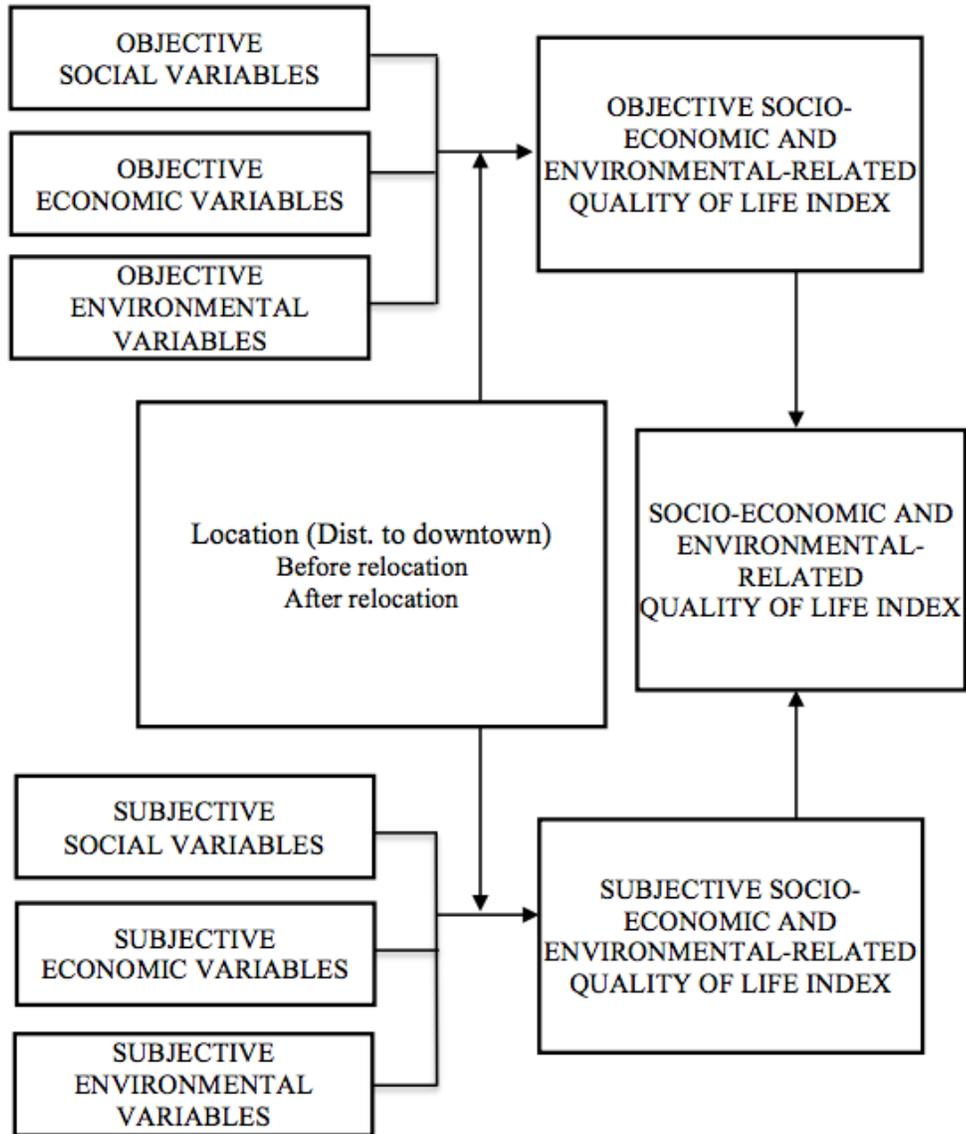
Percentage of respondents from both neighborhoods with specific level of satisfaction
(NA=No answer, VG= Very good, G=Good, NGNB=Neither good nor bad, B=Bad, VB=Very bad,
SD=Standard deviation)

Safety

Level of subjectivity	Safety	
	Percentage (%)	Cumulative (%)
VG	.0	.0
G	.4	.4
NGNB	4.9	5.3
B	84.2	89.5
VB	10.5	100.0
Total	100.0	
Mean	4.05	
Mode	4	
SD	.409	

Transportation

Level of subjectivity	Transportation	
	Percentage (%)	Cumulative (%)
VG	.4	.4
G	6.0	6.4
NGNB	69.5	75.9
B	19.5	95.5
VB	4.5	100.0
Total	100.0	
Mean	3.33	
Mode	3	
SD	.636	

Distance to work

Level of subjectivity	Distance to work	
	Percentage (%)	Cumulative (%)
NA	1.5	1.5
VG	.4	1.9
G	7.1	9.0
NGNB	41.0	50.0
B	40.2	90.2
VB	9.8	100.0
Total	100.0	
Mean	3.47	
Mode	3	
SD	.891	

Distance to school

Level of subjectivity	Distance to school	
	Percentage (%)	Cumulative (%)
NA	.8	.8
VG	2.3	3.0
G	45.9	48.9
NGNB	46.6	95.5
B	4.1	99.6
VB	.4	100.0
Total	100.0	
Mean	2.52	
Mode	3	
SD	.668	

Distance to health center

Level of subjectivity	Distance to health center	
	Percentage (%)	Cumulative (%)
VG	.0	.0
G	3.0	3.0
NGNB	62.8	65.8
B	29.3	95.1
VB	4.9	100.0
Total	100.0	
Mean	3.36	
Mode	3	
SD	.625	

Roads conditions

Level of subjectivity	Roads conditions	
	Percentage (%)	Cumulative (%)
VG	1.1	1.1
G	36.1	37.2
NGNB	22.2	59.4
B	37.2	96.6
VB	3.4	100.0
Total	100.0	
Mean	3.06	
Mode	4	
SD	.956	

Presence of police

Level of subjectivity	Presence of police	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.0	.0
G	.4	.4
NGNB	4.1	4.5
B	88.0	92.5
VB	7.5	100.0
Total	100.0	
Mean	4.03	
Mode	4	
SD	.362	

Services at health center

Level of subjectivity	Services at health center	
	Percentage (%)	Cumulative (%)
NA	.8	.8
VG	.0	.8
G	1.1	1.9
NGNB	68.0	69.9
B	26.3	96.2
VB	3.8	100.0
Total	100.0	
Mean	3.30	
Mode	3	
SD	.633	

Quality of school

Level of subjectivity	Quality of school	
	Percentage (%)	Cumulative (%)
NA	2.3	2.3
VG	.0	2.3
G	34.2	92.1
NGNB	55.6	99.2
B	7.1	100.0
VB	.8	
Total	100.0	
Mean	2.68	
Mode	3	
SD	.738	

Social integration

Level of subjectivity	Social integration	
	Percentage (%)	Cumulative (%)
NA	.4	.4
VG	.8	1.1
G	10.9	12.0
NGNB	58.3	70.3
B	27.8	98.1
VB	1.9	100.0
Total	100.0	
Mean	3.18	
Mode	3	
SD	.704	

Relation with neighbors

Level of subjectivity	Relation with Neighbors	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.8	.8
G	29.3	30.1
NGNB	33.1	63.2
B	32.3	95.5
VB	4.5	100.0
Total	100.0	
Mean	3.11	
Mode	3	
SD	.905	

Square mts. of house

Level of subjectivity	Sq. mts house	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.8	.8
G	2.6	3.4
NGNB	6.8	10.2
B	82.3	92.5
VB	7.5	100.0
Total	100.0	
Mean	3.93	
Mode	4	
SD	.559	

Square mts. of property

Level of subjectivity	Sq. mts property	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.8	.8
G	2.3	3.0
NGNB	6.0	9.0
B	80.5	89.5
VB	10.5	100.0
Total	100.0	
Mean	3.98	
Mode	4	
SD	.569	

Number of bedrooms

Level of subjectivity	No bedrooms	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.0	.0
G	7.9	7.9
NGNB	77.8	85.7
B	12.4	98.1
VB	1.9	100.0
Total	100.0	
Mean	3.08	
Mode	3	
SD	.522	

Number of bathrooms

Level of subjectivity	No bathrooms	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.0	.0
G	35.0	35.0
NGNB	60.5	95.5
B	2.6	98.1
VB	1.9	100.0
Total	100.0	
Mean	2.71	
Mode	3	
SD	.609	

Tap water

Level of subjectivity	Tap water	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.0	.0
G	7.9	7.9
NGNB	59.0	66.9
B	25.9	92.9
VB	7.1	100.0
Total	100.0	
Mean	3.32	
Mode	3	
SD	.722	

Sewer

Level of subjectivity	Sewer	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.0	.0
G	6.0	6.0
NGNB	59.0	65.0
B	32.0	97.0
VB	3.0	100.0
Total	100.0	
Mean	3.32	
Mode	3	
SD	.632	

Floor

Level of subjectivity	Floor	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.4	.4
G	47.7	48.1
NGNB	33.8	82.0
B	16.9	98.9
VB	1.1	100.0
Total	100.0	
Mean	2.71	
Mode	2	
SD	.789	

Roof

Level of subjectivity	Roof	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.8	.8
G	47.7	48.5
NGNB	31.2	79.7
B	19.5	99.2
VB	.8	100.0
Total	100.0	
Mean	2.72	
Mode	2	
SD	.810	

Income

Level of subjectivity	Income	
	Percentage (%)	Cumulative (%)
NA	.4	.4
VG	.0	.4
G	20.3	20.7
NGNB	68.0	88.7
B	10.9	99.6
VB	.4	100.0
Total	100.0	
Mean	2.90	
Mode	3	
SD	.594	

Debt

Level of subjectivity	Debt	
	Percentage (%)	Cumulative (%)
NA	1.1	1.1
VG	.8	1.9
G	10.9	12.8
NGNB	70.3	83.1
B	15.0	98.1
VB	1.9	100.0
Total	100.0	
Mean	3.03	
Mode	3	
SD	.683	

Job

Level of subjectivity	Job	
	Percentage (%)	Cumulative (%)
NA	.4	.4
VG	1.1	1.5
G	55.3	56.8
NGNB	37.2	94.0
B	5.6	99.6
VB	.4	100.0
Total	100.0	
Mean	2.48	
Mode	2	
SD	.657	

Green areas

Level of subjectivity	Green areas	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.4	.4
G	4.9	5.3
NGNB	39.8	45.1
B	52.6	97.7
VB	2.3	100.0
Total	100.0	
Mean	3.52	
Mode	4	
SD	.646	

Conditions of green areas

Level of subjectivity	Condition green areas	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.0	.0
G	4.1	4.1
NGNB	37.6	41.7
B	55.3	97.0
VB	3.0	100.0
Total	100.0	
Mean	3.57	
Mode	4	
SD	.624	

Garbage collection

Level of subjectivity	Garbage collection	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.0	.0
G	10.9	10.9
NGNB	29.7	40.6
B	54.9	95.5
VB	4.5	100.0
Total	100.0	
Mean	3.53	
Mode	4	
SD	.748	

Air pollution

Level of subjectivity	Air pollution	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.4	.4
G	3.0	3.4
NGNB	33.8	37.2
B	59.8	97.0
VB	3.0	100.0
Total	100.0	
Mean	3.62	
Mode	4	
SD	.616	

Noise

Level of subjectivity	Noise	
	Percentage (%)	Cumulative (%)
NA	.0	.0
VG	.0	.0
G	1.1	1.1
NGNB	12.4	13.5
B	81.2	94.7
VB	5.3	100.0
Total	100.0	
Mean	3.91	
Mode	4	
SD	.462	

Graffiti

Level of subjectivity	Graffiti	
	Percentage (%)	Cumulative (%)
NA	.4	.4
VG	3.4	3.8
G	78.6	82.3
NGNB	10.5	92.9
B	6.4	99.2
VB	.8	100.0
Total	100.0	
Mean	2.21	
Mode	2	
SD	.658	