(UN)SAFE AND (IN)SECURE AT HOME: VARIATIONS IN RESIDENTIAL SECURITY
IN BRAZIL

By

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To Tigger

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LIST OF ABBREVIATIONS

CPTED   Crime Prevention Through Environmental Design

IADB   Inter-American Development Bank

IBGE   Brazilian Institute of Geography and Statistics

PNAD   Brazilian National Household Sample Survey

Abstract of Thesis Presented to the Graduate School
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Fear of crime, violence, and security are major issues for Brazil. A common response to fear of crime is through fortifying/securing their place of residence. This manipulation of the built environment is a physical and visual representation of people's need or desire to secure self and family from perceived threats. The well-documented proliferation of walls and high-security gated communities in Brazil, in addition to the rest of Latin America, is evidence of a prevailing fear of crime. These well-fortified homes and communities are both inspired by and inspire a fear of crime. This study describes the state of household security and fear of crime in urban areas in Brazil to create a baseline of data for use in future comparative research, while also establishing a relationship between fear of crime and residential fortification. Data from the 2009 Brazilian National Household Sample Survey (PNAD) is used and analyzed employing a variety of statistical techniques including ordinary least squares regression modeling. This research concludes that by controlling for sociodemographic variables, victimization, and housing-related variables, fear of crime in the city has a positive and significant effect on degree of usage of residential security devices by heads of households in urban areas of Brazil.

CHAPTER 1
INTRODUCTION

Through my personal experiences and observations across many different cities in Brazil, I have seen how residents have implemented various security mechanisms to fortify their homes against threats. As a frequent student and tourist without an automobile in Brazil, walking was my main form of transportation. I sometimes found walking around the city and its surrounding neighborhoods to be intimidating and scary due to the omnipresence of high walls, tall security fences, bars and security grills protruding from windows, and sometimes even walls lined with shards of glass to ward off intruders or would-be criminals. Not only was I in a foreign country where they spoke a foreign language, but the urban form was foreign too. I was not used to what I was seeing. Inasmuch as I was translating what people were saying to me in Portuguese, I also was "translating" what I was "reading" in the built environment of the city surrounding me. The Brazilian urban built environment, for me, translated into "fear", "crime", "insecurity", and "violence", which in turn informed my behavior and responses. Without a doubt, my impressions of the built environment around me altered the way I experienced these cities and Brazil in general.

These elements, highly visible in the built environment and experienced on a daily basis in Brazil, influence the thoughts and perceptions of the passerby, leading one to think there might be a crime problem or something to fear in these environs. They create a sense of anomie and isolation in addition to this fear, ultimately restricting one's ability to move about freely in the city and its public spaces. My experiences lead me to several questions: Is crime really such an issue that these security measures need to be put in place? Do these residents feel safe? Are they living in fear? Was it

fear that made them secure their home? What else are Brazilians doing to protect their homes? Do certain groups of people feel more threatened, or have different responses to crime?

Throughout this study, variations on the words "safe" and "secure" are used frequently. It is important at this point to distinguish the terms "safe" and "secure," and why they are both essential to this study. In this case, the word *segurança* is central to the survey data on which this research is based. Curiously enough, the Brazilian Portuguese word *segurança* translates as either safety or security. Like many Portuguese words, there are no direct, one-word translations into English which fully encompass the true meaning of the word. According to Merriam-Webster's Dictionary, "safe" is defined as "free from harm or risk" and "secure from threat of danger, harm, or loss" ("Safe," n.d.). "Secure" is defined as "protected from danger or harm" and "providing protection from danger or harm" ("Secure," n.d.). In my opinion, using the full English translation in the title of this study expresses a more nuanced understanding of the Brazilian Portuguese word *segurança*. In English, a phrase that is used often is "safe and secure." This phrase conveys two distinct yet related conditions in their meanings, which is something that might be missing, or lost in translation, if I were to only use the word *segurança*. It is essential to use both "safe" and "secure" because they may also have certain value and meaning attached to them by a native English speaker, and may offer a better understanding of the term segurança to a reader whose first language might be Portuguese.

The feelings of insecurity and lack of safety, along with the fear of crime (or perception of it) I experienced is not unique to tourists or foreigners, but is something

Brazilians experience as part of their daily lives as well. This fear of crime stems from a multitude of factors and also spurs certain behavioral responses. As a tourist (not having a permanent home), I opted for avoidance strategies – not going out alone, not walking on the street at night, avoiding certain streets or neighborhoods, etc. But, for a resident who has a home, a common, instinctive behavioral response or coping mechanism to this fear is to also use protective measures, that is, to fortify and secure their place of residence. This manipulation of the built environment is a physical and visual representation of people's need or desire to protect and secure self and family from perceived threats. The well-documented proliferation of walls and high-security gated communities in Brazil, in addition to the rest of Latin America, is evidence of the prevailing fear of crime felt by residents in urban areas. These well-fortified homes and communities are both inspired by and inspire a fear of crime.

A general idea of Brazilians' attitudes and perceptions of crime can be gained by taking a look at the 2010 AmericasBarometer Survey[1] (LAPOP) results. Based on this public opinion poll from 2010, around one-third of Brazilians believe that issues related to violence and personal security are major problems for their country, with violence being the most common response to this survey item. This is high compared to the United States, which, using the same survey from 2010, shows that only one-tenth of Americans feel this way about their country. These polls further reveal that around 90% of Brazilians believe that current levels of crime pose a threat to the country's future,

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[1] The AmericasBarometer is a well-known survey conducted throughout the Americas by the Latin American Public Opinion Project hosted by Vanderbilt University. I chose to use this data because it is available through and used frequently by students and faculty in the Center for Latin American Studies at the University of Florida.

compared to 74% of Americans. When asked about issues or problems that worried them frequently, Brazilians' second most frequent answer was security, crime, and gangs (15%). Additionally, about one-third of the Brazilian population fears being a victim of a crime in their neighborhood; while only 8% of Americans experience this same fear.

Clearly, violence and crime are of relatively great concern in Brazil, with many people worrying and experiencing fear related to it. The general climate of insecurity is evident in peoples' increasing isolation and disconnection from community and public space. This disconnection and isolation, facilitated by the design of space and place, has led to certain attitudes. Data suggest that attitudes toward crime are increasingly hardening in Latin America, with more support for hard-lined crime fighting (Prillaman, 2003). The traditional methods of preventing crime, for example, by increasing the presence of the police, is not effective in Brazil due to widespread corruption[2] and requires more innovative and comprehensive measures. Nonetheless, in order to make recommendations for said measures, it is important to take a look at what is being done now, and by whom.

Fear of crime is as much an issue as crime itself, as both have deleterious effects both for people and the state. The costs of crime, according to Prillaman (2003), "pose a problem for development, including slowing economic growth, undermining democratic consolidation, and eroding vital social capital" (p.3). However, fear of crime, irrespective of actual incidence of crime, has also shown to negatively affect quality of

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[2] Transparency International ranked Brazil as the 69th most corrupt country in 2010, with a rating of 3.7 on a scale of 0 to 10 (with 0 being highly corrupt and 10 being very clean). For perspective, the United States was ranked 22 with a score of 7.1.

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life due to its emotional, environmental, social, and economic impacts. Fear may cause stress and anxiety, a lack of trust in others, increased isolation and diminishing social connections. Not only can people suffer emotionally and mentally, but their behavioral responses can lead to changes in daily routines and activities, as well as in the environment (design of the built environment and defensive residential architecture). Economic effects of both crime and fear of crime are vast, including increasing expenditures by the public and private sector on private security and security infrastructure. Moreover, individuals are willing to pay more for housing in order to feel safe, according to a recent IADB study (Vetter et al, 2013) This is money and capital foregone that could have been spent or invested elsewhere, like on education and health.

Fear of crime, oftentimes unrelated to actual crime rates, may result in an over-fortified built environment which is only reproducing these fears and feeding a fear cycle. The majority of the available studies and literature focuses on how fortified residences and gated communities inspire or reproduce fear, but this study suggests that fear is an important predictor of the need to fortify and secure the home in the first place. Although this has been suggested implicitly, this relationship has not been tested explicitly. This study comes at a time when crime and human security in Brazil are more important than ever with the approaching World Cup and 2016 Olympic Games. These impending international mega-events are major draws for international tourists and increasing global media attention. If the locals don't feel safe in their own city and barricade themselves in their private fortresses, how are the multitudes of international visitors supposed to trust they will be safe? The world will be watching and listening for

their perceptions and impressions of Brazil and its cities. Clearly, addressing the issue of fear of crime and attempting to reduce it may improve the quality of life for Brazilians. It may also have positive social and economic effects, in addition to long-term effects on the character of the built environment in Brazilian cities. Improving human security could lead to positive growth and development of the country in a time when Brazil is under the spotlight on the world stage.

With these observations in mind, this study aims to achieve two goals. One goal is to paint a picture of the state of household security and fear of crime in urban areas in Brazil. Little research has been done on this topic, and it is useful to create a baseline of data for use in future comparative research. The final goal of the study aims to establish a relationship between fear of crime and residential fortification. The hypotheses to be tested are as follows:

1. A strong association exists between fear of crime and degree of home security/fortification when the net effect of victimization and various socio-economic factors are controlled;

2. Brazilians use tall walls/fences more than any other security measure for their residences;

3. Brazilians feel safest in their home, and less safe the further away they get from their home;

4. Differences exist in household choice of home security measures by location, demographics, victimization, and household characteristics.

The following section gives context to the study area, introducing the reader to Brazil with a brief description of general characteristics followed by some background and history. This chapter closes with a section outlining the organization of the remaining chapters in this thesis.

Study Area

Brazil is the largest country in South America, as well as the fifth largest country in the entire world (by territory and population). It is in a unique position to be bordered by all South American countries except for Chile and Ecuador, while also containing the largest water resources in the world as well as some of the most biodiverse lands. Brazil covers 8,514,880 square kilometers, and is divided into 5 major regions: North, Northeast, Center-West, Southeast, and South. The country has a population of 203,429,773 (a 2011 estimate), with an annual population growth rate near 1.1%. The average life expectancy is 73.5 years. While 26% of the population is under 14 years of age, only 6.7% is over 65. On average, Brazilians attend 7.2 years of school. The gender ratio is on average 1 to 1 (Central Intelligence Agency, 2012).

Brazil has many large cities, with its largest cities being São Paulo and Rio de Janeiro in the highly populated Southeast region. The percentage of the population living in urban areas is at 87%. An overwhelming majority of urban populations have access to improved drinking water sources, at 99%, while only 87% have proper sanitation facilities access. The majority of the population is white, at 53.7% percent, with the next largest category being shades of brown to black (Central Intelligence Agency, 2012).

Brazil is a melting pot, with European, African, and Native Indian heritages mixed together as a result of hundreds of years of miscegenation starting in colonial and slavery times. This, along with the history and geography of the conquest, colonization, and internal migrations of Brazil, has resulted in a rich and varied culture across different regions of Brazil.

Brazil was established as a Portuguese colony for more than three hundred years. It remained under colonial rule until its independence in 1822, from whence it was ruled as a monarchy until two major events happened in the history of Brazil. The slave trade was officially and completely abolished in 1888, followed by the military establishing a republic in 1889. The demise of the monarchy and the rise of the Old Republic (in theory a constitutional democracy, yet effectively only the wealthy and literate few could vote) were paired with the rise of the coffee trade and the rule of the wealthy land-owning few. Later in the twentieth century, Getúlio Vargas led a populist revolt in 1930. This marked the beginning of industrialization and of several decades of populist and military rule/dictatorships. In 1985, Brazilian military rule ended when power transferred into the hands of civilian leaders. This transition to democracy was culminated by the establishment of the New Constitution of1988 which declared Brazil a Federative Republic.

Brazil, like many Latin American countries, experienced a period of rapid growth and urbanization as a result of increasing industrialization since about the middle of the 20th century. Many people migrated to commercial centers, like Rio de Janeiro and São Paulo, to find work. This exacerbated regional inequalities, while also resulting in rapid growth of urban populations that often outpaced the city's ability to handle them. This led to many problems related to health, housing, transportation, environmental degradation, education, inequality, and last but not least, crime and violence. These are some of the many problems the Brazilian government has struggled to keep up with as the urban population grows. Crime rates have risen concurrently with increasing urbanization. These problems all pose threats to development, and crime is important

because human security is a key aspect of development, and greatly affects quality of life.

Outline of Chapters

This thesis contains five chapters. Following the Introduction, Chapter 2 is a literature review of pertinent studies and findings on fear of crime and responses to fear of crime, and the relationship between the built environment and fear of crime. Chapter 3 explains the methodology used to test the hypotheses, based on a variety of statistical measures and tests. Chapter 4 presents the results of the data analysis, finally to be followed by Chapter 5, the Discussion and Conclusion. This final chapter discusses the results in further detail, explaining the implications they have for Brazilian citizens and policymakers, as well as impacts in the fields of crime prevention and criminological theory, not to mention urban planning. Based on these analyses and results, recommendations are made for future research and policymaking.

CHAPTER 2
LITERATURE REVIEW

Much of the extant literature on the relationship between fear of crime and the built environment in Latin America focuses on the building of walls, residential fortification, and the rise of gated communities. It is often stated that fear of crime is the cause of this trend as far as the Latin American case is concerned (Caldeira, 1996; Caldeira, 2000; Coy & Pohler, 2002; Borsdorf et al., 2007; Giglia, 2008; Silva, 2007; Vilalta, 2011a; Vilalta, 2012). There have been several qualitative studies carried out across the globe, in North America, Europe, South Africa, and Australia. These studies link fear with self-protective home security measures, where residents of gated communities were interviewed or surveyed to find out their motivation for moving into this type of community, and often these people cited "fear" or the desire for "security" as the main motivation (Blakely & Snyder, 1997; Wilkinson, 1998; Atkinson & Flint, 2004; Lemanski, 2006; Blandy, 2007; Low, 2008). But, what about those whose action is socially and economically constrained? Much study focuses on those who can and do move to gated communities, but this requires resources. Some don't have the luxury to do so, be it because of income constraints, the potential loss of a social network, location of work from home, etc. There are many factors that can weigh in on this decision. Those that do not have the means or will to move, who also experience this same fear of crime because of increasing urban crime and disorder, would logically respond to this fear with easier, more accessible routes toward self-protection. Home protection measures may be the more affordable and convenient response to fear of crime in urban areas. It is important to look more comprehensively at the measures people are taking in response to fear of crime as it pertains to crime prevention

measures at the household level. This is the gap in the literature that I suppose to address here in this study.

Furthermore, is the relationship between fear of crime and home securitization being taken for granted? Is it just that the fear of crime is the logical and intuitive connection between high rates of crime and choosing to live in a secure residence? It is reasonable to expect that this relationship varies across cultures and place. The recent growing concern about the built environment and how it is shaping public and private lives, as well as reinforcing fear in our cities, furthers the need for this study. I aim to take a step back, to re-analyze the original claim that fear of crime is what motivates people to secure and protect their home and loved ones, while also exploring the different types of protections used by different households. I use Brazil as my case study to add to the body of international literature on this topic.

The literature review will cover the main issues, fear of crime and residential security and fortification, defining both and exploring the research done so far.

Fear of Crime

It has been well established that fear of crime is difficult to define and operationalize, given that it is such a broad encompassing term that is influenced by many things. There is a debate on how to best measure it, and this is one of the main limitations to being able to draw general conclusions from the studies available. Different operationalizations and measurements can lead to varying results. What has been agreed on is that there is no definitive answer, and the nature of survey questions and different factors influence fear of crime in different ways across time, space, and cultures (Gerber et al., 2010; Koskela & Pain, 2010; Ferraro, 1995). Nevertheless, researchers have consistently pointed to individual demographic characteristics,

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(perceptions of) neighborhood social and environmental conditions, and victimization as main influencers of fear of crime (Bannister & Fyfe, 2001; Scarborough et al., 2010).

The definition of fear of crime is often taken for granted, allowing for ambiguities of understanding. Fear of crime can be defined as "an emotional response or dread or anxiety to crime or symbols that a person associates with crime. This definition of fear implies that some recognition of potential danger, what we may call perceived risk, is necessary to evoke fear" (Ferraro, 1995, p.8). According to Ferraro (1995), different types of survey questions measure fear of crime based on different perceptions. People may perceive crime on a general or personal level in how it affects them, and across a cognitive-affective perception continuum, with judgment, value, and emotional perceptions of safety, risk, and crime. For example, a survey question asking how safe a respondent feels is related to their personal/cognitive judgment of risk. These perceptions highlight the many different ways in which fear of crime may be measured.

Fear of crime is an urban issue according to Skogan and Maxfield (1981). They use a basic measure of fear of crime in their study on responses to crime, surveying respondents on their feelings of safety. The survey question does not even use the word "crime". Their tests indicate, despite the fact that fear of crime is often considered to be multi-dimensional and reflecting other anxieties about urban life and the future (Hale, 1996 in Bannister & Fyfe, 2001), that "feelings of safety" is an independent issue reflecting fear of crime and not fear of other issues. Indeed, "feelings of safety" is a valid operationalization of "fear of crime".

Lab (2000) makes clear that fear of crime is a real emotion experienced by humans and warrants attention, no matter what spawns this fear or where it comes

from. He states that whatever the influences on this fear are, they are what influence the responses to it. This real emotion, even if it does not reflect reality, "forms the basis for daily "inactivity" and anxiety" (Lab, 2000, p.7). But, this draws attention to the fact that fear of crime is often treated as something negative, to be dealt with and reduced. It is generally accepted as something that negatively affects quality of life (Bannister & Fyfe, 2001; Foster & Giles-Corti, 2008), but Jackson and Gray (2010) bring to light an important point that fear of crime can be a healthy emotional response to crime which engenders a "functional worry" that promotes positive coping behaviors, engendering agency in one's self-protective and precautionary behaviors.

As violence has increased in Latin America, so has this "fear of crime", and this has shaped social relations and the direction of the built environment in Brazil (Caldeira, 2000). A need to self-protect, and for some, retreat to gated communities and high-rise condominiums, has been often discussed in the literature as a prevailing response to crime and the fear of crime, especially in Latin America. Nonetheless, the current trend of walls and boundaries and private security guards to keep out both imagined and real crime and violence, as evidenced by the trend of highly secure gated communities and condos, simultaneously is inspired by and inspires a fear of crime (Davis, 1990; Caldeira, 2000; Atkinson & Flint, 2004).

It would be neglectful at this point to not mention the fear of crime feedback loop as it is one of the reasons fear of crime research can be so complicated. Fear of crime is not an emotional or cognitive response existing in a vacuum. Fear of crime is both an exogenous and endogenous self-defeating factor in the processes related to the shaping of the built environment (Lee, 2001; Wilkinson, 1998). The origin of fear of

crime cannot be pinpointed exactly, or as Lee states, it "has no specifically locatable 'birth' moment" (Lee, 2001, p.481). This can also be known as the causality dilemma, also known in layman's terms as the chicken and the egg dilemma. It is a question of which came first, and is especially pertinent to the relationship between residential fortification and fear of crime. Were people fearful first, leading to residential fortification? Or did pre-existing residential fortification cause people to be more fearful and perceive a lack of safety? Consequently, it can be understandable that causal relationships cannot be established. However, the impacts of fear of crime and its interaction with other factors alone make it worthy of study.[1]

The following section will explore actual victimization and vulnerabilities in contemporary Brazil, as these are factors feeding the "feedback loop" of fear of crime.

Crime Victimization and Vulnerabilities in Brazil

Brazil has gained increasing global attention in recent years as an emerging power. However, crime and violence persist as problems plaguing the nation as well as individuals as they carry out their daily lives. The incidence of violence is real, and part of urban everyday life in Brazil, resulting in a "culture of fear" (Caldeira & Holston, 1999, p.695). The AmericasBarometer (LAPOP, 2010) has information on victimization that is useful when exploring this topic.

As far as victimization is concerned, nearly a third of Brazilians reported that either they or someone in their home had been victim of a crime in the previous year,

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[1] Because of the causality dilemma inherent in the relationships between the concepts used in this research, it is important to reemphasize that there is no causal ordering being established by the models used in this study. Associations and correlations can be established between these concepts, but the shape and direction of causality cannot. It is both possible that fear of crime may result in residential fortification or that residential fortification may influence or lead to fear of crime.

compared to about one-fifth of Americans reporting the same (LAPOP, 2010). As far as

the location of crimes is concerned, results were similar between Brazil and the US, with

a little over one-third of crimes in Brazil from the previous year occurring in the home;

while a little under one-third occurred in the home in the United States. Together, this

data from 2010 identifies that crime and violence are prevailing problems in Brazil. But,

different groups of people experience varying degrees of risk as it pertains to

victimization, and a recent study done by Wood and Ribeiro (2013) sheds some light on

this and their findings are discussed in the following paragraphs.

Due to the nature of fear of crime and the multitude of factors influencing it, it is

helpful to look at current rates of various types of victimization. Historically, poor, young

black men have been more likely to be a victim of crime than any other demographic

group in Brazil. And crime victimization is, in effect, segregated in the same way as

residential segregation in Brazil, between rich and poor, black and white (Rial & Grossi,

2002).

Wood and Ribeiro's (2013) findings are informative for identifying the most

vulnerable members of Brazilian society currently. In their study they analyze both Pan

American Health Organization data and Brazilian PNAD data on homicide, crime, and

victimization. Reported homicide rates since 1995 have generally risen in Brazil, despite

the existence of some troughs and crests. To give some perspective, since 1995, rates

of homicide have declined in the US steadily while Mexico's declining homicide rates

began to spike back upwards starting in 2007. Regardless of these trends, the homicide

rate in Brazil remains significantly higher than in these other countries, at above 25 per

100,000 people. From 1988 to 2009, assault rates have increased 0.4% nationally.

Aside from violent crime, which has impacts on fear of crime, property crime is also a focus of Wood and Ribeiro's (2013) research. There has been a greater increase in urban property crimes than in rural property crimes. Property crimes suffered by victims, to include robbery and theft, have risen both nationally and within each region of Brazil, from 6.3% to 7.9% of the general population. The greatest rate increases are in the Northeast, North, and Center-West. Much lower rates and slower growth are found in the South and Southeast regions.

Their study also shows a reversing trend in vulnerabilities (Wood & Ribeiro, 2013), whereas in 1988 youth aged 16-24 were least likely to be victims of property crimes, in 2009 they are more likely to be victims. Currently, the least likely victims are over the age of 45. The trend also show that the more education one achieves, the less their likelihood of being the victim of a property crime. However, it is important to note that this remains the category (over 13 years of schooling) with the highest rate of victimization over time. This is paralleled by the 2009 findings on income, which are expected since income and education are often highly correlated with each other. Within the realms of gender and race, men are consistently more victimized than women, and the racial category of "Brown" is more vulnerable than "White" or "Black", a departure from 1988 data on victimization which presents "White" as the more likely victim. Nonetheless, the rates of victimization across race and age appear to be evening out.

All in all, the current portrait of crime vulnerability in Brazil is that of a wealthy, highly educated male, living in an urban area in the North region. Conversely, the least vulnerable Brazilian would be a white female over the age of 45, with less income and education living in a rural area of the Southeast (Wood & Ribeiro, 2013). These

vulnerabilities are important to identify as they may influence who is more likely to experience varying levels of fear of crime. These current victimization rates in Brazil are also instructive, as they support the claim that crime in urban areas is increasing in Brazil, and also have influence on the spread of fear.

A Paradox: Actual Crime and Fear of Crime

The focus of this study is on fear of crime, and the issue of the relationship between actual crime and fear of crime is complex and beyond the scope of this study. Nonetheless, it warrants brief attention to give the reader some context of the debate within which fear of crime is couched. In Skogan and Maxfield's seminal work Coping with Crime (1981), they acknowledge the existing relationship between crime and fear of crime, in that fear is an indirect consequence of actual crime. Actual crime is experienced by some, but the indirect experience of crime, or the vicarious experience of crime (knowing a friend or family member, or even a community member who was a victim), is experienced by or exposed to many. Beyond this, exposure to various sources of media (which often sensationalize crime and violence for ratings purposes) and perceptions of physical disorder in the environment are also indirect experiences of crime (Skogan & Maxfield, 1981). For this reason, fear of crime is experienced by more than just those who are in fact victimized, and this is why those who have not been victimized also take precautionary steps to prevent crime. In fact, in Brazil, most criminal activity and violence occur away from middle and upper class neighborhoods, yet security services and equipment are concentrated in these areas marked by less crime (Rial & Grossi, 2002).

Interestingly enough, they also show that many people who are more vulnerable still do not take the precautions that they should (Skogan & Maxfield, 1981). Their

findings show that the relationship between crime and fear is not a simple one, and an area warranting further research and attention.

Responses to Fear of Crime

Fear of crime affects urban daily life. The varied responses have been extensively covered in the literature and across disciplines (Blandy, 2007; Caldeira, 2000; Giblin, 2008; Lab, 1990; Lab, 2000; Lemanski, 2006). The fields of criminology, urban planning, sociology and anthropology have all delved into the topic of fear of crime in cities, how people have responded, and what feeds it. Fear of crime leads to changes and adaptations within the physical and social realms, like adding or increasing home security, moving into gated communities, avoidance behavior and changes in daily routine.

Caldeira (2000) discusses crime and fear of crime in the Brazilian context, and their impacts on the built environment, how they together lead to changes in individuals' daily/routine behavior and activities. She criticizes the recent trend of walled fortresses in Brazil, or "fortified enclaves," and the negative impacts they have on societal behavior and daily life.

> People feel restricted in their movements, afraid, and controlled; they go out less at night, walk less on the street, and avoid the "forbidden zones" that loom larger and larger in every resident's mental map of the city... Encounters in public space become increasingly tense, even violent, because they are framed by people's fears and stereotypes. Tension, separation, discrimination, and suspicion are the new hallmarks of public life. (Caldeira, 2000, p.297)

Beyond this, the UNDP Global Report on Human Settlements (UN-Habitat, 2007) supports this view, and reported on countries' feelings of insecurity as it related to walking the streets at night. A survey of 35 countries showed Brazil as the country with the highest percentage (around 70%) of respondents that felt unsafe walking home at

night. The United States ranked second-to-last, with only around 15% of people feeling unsafe.

Clearly, urban fear and the responses people have to it affect the way they experience daily life. The focus of this research, however, is on those responses that affect the physical realm of the home, those which aid in protecting self and property.

Gated Communities

Gated communities in Latin America represent the extreme case of residential fortification. A gated community is defined as a walled or bounded residential area, either explicitly designed or retro-fitted, with access control measures, a privatization of normally public spaces, and an underlying self-governance structure (like an HOA or COA) (Blakely & Snyder, 1997). These walled, secure residential areas of today mimic the walled fortresses of antiquity. Nowadays, a "fortress mentality" prevails (Davis, 1990; Wilkinson, 1998), characterized by a ubiquitous obsession with and consumption of physical security, resulting in the "fortress effect" (Davis, 1990).

Gated communities are not the exclusive focus of this study, but they do indeed fall into the general category of home security measures taken by Brazilian households. The trend towards gated communities, or *condomínios fechados* in Brazil, is not particular to Latin America. The rise of gated communities started in the US and Great Britain, spreading across the globe and becoming popular in countries with urban crime problems. They became an easy way for developers to prey on those urban fears for their own profit, while providing a product to consumers who sought security and safety, status, and certain lifestyles and amenities (Blakely & Snyder, 1997). The proliferation of gated communities in Latin America has been well documented, and what the literature consistently has in common is their citing of fear as the main motivator and

reason for people moving to gated communities (Caldeira, 2000; Coy & Pohler, 2002; Giglia, 2008; Vilalta, 2011a). In Brazil, this began in the 1970s and since the 1980s has spread quickly and replicated themselves across cities, big and small (Silva, 2007).

Of importance to this literature review is Caldeira's work focusing on the changing patterns in the built environment in São Paulo, Brazil. The city was segregated along the center-periphery model as a result of the legacy of colonial times and geography of contemporary industrialization. After the economic restructuring of the 1980s and an increase in crime and violence, however, this pattern starts diffusing. Overlaid on the center-periphery model is the development of highly-walled urban clusters of the upper and middle classes dispersed throughout the lower-income areas. There are still, however, those elite that refuse to abandon the traditionally elite center. The dispersed urban clusters tend to be in closed-condominium developments which ideally become "separate worlds" (Caldeira, 2000, p.264), and those that remain in the city opt for high-security luxury high rises (Caldeira, 1996). The fear of crime is a strong motivator for segregation, and the upper and middle classes attempt to maintain their separateness with boundaries from their social unequals, manifested in their choice of secure housing. "Fear of crime is helping to create distance and separation among social groups and, thus, to enforce segregation" (Caldeira, 1996, p.63).

Caldeira studies segregation as an implication of this trend towards residential fortification, and does so in terms of income. Implied, however, is the racialized nature of this segregation. If fear of crime is a motivator for fortification of residence, then it could be assumed that this occurs along monetary and racial lines. Caldeira explains that this new form of segregation displayed in fortified residences decreases the quality

of life for the nonwhite poor of Brazil, and encourages fear and isolation for everyone. As security and seclusion become synonymous with "happiness, harmony, and even freedom" (Caldeira, 2000, p.266), the poor nonwhite majority are implied to live without these things, or are not deserving. Other consequences of this new spatial order and segregation in the built environment are suggested to include incivility, crime, and a lack of a sense of responsibility. This loss of connection, or lack of physical interaction with others, is leading to an "undemocratic and non-modern space" (Caldeira, 2000, p.4).

This loss of connection can be seen in the abandonment of public spaces by both the elite and the poor. The process of gating communities turns street private, controls new and old spaces, and reduces freedom of access. "Streets are leftover spaces, and the material quality of public spaces is simply bad" (Caldeira, 2000, p.310). Caldeira provides insights into the importance of studying the built environment, because it "may be the arena in which democratization, social equalization, and expansion of citizenship rights are contested" (Caldeira, 2000, p.4). A democratic society and a modern, developed city should be characterized by openness, freedom, and accessibility in both the social and physical form of urbanity.

The organization of urban space is a result of social differentiation and separation according to Caldeira. Methods of social differentiation historically have changed from type of housing, to distance, and now to security and high walls. The importance of security as a measure of social differentiation also promotes new forms of social discrimination. Caldeira would argue that, although physical distances are decreasing and therefore giving the impression of a more heterogeneous urban form, social inequalities and differences are actually being reinforced by both physical and

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imaginary walls (Caldeira, 1996). Increasing social inequalities and a prevailing fear of the 'other' continue to reinforce people's need and desire towards fortification.

In "Urban Fear in Brazil: From favelas to The Truman Show," Rial and Grossi (2002) study the "culture of fear" in Brazilian cities and collect information from newspapers, interviews, and observations in four major Brazilian cities. They analyze how the urban fear experienced by people of different social classes and ethnicities has transformed itself into a determining factor for the spatial and ethnic organization of the city, as well as the use of public space.

With increasing urbanization and growing urban densities, the spatial proximity between rich and poor, white and black, living right next to each other in the urban landscape, instills fear in the white population, leading them to build walls, install gates and cameras, and hire private security forces. They have abandoned public spaces, and even privatized streets for fear of exposure to crime. This urban fear has even led some elites to flee, or move away, to cities such as Florianópolis where crime rates are lower, yet they still live in their secure, gated condominiums. These abandoned public spaces have become stigmatized and dangerous for not only the elite, but for the nonwhites as well, because in some cases, not even the police will enter these public spaces, spaces that have become ignored, like the poor, oppressed blacks that live there (Rial & Grossi, 2002).

De Souza e Silva (2010) also comments on this increasing spatial proximity between urban residents and emphasizes how the architectural form of gated communities impacts the urban form and the immediate neighborhood character and its residents. In her study on gated communities in Natal, Brazil, she finds that the tall walls

that are built for those seeking security and safety only encourage fear of crime in those who live outside and in close proximity to those walls. While these walls are socially divisive, they are not unique to the wealthy; gated communities have become a staple of some middle- and low-income communities. Their communities may not be a sophisticated as others, but they seek to control access and protect and secure from urban fears. De Souza e Silva supports the notion that these communities are created from this "culture of fear' while also furthering it (Silva, 2010).

Coy and Pohler (2002) emphasize the impact of an "exaggerated, psychosis-like fear of crime" on fortification and the move towards gated communities/condominiums in Brazil and Latin America. They note that gated communities in Brazil and Latin America tend to be much more fortified than their equivalents in the United States, with more advanced security technology. They expand beyond fear of crime as a reason for fortification, however, and cite other social and economic reasons for this popular desire to fortify. Some other social reasons include social differentiation and self-segregation along with a desire to leave the chaos and disorder of cities. Economic reasons are rooted in both the supply side and the demand side, where developers seek to profit on consumers' fears, in conjunction with their ability to find cheap land on which to build these communities. Consumers desire a place where efficiency is maximized and all of the amenities of daily life are located in one place. In the end, however, these high-tech fortified communities produce a false sense of security (Coy & Pohler, 2002).

In his 2006 article "When a Favela Dared to Become a Gated Condominium: The Politics of Race an Urban Space in Rio de Janeiro," Vargas shows how patterns of urban occupation are linked to race, and conceptualizations of race are linked to urban

space, thereby forming a cyclical and self-reinforcing structure. He uses ethnographic data to analyze a 2001 event when activists in the favela of Jacarezinho installed gates and security cameras, and the non-favelans and police were outraged because they felt threatened. These types of security measures were reserved for the middle and upper classes for their gated condominiums to keep the poor and the blacks out. How dare a favela try to equal itself with an elite residential area? How dare they monitor the actions of the police in their favela? The media coverage of this event racialized the event, criminalized poor blacks, and encouraged typical racist stereotypes, and reinforced existing urban fears. "Jacarezinho's gates and cameras constituted a frontal challenge to the normalized representations, privileges, and power structures that define Brazil's profoundly racialized social inequalities" (Vargas, 2006, p.51) because they represent political will, action, autonomy, something the white elite reserve for themselves.

Forty percent of Rio's population lives in favelas, and favelas are comprised mostly of a poor, working-class black population. Residents of favelas have "historically been excluded from the labor market, quality education, and participation in the public and political spheres... Favelas are the historical and spatial product of this racialized and institutional exclusion" (Vargas, 2006, p.60). Vargas (2006) argues that the media have perpetuated negative racial stereotypes, and in effect, maintained the status quo of and fed the fears of an elite dominated society who reserve the right to residential fortification and essentially control of their space and control of 'others' for themselves.

Although race and segregation are not the focus of the research at hand, the ideas suggested in these works point at the need to look at how different groups within the population react differently to fear, how they simultaneously protect themselves,

distance themselves, and socially differentiate themselves by accessing and employing residential security measures within the Brazilian urban built environment. *Condomínios fechados* may represent one extreme, the move to a fortified residence, but as an extreme it represents one end of a spectrum or continuum of residential fortification. Are security mechanisms and fortification just a reaction to fear, or are these being used by the elite to maintain dominance and power over other disadvantaged groups? How is this shaping the built environment? Are whites with higher incomes who have never been victimized more likely to use more security mechanisms, or more specifically, high walls and gates? Are security mechanisms used for status and power, and a result of feelings of insecurity in one's neighborhood? And, are security mechanisms inspired by or re-inspiring crime?

Household Security Measures

It may seem intuitive and therefore easy to accept on face value that fear (of crime) leads to certain self-protective responses and behaviors. This relationship is often taken for granted within the literature, despite the fact that empirical evidence exists. This relationship has been well documented in the available research, also identifying victimization and demographic characteristics as typical predictors of crime preventive behavior.

People secure their homes based on an instinctive response to crime and fear of crime and an almost intuitive awareness or knowledge of place-based crime prevention. People's instinctive responses to fear have been recognized within the urban planning field, mainly in North American and Western Europe, and become their own sub-field of place-based crime prevention, combining urban planning with crime and housing studies. The identification of different crime preventive measures within the realm of the

household and the physical environment is rooted in the introduction of defensible space and CPTED.

The principles of Crime Prevention Through Environmental Design, also known as CPTED arise out of Oscar Newman's Defensible Space theory. Newman proposed that "certain kinds of space and spatial layout favour the clandestine activities of criminals. An architect [or urban planner], armed with some understanding of the structure of criminal encounter, can simply avoid providing the space which supports it" (Newman, 1972, p.12). Newman focused mostly on target-hardening of the residential environment where the residents can maintain a sense of ownership over their own safety and security, while highlighting four important dimensions of crime prevention techniques through design: image, milieu, territoriality, and natural surveillance. He recognized that crime prevention measures in homes frequently were taken after the fact by residents, and expressed the need for architects, engineers and urban planners to be active in the process of creating defensible spaces in new housing developments to prevent crime from the get-go (Newman, 1972). Since the 1970s, defensible space theory has been influenced by the "broken windows" theory emphasizing maintenance (Wilson & Kelling, 1982), environmental criminology (Brantingham & Brantingham, 1981), and Clarke's "situational crime prevention" (1995), leading ultimately to Tim Crowe's publication of Crime Prevention Through Environmental Design in 1991.

According to Schneider and Kitchen (2002), design principles and strategies have the potential to reduce both crime and the fear of crime. The goal of CPTED is to deter crime by reducing opportunities for delinquency. The main principles of contemporary CPTED draw from defensible space theory and updated into the following

dimensions of preventive measures: natural surveillance, boundary definition, access control, ownership of territory, maintenance, and the relation between land use and activity locations (Clarke, 1995; Schneider & Kitchen, 2002). The conversation has been ongoing for years, but the literature has focused more on the effects of CPTED and not on the motivators for residents' use and employment of said techniques. The above conceptualization of crime preventive measures is theoretical, and Lavrakas and Lewis (1980) set out to empirically test these dimensions, among others, for validity.

Lavrakas and Lewis (1980) conducted a study examining citizen crime prevention to include several behaviors which "seek to reduce either the chances of victimization or the severity or extent of losses from victimization attempts" (Lavrakas & Lewis, 1980, p. 255). These behaviors were pulled from various previous theoretical studies, including those dimension of prevention suggested in defensible space and CPTED theory. Using frequencies, factor analysis and reliability testing, they analyzed results of four different surveys to create a reliable basis for conceptualization of crime preventive actions. Their findings support four different categories of crime preventive behavior, but to varying degrees: avoidance, access control, surveillance, and territoriality. The access control category includes techniques relevant to this current study, including home security and target-hardening measures, like special window locks/bars and a door peephole. The take-away from this study is the evidence of the need for treating home security measures together and not as independent and separate dependent variables. Lavrakas and Lewis (1980) conclude that the use of a composite index of crime preventive measures is a more reliable and stable measure of

the concept of crime prevention as long as their internal consistency and reliability is measured first.

Crime-preventive actions can be divided into four categories according to Skogan and Maxfield (1981). These four categories form the basis of their research, being personal precaution, household protection, community involvement, and flight to the suburbs. Of particular relevance to this study are their findings on household protection and its relation to fear and victimization. Their US study, focusing on households in urban areas, looked at several household level protections: target-hardening techniques (only including the existence of bars or special locks on windows), surveillance measures (leaving lights on, notification of the police when away, stop mail delivery or have someone bring it in, have a neighbor keep an eye on your home), and loss-reduction measures (property marking/engraving and insurance against property loss/theft).

Correlations measured between household protections techniques and vulnerability (race, income, home ownership, and building size) and crime conditions (previous burglary victimization, neighborhood problems, knew a crime burglary victim) find more vulnerable households do less to protect their household in response to fear. Less vulnerable households (in this case, home-owning whites with higher incomes in single-family homes) take more precautions. These findings were consistent across the four cities in which this survey was conducted. Crime conditions, which includes past burglary victimization, is the only category which is a significant predictor of target-hardening techniques. Ultimately, Skogan and Maxfield (1981) suggest that socio-economic factors may be better explanatory variables of household protective measures

since these present conditions which may limit or promote ability to take preventive action in the household. Although this study only looked at two types of target-hardening techniques, it represents an important point of departure for the development of research in this field.

Often cited for his work on citizen participation in crime prevention, Steven Lab (1990) focuses his research on identifying the different domains and dimensions of crime prevention and the factors within each domain. He also focuses on who participates in crime-prevention activities and how crime-related factors like victimization and fear influence this participation. He separates crime prevention techniques into five different categories or domains, isolating them to show the demographic differences between who participates in which types of preventive techniques. These five domains are personal access control, target hardening, personal security, surveillance, and avoidance (Lab, 1990). Target-hardening, in this case, includes burglar alarms and property marking, while personal access control includes multiple locks and door peepholes. His findings depart from those of Lavrakas and Lewis (1980) in that territoriality is not a dimension, and target-hardening and personal access control become separate dimensions of crime prevention. These dimensions are clarified for the purposes of indicating that different groups of people react to fear of crime in different ways.

Additionally, Lab (1990) explores the relationships between these domains and demographics, fear, and victimization. He finds that demographic variables have minimal impact on victimization and fear of crime, while victimization and fear of crime also have minimal impact on crime-prevention domains. He further states that it is these

demographic characteristics of respondents that actually have the direct effects on crime prevention activities. With respect to target-hardening, the most likely type of person to take these precautions is an older, non-homeowning, highly educated, female in a lower income bracket who has been the victim of a property crime. Personal access behavior is most likely taken by wealthier, non-homeowning, highly educated white people. The consistencies across dimensions and demographics are age, education, and homeownership as the strongest predictors for most prevention measures, with age being the strongest predictor. Race and marital status are found to have little influence on crime prevention participation. The fact that income was not a strong predictor, and that it was surprisingly not highly correlated with either education or home ownership, also departs from Skogan and Maxfield's (1981) suggestion that socio-economic variables are key influencers of crime prevention activity.

It has been established that crime prevention practice is multidimensional, and Giblin (2008) goes on to test the predictive ability of different measures on self-protective behavior (avoidance and personal security measures). He accurately points out, as this current study highlights, that "when considered in empirical research studies, protective behavior is more often included as an independent variable in models explaining criminal victimization (or lack thereof); it is less frequently included as a dependent variable warranting its own explanation" (Giblin, 2008, p.360). He draws on past studies to include awareness of community policing, lifestyles, victimization, neighborhood conditions, and demographic characters as independent variables, expanding on Lab's (1990) prior study while shifting focus to personal crime as opposed to property crime. His findings are still instructive, in that they support those of Lab

(1990), showing that crime preventive behavior is multi-dimensional. His findings show that predictors vary depending on the type of crime and type of behavior being studied.

In an international study from Spain, researchers San-Juan et al. (2012) focus on two outlooks on fear of crime – the influences of socio-demographic influences (or vulnerability) and victimization. They recognize the environmental or ecological influences (incivility and disorder), but choose to focus on victimization and vulnerability, finding that age and sex do have effects on different self-protection behaviors, as does recent victimization. Income and education were found to have no relationship with crime prevention techniques (in this study, includes "active safety" measures of increasing security measures of the home). Older men were more likely to use active safety measures alone, and men were more likely to take no precautions at all. An overall preference for a combination of active safety measures with avoidance strategies was found in women. Their findings support the view that gender is an important consideration in studies on fear of crime and its response in self-protective measures (San-Juan et al., 2012)

Carlos Vilalta has conducted several studies on fear of crime and its relationship to the use of public transportation, gated communities and housing typologies, and home security systems in Mexico City (Vilalta, 2011a; Vilalta, 2011b; Vilalta, 2012). He analyzes official crime data and shows a lack of relationship between fear of crime at home and the use of home security systems. For Vilalta, home security systems consist of burglar alarm systems, special doors/locks, reinforced windows, dogs, tall walls, a security guard or doorman, neighborhood surveillance systems, and informal surveillance systems with neighbors (Vilalta, 2012). He also finds that fear of crime

when at home alone is more likely to be experienced by poor young females. Although Vilalta's research tests the reverse of this study, looking at the impact of security systems on fear at home, it is still instructive in fleshing out the relationship between home security and fortification and fear of crime. The directionality of the relationship cannot be determined, nor can causality. Vilalta also suggests that people may be pointlessly over-fortifying their homes (Vilalta, 2012), especially in light of the fact that in an earlier study, he found that gated communities do not solve the problem of fear of crime. People who moved to gated communities and apartment buildings in Mexico City for the purposes of increasing safety and security did not experience lower levels of fear of crime than those that do not live in gated communities or apartments (Vilalta, 2011a).

In conclusion, the existing literature and research are helpful in guiding the current research on its endeavor to further flesh out the relationship between fear of crime and residential security and fortification in Brazil. It is especially useful when creating a reliable index of home security, as well as with determining the pertinent independent variables which may influence self-protective behavior separate from fear of crime. The following section will explain the methodology for this study in detail, followed by a presentation of the results. The methodology chosen takes into consideration the literature discussed herein, while also taking into account the limitations of data available.

CHAPTER 3
METHODOLOGY

Data

To answer the research questions and to test the hypotheses posed require data

on crime, fear of crime, victimization, behavior and the built environment. Fortunately,

there are data available that is conducive to exploring this relationship further,

specifically that of the Brazilian National Household Sample Survey (PNAD - *Pesquisa*

Nacional por Amostra Domiciliar) carried out by the Brazilian Institute of Geography and

Statistics (IBGE). IBGE conducts national sample surveys every year in Brazil that

include extensive information on socio-economic indicators of individuals and

households.

The PNAD collects information on households in order to study and monitor

socioeconomic development in the country. For the purposes of this research, the

PNAD for 2009 provided the data needed on fear of crime and home security, along

with pertinent socio-economic[1] indicators. In 2009, the PNAD included not only

questions on victimization and justice, but also, for the first time, a series of questions

on household security devices. This dataset from 2009 is advantageous due to the large

number of cases available, with 399,387 respondents, and 153,837 households.

The sampling frame for the PNAD follows three stages of selection based on

municipality, census tract, and housing units. Using proportional probabilities derived

from the 2000 population census, housing units were selected at random to form the

sample for this survey. Because security devices are a household-level indicator, I

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[1] The terms socioeconomic and sociodemographic are used here interchangeably.

limited the analysis to heads of households in urban areas in order to avoid the

overrepresentation of larger households in the results. This data are available at the

national, regional, and state levels, in addition to being available for nine metropolitan

regions in select states.

This data set includes a plethora of variables that are useful when exploring

socio-demographic factors affecting complex issues. The study design for this research

is cross-sectional and non-experimental, using secondary data available from the 2009

PNAD.

In order to limit the sample to households rather than individuals, the variable

"V0401" (position in household) was recoded into "Rel_Head_Hsld", where 1 = head of

the household[2]. Additionally, the variable "V4728" was recoded into a new variable

'Urban_01" where 1 = urban. The sample was filtered by selecting only the cases where

"Rel_Head_Hsld" and "Urban_01" both equaled 1, resulting in 103,963 valid cases of

heads of households in urban areas of Brazil to be used for further analyses.

Variables

The key concepts in this study are residential fortification and fear of crime in the

city. In order to test the hypothesis that residential fortification is influenced by fear of

crime in the city, it was necessary to find a way to directly measure these concepts.

Fear of crime in the city is the primary independent variable, and using the information

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[2] In the PNAD Survey, head of household is referred to as "person of reference." The possible ambiguities in the wording chosen for this question in the survey are recognized, but the researcher has faith in the expertise and thoroughness of the people who conducted the PNAD surveys. The general consensus on not using "head of household" in the survey is that the Portuguese translation has a male connotation and offends feminists.

from the PNAD 2009 Survey, was logically operationalized as the converse of Feelings of Safety in the City.

Primary Independent Variable: Fear of Crime

The PNAD survey did not ask respondents explicitly about their fear of crime. However, an acceptable surrogate for this concept is the question of feelings of safety. The survey did ask if respondents felt safe in their home, in their neighborhood, and in their city. By recoding the responses to these questions into Safety variables (1 = feels safe, 0 = does not feel safe), it was then possible to recode these into their opposites in order to represent fear. It is logical to assume that if a person does not feel safe in their city, then they feel fearful of their city. If a person does not feel safe in their neighborhood, then they must feel unsafe or fearful of crime in their neighborhood. Therefore, the aforementioned variables of Safe_home_01, Safe_neighborhood_01, and Safe_City_01 were recoded into their opposites: Fear_home_01, Fear_neighborhood_01, and Fear_city_01, where equaling 1 meant they did experience the fear in the specified location/area. An additional variable was then created to represent respondents who felt fearful in every location – Fear_Everywhere_01, where the value of 1 was assigned if the respondent had answered that they did not feel safe in any of the locations. Fear_city_01 is as the primary independent variable in this study.

Dependent Variable: Index of Residential Fortification

In the case of residential fortification, the dependent variable, there is no single indicator or variable that can fully measure it. In order to operationalize residential fortification, it was therefore necessary to combine several variables from the PNAD

survey into a composite index of residential fortification, which will be explained

henceforth.

The PNAD survey from 2009 included a new section on Security

Mechanisms/Devices, within which was asked one question with seven yes/no sub-

questions, all relating to whether or not the residence had a certain security mechanism

or mechanisms in order to increase security/safety.[3] These seven security device(s)

options are, in general terms, the following: peephole, extra locks/bars, grates/grills, tall

or electric fence/wall or security alarm, video camera, private security guard or gated

entry, and other. Table 3-1 lists and describes in more detail the security devices

actually used in the analyses, along with the other variables.[4]

After choosing these seven variables for the index, it was important to perform a

reliability test. In SPSS, this was done by calculating Cronbach's Alpha, which is a

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[3] Some might argue that the validity of the index is in question due to the installation and usage of certain security measures as privacy enhancers/providers. The question in the survey asks, specifically, "*Para aumentar a segurança, existe neste domicílio...*" (Instituto Brasileiro de Geografia e Estatistica, 2010). The English translation for this is "To increase security/safety, in this household there is …" It is true that many of these devices have multiple uses; however, the survey question is phrased in a way that reduces any bias or questions of validity.

[4] It is important at this juncture to discuss the limitations of the questions on security devices posed in the PNAD survey. As can be noted in the list above, each sub-question under the security device category on the survey asked about a different number of items at the respondent's residence. The fact that a person could answer "yes" to any question does not actually indicate to the interviewer specifically which of the items in each list the respondents has, or how many they have. This is inherently problematic, because it allows for ambiguous data, and undermines the use of the security index. The security device index assumes that each sub-question represents one security device. It is difficult to do this any other way since the data is not available or measurable at the level of detail necessary within each question. Having more data would provide a more accurate count or index of security devices. However, this study makes use of the data available despite its inherent biases, and works within the constraints of the survey since it is the only data available on this subject.

measure of internal consistency between these variables. Cronbach's Alpha coefficients range from 0 to 1, with values closer to 1 having greater internal consistency reliability. Cronbach's Alpha (standardized) for this index equals 0.558 for the 7-item index, but improves to 0.614 if Grates_01 and sec_other_01 are excluded from the index. This allowed for the highest Cronbach's alpha and most reliable index. The most widely accepted minimum for Cronbach's Alpha is 0.70, however, some may argue that the acceptable range goes lower, since there is no standard. Generally speaking, anything below 0.5 would be unacceptable, and anything greater than 0.60 could be acceptable (Peterson, 1994). Regardless of the indications of this measure, the face validity of these variables as an indication of residential fortification within the specialist community and the literature is reason enough to employ this index for this study.

The residential fortification index was therefore computed into a 5-item index by adding the aforementioned security device variables (Olho_01, Ext_lock_01, Fence_Wall_01, Camera_01, and Pvt_security_01) together into an index variable entitled Sec_devices_index. This index is a count of the security devices in a household[5]. Factor analysis was conducted in order to ascertain that these items in the index did indeed measure only one, not more, concepts or underlying constructs.

Control Variables

The regression models include control variables in order to remove the effects of other variables thought to influence residential fortification. The control variables comprise of age, sex, education, income, race, geographic location, type of residence,

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[5] A weighted index of security devices was created and tested as a result of factor analysis. This index produced similar results to the non-weighted index, and therefore was determined to be unnecessary.

tenancy/type of ownership, and three variables on actual experience of victimization. I chose these variables based on the literature and past research, as these are likely to influence a person's choice to self-protect and their vulnerability, their likelihood of feeling unsafe or being a victim.

Age is a continuous variable, operationalized as how many years a person has lived. V8005 is the survey variable for age which was copied into a new variable, Age.

Sex is a categorical variable, operationalized as the respondent self-reporting as "male" or "female". Sex of the respondent, male or female, is found in V8005, which is recoded into the new variable Gender. A dummy variable was then created for later use in regression analysis, named Gender_01, where male = 1 and 0 = female (reference category).

Education is a continuous variable, operationalized as years of schooling completed by the respondent (V4803). This variable was copied into a new variable named Years_School, to represent education.

Income is a continuous variable, operationalized as monthly household income per capita measured in *reais* (Brazilian currency). Household income per capita was obtained from the variable V4621, which was then computed into the new variable Income_percapitaHsld.

The PNAD Survey offers five categories of race, operationalized as color, by which the respondent may choose to self-identify[6]. The five categories are White,

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[6] Some might argue that Color (of skin) is an unjustifiable or inaccurate measure of "race". However, this research was limited to the information in the PNAD Survey, and the question on "*Cor ou raça*" is the most indicative of, and also the one that would be argued does indeed carry the most face validity as, an operational social (rather than genetic) definition of race.

Brown, Black, Yellow, and Indian. The variable Color was computed into these five categories from V0404. It was necessary to recode these into multinomial dummy variables, so that each Color category could be compared in reference to the White category during regression analyses. White was recoded into white=1 and not-white=0. Black was recoded into Black=1, and not-black=0. This pattern was repeated for the other "colors".

Geographic location is operationalized as region of residence, which is a categorical variable with five options. The survey does not directly ask the respondent what region they live in, so this must be computed based on the other variables. The survey includes data on the state where the respondent lives, with the variable UF. This variable is recoded into the new variable State, which is then recoded into Regions_5Cats by dividing the 27 federal units into their respective regions (1=North, 2=Northeast, 3=Southeast, 4=South, and 5=Center-West). Next, five multinomial dummy variables were created for these regions so that the North region could be used as a reference category when performing regression analyses (e.g. Northeast=0 is respondent does not live in the Northeast and Northeast=1 if respondent does live in the Northeast).

Type of residence is operationalized as whether or not a respondent lives in a house or in an apartment. The choices for the survey question associated with variable V0202 were house, apartment, or room. Room is excluded here because, besides only representing a mere 0.4% of the sub-sample respondents, it also is not the type of residence under study here. V0202 was copied into the new variable House_Apart_Room, and then this variable was used to compute two new dichotomous

variables, House_01 (where house=1, and not in a house=0) and Apartment_01 (where apartment=1, and not in an apartment=0).

Tenancy was also an important variable because it represents investment in the home, operationalized by the type of ownership of the residence, found in variable V0207. The options for this survey question included Owned and Paid, Owned and still paying (interpreted as mortgaged), rented, gifted by employer, gifted-other, and other. This variable was copied into a new variable "Ownership" and recoded into five categories – owned/paid, owned/mortgaged, rented, gifted (the two original gifted categories are combined here), and other. These were then recoded into multinomial dummy variables (OwnPaid_01 = 1 is owned and paid, OwnPaid_01=0 not owned and paid, etc.) so that owned/paid could be used as the reference category when carrying out the regression analyses.

The last variable to be created was victimization. Victimization is a key variable in this research because it can influence a person's decision to use or install security mechanisms inasmuch as it affects a person's experience of fear and safety. There were three variables from the survey chosen to be used in this research for the purposes of operationalizing victimization: V2903 which represented respondents who were victims of attempted robbery in the previous year, V2911 which represented respondents who were victims of theft (no violence/threat) in the previous year, and V2904 which represented respondents who were the victim of a robbery which employed violence or threat in the previous year. Each of these variables was recoded into a dichotomous variable, where 1 = victim and 0 = not a victim.

It is important to note here that these questions only took into account victimization events that occurred in the previous year, and not before. The form of the question introduces a potential bias inasmuch as respondents may still experience the emotional effects of being a victim of a crime even though the incident may have occurred in an earlier time period. It also does not take into account whether the respondent knew someone, be it a family member or close friend, who had been a victim. This is something to consider given that it can affect a person's feelings of safety and fear. Notwithstanding, this is another shortcoming to this data set that must be acknowledged and considered while carrying out this study and analyzing the results.

Data Analysis

Using SPSS statistical software version 17.0, I performed several descriptive and frequency analyses on several variables in order to create a context within which to couch further analyses. Furthermore, the method of analysis I used to test the main hypothesis was ordinary least squares regression. I chose this method because it allows the simultaneous inclusion of several independent variables, both categorical and continuous. This flexibility was key in order to observe the predicted relationship between and effect of Fear of Crime in the City on Residential Fortification, while controlling for several other indicators.

Several ordinary least squares regressions were performed to test the ability of the primary independent variable to predict residential fortification, net the effects of socioeconomic factors. Model 1 regresses the level of residential fortification on fear of crime in the city to ascertain its predictive validity alone. Model 2 adds victimization variables to the model. In Model 3, several socioeconomic control variables were added to the regression model to determine if the primary independent variable (fear)

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continues to have an effect on residential fortification net of the effects of social status. The control variables included in this model were age, gender, income, education, geographic location (region), and race. Dummy variables were used for gender (with female as reference category), race (with White as reference category), and geographic location (with North as reference category). Finally, Model 4 added the variables related to the home - tenancy/type of home ownership and type of residence. Dummy variables were used for both of these variables with Owned/paid and apartment as reference categories, respectively.

To test the hypothesis regarding the most prevalent form of residential fortification (the most prevalent choice of residential security device), the data was analyzed with a simple frequency of responses to the variables regarding existence of different security measures in the home. To address the hypothesis on where fear is experienced the most, a frequency distribution was done on the Fear variables for in the home, in the neighborhood, in the city, and everywhere.

The results of these tests will be discussed in the next chapter.

Tables

Table 3-1. Variable Descriptions

Concept	Variables description	Range
Dependent Security devices	*Composite index* Peep hole; an opening in the door for viewing; a security chain on the door; intercom (yes=1)(no=0) Extra locks, security bars on door/window (yes=1)(no=0) Electric fence; wall or grate/fence higher than 2 meters or with shards of glass or barbed wire; electronic security alarm (yes=1)(no=0) Video camera (yes=1)(no=0) Private security; gated entry (yes=1)(no=0) *Cronbach's Alpha score*=0.614	0-5
Primary independent Fear of crime	Do you feel safe in your city? (yes=1)(no=0)	0-1
Control variables Age	In years	14-109
Sex	Gender (male=1)(female=0)	0-1
Education	Years of school completed	1-17
Income	Per capita household income in *reais*	0-94,669
Race	By color: White, Black, Brown, Yellow, Indian (yes=1)(no=0)	0-1
Geographic location	By region: North, Northeast, Center-West, Southeast, South (yes=1)(no=0)	0-1
Type of residence	House or Apartment (yes=1)(no=0)	0-1
Tenancy	Type of ownership/ownership status: owned, mortgaged, rented, gifted, other (yes=1)(no=0)	0-1
Victimization	Were you the victim of [an attempted robbery / theft / robbery with violence or threat] in previous year? (yes=1)(no=0)	0-1

CHAPTER 4
FINDINGS

General Results

This chapter presents the results of the data analysis as set forth in the previous

section. The sample included 103,963 valid cases of heads of households in urban

areas of Brazil. The age range of respondents (all heads of households) was 14-109

years of age, with the average respondent being nearly 48 years old. Males constituted

63.7% of respondents, with females only representing 36.3%. Education of the

respondent ranged from 1 to 17 years of school completed, with 8.5 years being the

average. A comparison of means for years of school completed can be found in Table

4-1.

This table shows the South and the Southeast as the regions with the highest

average years of school completed, and the North and the Northeast with the lowest

average years of school completed. Figure 4-1 shows that, following regional

demographic trends, the North and Northeast have greater percentages of their

populations with little to no education completed (these regions have high rates of

illiteracy), while the South and Southeast report higher percentages of their populations

completing more years of school.

The Center-West reports a high percentage of highly educated respondents, but

this is likely due to the influence of the capital, Brasília, which is located in the Center-

West region and is the center of governmental and administrative powers for the

country.

Monthly income per capita in *reais* ranged from R$0 to R$94,669. The mean

monthly income per capita was R$832, which was between 1 and 2 minimum salaries in

2009. Figure 4-2 shows the regional distribution of income by deciles, demonstrating that wealth is concentrated in the South and Southeast, and poverty is concentrated in the North and Northeast. A comparison of means of monthly income per capita are shown in Table 4-2, where the highest average is reported in the South, and the lowest in the Northeast.

The majority of respondents were White, representing 51.1% of the population. Afro-Brazilians represented 48.1% of the population (combined, 8.5% Black and 39.6% Brown), with Yellow representing 0.6% and Indian representing 0.3%. The majority of respondents lived in the Southeast at 47.8% of respondents, followed by 22.8% living in the Northeast. This is consistent with the pattern of population distribution in Brazil, with the Southeast being the most populous region followed by the Northeast. 15.3% of respondents lived in the South, 7.6% in the Center-West (including the Federal District of Brasília), and 6.4% in the least populated region of the North.

As shown in Table 4-3, the majority of respondents lived in houses as opposed to apartments, at 87.5% and 12.1%, respectively. The regions of the Southeast and the South stand out, as is evidenced by observing columns 7 through 10 in the table. The percentage of respondents living in houses in the South and Southeast is lower than the national average, and the percentage of households living in apartments is higher than the national average. Furthermore, the majority of respondents (68.4%) also owned and had already fully paid for their residence. The next largest group rented their residence, at 19.4%, followed by 7% who had been gifted their residence and not paid for it. Those who owned but were still paying on the residence (assumed to mean mortgaging their

residence, whether through a private or public loan) were 4.7%, followed by an undefined category of "other" which constituted 0.5% of respondents.

Table 4-4 shows that the majority of respondents had not been a victim of any type of property crime. 86.8% were not victims of an attempted robbery, a robbery with threat or force, or a theft, in the year previous to the survey. Of those, nearly half, 49.2%, still felt unsafe in their city. Nonetheless, 13.2% had been victims, of which 70.7% did feel unsafe in their city. 7.9% had been victims of an attempted robbery in the previous year, 4.6% had been a victim of a robbery where threat or force was used, and 6.2% had been a victim of theft. Not surprisingly, the North had the highest percentage of victims of property crimes, followed by the Center-West (column 1), both above the national average. However, curiously, the South had mostly above average victimization rates (row 5) across types of property crimes, while the Southeast had percentages below the national average for victimization within each type of property crime. It would seem that actual victimization increases the likelihood of a person feeling unsafe in a city, which could be associated with their usage of security devices. This relationship is explored further in the later discussion of the regression analyses.

Regarding where Brazilians feel the least safe or fear their environment the most, the most common response was, as predicted, in their city. Table 4-5 shows the distribution of the responses to the safety questions in the PNAD survey, broken down by region. Interestingly, 43.9% of respondents reported not feeling any fear in their home, neighborhood, or city, representing the largest category of where fear is experienced (column 2, row 5). However, as can be seen in column 2, across the board, people are more fearful the further they are away from their home. Most respondents

reported feeling fear in the city, less in the neighborhood, and less in the home. Regardless of the fact that only around 13% of the population was actually victim of a property crime in the previous year, the percentage of the population experiencing fear somewhere is much higher than this percentage. As distance from the home increases, so does fear of crime. People are less fearful in their home, and more fearful in the city, therefore supporting the theory that fear of crime has latent and residual effects.

Table 4-6 shows the distribution of usage of security mechanisms. It is curious to note that 38.9% of respondents report not using any sort of security mechanism or device to make them feel safer at home[1]. As far as security device preference is concerned, there is an overall preference for grates/grills on windows and doors of residences. At both the national level as well as individually within each major region (row 3), around 40% of respondents reported having this category of security devices (grates/grills). Grates are followed by a magic eye or peephole, at 23.3% nationally (row 1, column 2). However, this is only the second highest category in the South and Southeast. In the North and Northeast, the second highest frequency of choice of security devices is the extra locks category. Tall walls and fences is the third most frequent category, at 21.4% nationally (row 4, column 2). Interestingly enough, this is actually the second highest ranked category in the Center-West, at 24.8% (column 12, row 4). Proportionately, the highest percentage of a regional population using walls and

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[1] It is possible that the respondent owns/uses some other form of residential security device. However, the security mechanisms posed in the questions in the 2009 PNAD survey are fairly comprehensive. It does not include questions about whether the head of the household owns a weapon or a gun that is kept in the home. These are other forms of security that are not taken into account here due to the fact that this research is focused on physical/structural security elements and the manipulation of the built environment and the residence.

fences for security purposes is in the Center-West region. The Southeast is the only region matching the national trend.

Private security guards, cameras, and "other" are much less common security devices nationally, all below 10% frequency of positive responses, reason being that security cameras and private security guards are higher-end security mechanisms. These cost the household more money and higher investment in security infrastructure, and typically would require a household within a certain socioeconomic level. Consequently, the South and the Southeast are above the national average for population percentage (within region) employing private security guards, gated entries, and video cameras.

The security device index allows values on a scale of 0 to 5, given that there are 5 items in the index. 38.9% of respondents had no security devices according to the categories offered in the survey, which is fairly comprehensive in its coverage of security device options, in the opinion of the researcher. The average security device index value indicates that households had 0.7755 categories of security devices at their residence; however, this value is depressed due to the number of respondents scoring 0 on the index. Table 4-7 shows a comparison of means of security device index scores across regions, which is useful for assessing differences in general residential fortification trends.

The South has the highest mean of 0.8977, followed by the Southeast, both being above the national average. The North has the lowest mean score, at 0.5324, which is somewhat surprising given that the North has the highest reported victimization rate. However, income and education play a role in this. The interaction of all of these

independent variables is explored in the following discussion of the results of the

ordinary least squared regression modeling.

Multivariate Analysis

A strong association exists between perceptions of safety and level of home

security/fortification when the net effect of various socio-economic factors and related

indicators are controlled. In other words, fear of crime in the city is a strong predictor of

intensity of residential fortification, as shown through the results of the following

regression models in Table 4-8.

In Model 1, the proportion of variance explained in level of residential fortification

by fear of crime in the city is only 1.3%. By adding victimization variables to the equation

in Model 2, the proportion of variance explained increases to 1.5% (an increase in

0.2%). 0.2% is the amount of increase in explanatory power associated with

victimization, indicating that fear of crime in the city is a stronger explanatory variable in

the model than victimization, however, both are statistically significant and have a

positive effect on the dependent variable.

In Model 3, socioeconomic variables are added to the equation as control

variables. Adding these increases the proportion of variance explained to 21.8%, which

means 20.3% is the explanatory power associated with these variables. Finally, by

adding house-related control variables (tenancy and type of residence), the variance

explained increases to 29.9% by this model. The strength of the model was improved by

8.2, which is the amount of increase in explanatory power associated with these

housing-related variables.

Considering the fourth model, the results are as expected. Increases in age,

years of education, and income increase the index of residential fortification, which

corresponds with the findings on the average victim of a crime in Brazil. It could be logical that since the type of person most at risk in Brazil is a male with increasing age, income, and education, that this would also indicate the type of person to increase fortification in the home.

The type of residence is the best explanatory variable in the equation. By comparing standardized Beta coefficients, living in a house decreases the residential fortification index the most. Income and education are the next best explanatory variables. Not surprisingly, Color is also a telling factor. Blacks have fewer security devices than Whites, and Browns have less but not as few as Blacks, while Yellows have more.

Because a greater percentage of the population in the South and Southeast lives in apartments, and given that the type of residence is a strong predictor of residential fortification, it would be expected that there would be a higher incidence of security device usage in these regions as well. In fact, as previously mentioned, a comparison of means for the index of residential fortification demonstrates the highest mean values for the South and Southeast (see Table 4-7). Further investigation into the type of residence shows that the index of residential fortification varies across tenancy and housing typology combinations. A breakdown of mean values for the security device index by housing typology in conjunction with tenancy status, at the national level, is demonstrated in Figure 4-3.

Quadrant II shows the lowest mean index value for residential fortification (0.5056) by those who rent a home, compared to Quadrant III which shows the highest mean value of 2.2439 for owned apartments. Households in apartments have higher

mean index values than those in houses. These trends are reflected consistently at the regional level.

Model 4 shows a positive relationship between residential fortification and fear of crime in the city. This model is strong and statistically significant, explaining 29.9% of the variance in residential fortification. Each independent variable in this model, except the "Color" Indian, has a statistically significant contribution to the strength and fit of the model. It can be concluded then, that the null hypothesis can be rejected (fear of crime in the city has no influence or effect on residential fortification), and the proposed hypothesis can be accepted: controlling for sociodemographic variables, victimization, and housing-related variables, fear of crime in the city has a positive and significant effect on degree of usage of residential security devices by heads of households in urban areas of Brazil.

Figures
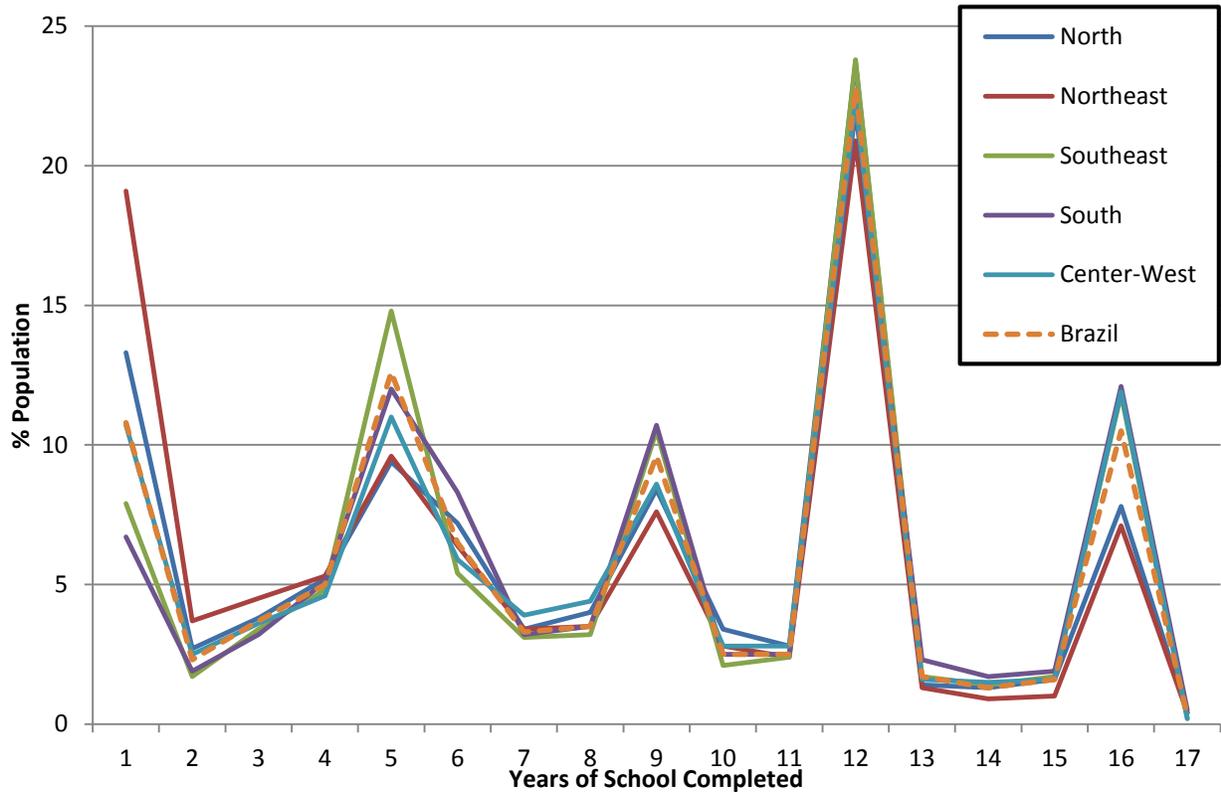
Figure 4-1. Education, Brazil and Major Regions, 2009
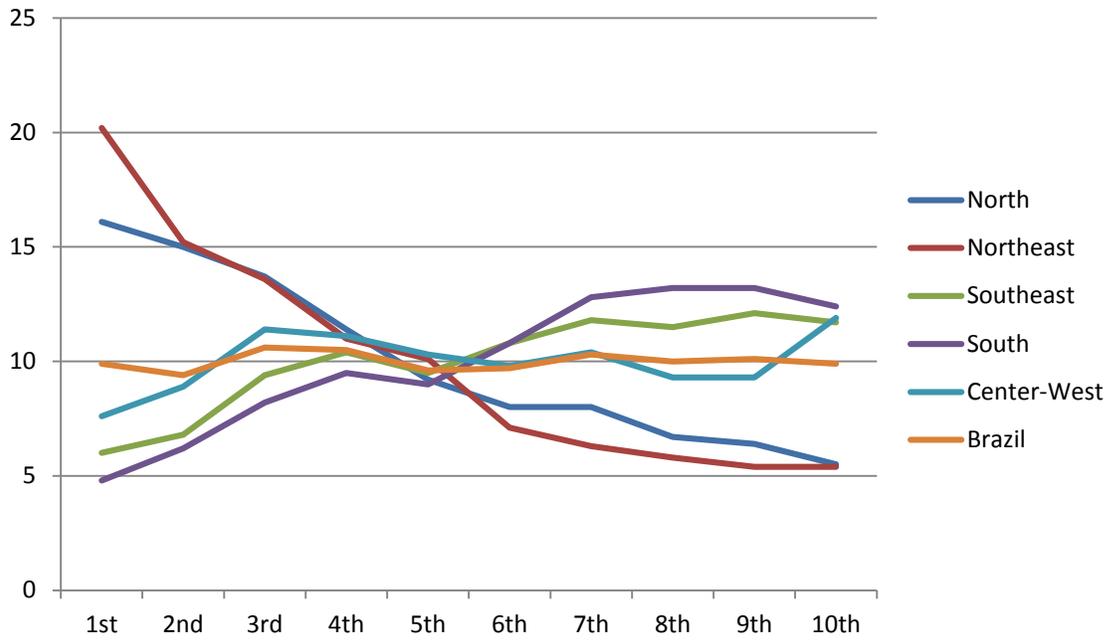
Figure 4-2. Income Distribution by Deciles, Brazil and Major Regions, 2009

Figure 4-3. Mean Security Device Index by Tenancy and Housing Typology, 2009

Tables

Table 4-1. Mean Years Education Completed, Brazil and Major Regions, 2009

Location	Mean	N	Std. Deviation
Brazil	8.4548	103963	4.66187
North	8.1481	6699	4.65075
Northeast	7.3816	23745	4.81467
Southeast	8.8180	49707	4.54667
South	8.9667	15868	4.50099
Center-West	8.6259	7944	4.71020

Source: PNAD Survey, 2009
Note: Sample restricted to Heads of Household in Urban Areas

Table 4-2. Mean Monthly Income Per Capita in *Reais*, Brazil and Major Regions, 2009

Location	Mean	N	Std. Deviation
Brazil	832.63	100541	1411.08944
North	584.37	6546	945.43332
Northeast	568.48	23400	1099.49888
Southeast	935.08	47290	1491.70172
South	965.97	15550	1734.92236
Center-West	947.07	7756	1734.92236

Source: PNAD Survey, 2009
Note: Sample restricted to Heads of Household in Urban Areas

Table 4-3. Type of Residence, Brazil and Major Regions, 2009

Type of Residence		Brazil		North		Northeast		Southeast		South		Center-West	
		N	% of S.P.	N	%	N	%	N	%	N	%	N	%
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
House	(1)	90749	87.5	6358	95.1	21404	90.4	42221	85.1	13635	86.1	7131	89.9
Apartment	(2)	12585	12.1	256	3.8	2191	9.3	7238	14.6	2187	13.8	713	9.0

Source: PNAD Survey, 2009
Note: Sample restricted to Heads of Household in Urban Areas.
Note: Sample Population = 103,963; Valid cases 103,758; 204 missing
Note: N = Number of Cases, % of S.P.=% of Sample Population, %=% of N for region

Table 4-4. Victimization, Brazil and Major Regions, 2009

Location		Victim (N=103964)		Victim Attempted Robbery (N=103963)		Victim Robbery with Force/Threat (N=103962)		Victim Theft (N=103964)	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		%Yes	%No	%Yes	%No	%Yes	%No	%Yes	%No
Brazil	(1)	13.2	86.8	7.9	92.1	4.6	95.4	6.2	93.8
North	(2)	18.1	81.9	10.9	89.1	7.6	92.4	8.2	91.8
Northeast	(3)	14.5	85.5	7.8	92.2	5.8	94.2	6.1	93.9
Southeast	(4)	11.0	89.0	6.9	93.1	4.0	96.0	4.9	95.1
South	(5)	14.4	85.6	9.0	91.0	3.5	96.5	8.1	91.9
Center-West	(6)	15.9	84.1	9.9	90.1	4.5	95.5	8.7	91.3

Source: PNAD Survey, 2009

Note: Sample restricted to Heads of Household in Urban Areas

Table 4-5. Distribution of Fear, Brazil and Major Regions, 2009

Fear		Brazil		North		Northeast		Southeast		South		Center-West	
		N	% of S.P.	N	%	N	%	N	%	N	%	N	%
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Home	(1)	24703	23.8	2168	32.4	6069	25.6	11193	22.5	3170	20.0	2103	26.5
Neighborhood	(2)	37537	36.1	2999	44.8	9548	40.2	17082	34.4	4831	30.4	3077	38.7
City	(3)	54063	52.0	3800	56.7	13506	56.9	25814	51.9	7057	44.5	3885	48.9
Everywhere	(4)	20649	19.9	1767	26.4	5244	22.1	9421	19.0	2465	15.5	1752	22.1
Nowhere	(5)	45600	43.9	2519	37.6	9372	39.5	22037	44.3	8028	50.6	3645	45.9

Source: PNAD Survey, 2009
Note: Sample restricted to Heads of Household in Urban Areas
Note: Sample Population = 103,963
Note: N = Number of Cases, % of S.P.=% of Sample Population, %=% of N for region

Table 4-6. Distribution of Security Mechanisms, Brazil and Major Regions, 2009

Sec. Mechs.		Brazil		North		Northeast		Southeast		South		Center-West	
		N	% of S.P.	N	%	N	%	N	%	N	%	N	%
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Peephole	(1)	24165	23.3	609	9.1	4185	17.7	13538	27.3	4231	26.7	1602	20.2
Ext_lock	(2)	21108	20.3	1571	23.5	4786	20.2	9346	18.8	3896	24.6	1509	19.0
Grates	(3)	42014	40.5	2683	40.1	9315	39.3	21095	42.5	5437	34.3	3484	43.9
Fence_wall	(4)	22197	21.4	1049	15.7	4195	17.7	11230	22.6	3759	23.7	1964	24.8
Camera	(5)	5119	4.9	101	1.5	576	2.4	3151	6.3	888	5.6	403	5.1
Pvt_Sec	(6)	7881	7.6	230	3.4	1621	6.8	4062	8.2	1444	9.1	525	6.6
other	(7)	1518	1.5	47	.7	281	1.2	809	1.6	305	1.9	76	1.0
None	(8)	57288	55.2	4155	62.2	13717	57.9	26803	54.0	8200	51.8	4414	55.7

Source: PNAD Survey, 2009
Note: Sample restricted to Heads of Household in Urban Areas
Note: Sample Population=103,759; 204 system missing
Note: N = Number of Cases, % of S.P.=% of Sample Population, %=% of N for region
Note: Peephole = peephole; an opening in the door for viewing; a security chain on the door; intercom; Ext_lock = extra locks, security bars (of iron or wood) on the door/window against break-ins; Grates = Grates bars/grills on window/door; Fence_wall = Electric fence; wall or grate/fence higher than 2 meters or with shards of glass or barbed wire, electronic security alarm; Camera = Video camera; Pvt_Sec = Private security; gated entry.

Table 4-7. Means of Security Device Index by Region, 2009

Regions	Mean	N	Std. Deviation
North	.5324	6684	.81478
Northeast	.6487	23683	.94217
Southeast	.8328	49622	1.13558
South	.8977	15839	1.17563
Center-West	.7571	7929	1.07644
Total	.7755	103759	1.08303

Source: PNAD Survey 2009
Note: Sample limited to Heads of Household in urban areas

Table 4-8. Level of Residential Fortification Regressed on Fear of Crime in the City and Selected Indicators: Brazil, 2009 (OLS regression coefficients)

Independent Variables		Model 1	Model 2	Model 3	Model 4
		(1)	(2)	(3)	(4)
Constant	(1)	.636	.626	-.394	.765
Age	(2)	-	-	.006	.005
Sex					
Female (ref)	(3)	-	-	-	-
Male	(4)	-	-	-.006*	.022
Years of School	(5)	-	-	.065	.050
Per Capita Household Income	(6)	-	-	.000	.000
Race					
White (ref)	(7)	-	-	-	-
Brown	(8)	-	-	-.151	-.128
Black	(9)	-	-	-.182	-.169
Yellow	(10)	-	-	.445	.367
Indian	(11)	-	-	-.077*	-.068*
Region of Residence					
North (ref)	(12)	-	-	-	-
Northeast	(13)	-	-	.152	.104
Southeast	(14)	-	-	.120	.065
South	(15)	-	-	.159	.108
Center West	(16)	-	-	.101	.092
Type of Residence					
Apartment (ref)	(17)	-	-	-	-
House	(18)	-	-	-	-.982
Tenancy/Type of Ownership					
Owned/Paid in Full (ref)	(19)	-	-	-	-
Mortgaged	(20)	-	-	-	.201
Rented	(21)	-	-	-	-.151
Gifted	(22)	-	-	-	-.131
Other	(23)	-	-	-	-.086
Theft					
Not Victim (ref)	(24)	-	-	-	-
Victim	(25)	-	.036	.015*	.032

Table 4-8. Continued

Independent Variables		Model 1	Model 2	Model 3	Model 4
		(1)	(2)	(3)	(4)
Robbery with Force					
Not Victim (ref)	(26)	-	-	-	-
Victim	(27)	-	.071	.059	.046
Attempted Robbery					
Not Victim (ref)	(28)	-	-	-	-
Victim	(29)	-	.159	.102	.094
Crime in the City					
No Fear (ref)	(30)	-	-	-	-
Fear	(31)	.244	.230	.168	.127
R^2	(32)	.013	.015	.218	.299

Source: PNAD Survey 2009
*Not statistically significant.
Note: Sample limited to Heads of Household in urban areas
Note: Coefficients statistically significant at less than .05 unless otherwise noted.

CHAPTER 5
DISCUSSION AND CONCLUSION

This study supports the findings of Lab (1990) and Giblin (2008) by empirically showing that crime preventive behavior is multi-dimensional. This study tests the dimensions of fear of crime, victimization, and socio-economic variables on crime preventive behavior in the household, finding that socio-economic factors are the strongest predictor of this type of behavior, in support of past findings by Skogan and Maxfield (1981) and Lab (1990). Moreover, while fear of crime and victimization are positively correlated with this behavior, they are of minimal yet significant impact, paralleling the findings of Lab (1990).

Due to the nature of the survey questions, it is difficult to categorize the different security measures listed. The security measure questions encompass various measures that sometimes overlap dimensions of access control, surveillance, and target-hardening. Many of the measures in the security device index are target-hardening techniques, and all three major correlates of fortification were found to be statistically significant predictors. This differs from Skogan and Maxfield's (1981) research that found victimization to be the only statistically significant predictor. This may highlight the difficulty of research in this area due to the fact that all surveys are different, using different groupings of security measures as well as oftentimes different operationalizations of fear of crime.

Many Brazilians do not use any security devices for their home, representing 38.9% of the population. This could be due to the fact that some people feel safe, and others may not have the resources or means to access these devices. Conversely, some people may have some of these measures, but the survey questions may be

asked in a way that is confusing. If I live in an apartment, I do not have a fence by nature of the fact that an apartment is a unit within a building. But, the apartment building may have its own fence or wall, or even a video security camera. And, one person may say in this case that they do have a fence or wall or camera, and another might have the perspective that they do not. It is difficult to ascertain consistency of responses as survey questions may be interpreted differently by different people. So, there is an inherent bias in the results of this survey and respondents' preferences for security devices, due to respondents' perceptions and interpretations of their built environment as well as of the survey.

Nevertheless, it is essential to mention that tall walls/fences and security alarms are the third most preferred group of security devices within the index. 21.4% of Brazilians have either a tall wall/fence over 2 meters tall and/or an electronic security alarm. The literature on the matter, in combination with my personal experiences and observations in cities in Brazil, led me to believe walls and fences were more ubiquitous than this. The Center-West has the highest rates of tall walls/fences and security alarms, and this could be due to the impact of the federal capital, Brasília, where important government officials may feel the need to have more privacy and security at their residence. The most ubiquitous security devices are in fact grills/grates on windows and peepholes and security chains on doors. This may not actually represent a preference, but the fact that these devices are cheaper and more accessible, and possibly have become a normative part of building and home housing design. Private security guards, gated entries, and video cameras, all presumed to be part of what might constitute a gated condominium, each represent less than 10% of the

population's preference. Again, these rates were expected to be much higher given the attention in the literature to fortification and the spread of gated condominiums. Problematic is the fact that there is no previous number or rate to which to compare. Given that these last categories represent more expensive modes of self-protection, it is not surprising that these are highly represented in the South and Southeast regions where wealth is concentrated.

The findings of this study within the dimension of socio-economic variables somewhat contrast with the findings of the study done by San-Juan et al. (2012) in Spain. My study finds increases in age, education, and income to be strongly and positively correlated with levels of home security. These were the strongest socio-economic predictors. In contrast, San-Juan et al. (2012) found victimization and age and sex to be the only variables positively correlated with crime preventive behavior, while income and education had no relationship. Lab (1990) found age to be the strongest socio-economic factor, along with education and tenancy (non-homeowners were more prone to self-protective measures in the home). This current study distinctively finds housing variables to be important and significant factors (including tenancy), while type of housing is the strongest factor. This is followed by socioeconomic indicators, with the strongest predictors being income and education, which may give credence to the views of Caldeira (2000), Vargas (2006), and Rial and Grossi (2002) that residential fortification is a means by which the elite socially differentiate themselves. This is further supported by the findings of the security devices related to race. Blacks are more disadvantaged than Browns, who are more disadvantaged than Whites in terms of household crime prevention measures. The fact that wealthier, whiter, and more

educated heads of household choose to have more home security may reflect on the theme of residential segregation. Residential segregation could go beyond spatial divisiveness to differences in housing quality and typology, and even in access to safety and security at home. Because of the social inequality in Brazil and the history of socio-spatial segregation, it is not surprising here that income and education, highly correlated, both have a positive relationship with security measures.

The fact that type of residence is the best explanatory variable in this model has a possible explanation. The highest populations are in the Southeast where the largest cities are, and with increasing urban densities of more people per hectare, the problem of scarcity of space begins. High-rise apartments and condos may have become a necessity in this region. The fact that apartments are more likely to have security devices than homes, coupled with more people living in apartments than homes in the South and Southeast, may have an impact on the fact that the highest security device index measures are in the South and Southeast. I give attention to this issue since victimization rates are highest in the North where people are more vulnerable to crime.[1]

Using the data presented by Wood and Ribeiro (2013), the vulnerability theory of predicting crime preventive measures would indicate that the highest levels of home fortification would be associated with males in the North who are wealthier and more

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[1] It may appear that certain results, upon comparison, seem contradictory (for example, Tables 4-5 and 4-7). However, this is due to what is known as the '"ecological fallacy." According to the Encyclopedia of Survey Research Methods, the "ecological fallacy" is "a type of faulty reasoning… that occurs when data… at a group or aggregate level are analyzed and interpretations are then made (generalized) as though they automatically apply at the level of the individuals" (2008). In other words, "just because it was found to exist at the aggregate level does not assure that it holds at the individual level" (Lavralcas, 2008), although it is possible. It is important to keep the "ecological fallacy" in mind when interpreting results of social science research and statistical analysis.

educated. The findings in this study diverge from this slightly, because the wealthier and more highly educated populations reside in the South and Southeast and those are the regions with the highest security device index means. Victimization was found to play a small role in predicting fortification, therefore this finding is not surprising. Still, consistent with vulnerability theory is that males are more likely to be victims of crime and also more likely to have increased security than females. This could possibly be explained by women's preference for avoidance strategies over protective measures (San-Juan et al, 2012), and also by the gender ratio in that there are more male-headed households than female ones. Additionally, although Wood and Ribeiro's (2013) findings found minimal differences in victimization by race, the category of Brown was still found to be more vulnerable. So, it would have been expected that there would be either no difference in security measures across race, or that Browns would be more likely to secure their homes more than Blacks and Whites. But, in fact the Yellow and White categories are more likely to have increasing home security.

While crime and fear of crime are still spreading in Brazil, it is important to note that fear of crime is a stronger predictor of crime preventive measures of the household in this model than actual victimization, reinforcing the concept that more people experience fear of crime than are actual victims of crime (Skogan & Maxfield, 1981). This may explain the minimal increase in variance explained when the victimization variables are added to the model. This, coupled with the findings that a majority of Brazilians have not been the victim of a recent property crime yet nearly half of them experience a fear of crime in their city, also supports the view that a culture of fear prevails in Brazil (Caldeira & Holston 1999; Caldeira, 2000).

Although 43.9% of Brazilians do not experience any fear anywhere, the majority (52%) experience fear of crime in their city, feeling more unsafe here than in their homes or neighborhoods. The lower number of people experiencing fear of crime at home and in the neighborhood makes sense since a person's home is their proverbial "sanctuary" or safe place away from the chaos of the outer world. Also, if one has security devices, they might be given a sense of safety within their home (this is logically the desired effects of fortification and home security). Likewise, neighborhood safety could be influenced by social cohesion and levels of community involvement, or if the person lives in an expansive gated community and their neighborhood is bounded and controlled, thereby giving a false sense of security (Coy & Pohler, 2002). Looking at effectiveness of security devices, and other indicators like social cohesion and environmental disorder and their impacts on fortification, suggests areas for future research (Bannister & Fyfe, 2001; Scarborough et al., 2010).

It should be noted that this research is limited by the fact that it is a cross-sectional study based on data from one point in time. Therefore, one of the main drawbacks to this study is the inability to include in the analysis the influence of time order in crime-prevention responses. The results of this study are likely susceptible to the implications of the victimization-fear-crime-prevention relationship, which could alter the influence of both fear of crime and victimization on crime-prevention measures of the home (Lab, 1990). The nature of one survey done at one point in time without supplementary questions does not allow for the researcher to know the sequence of events. Since only the previous twelve months were included for victimization, it is possible that there were previous victimizations and fear beyond this time frame that

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instigated the installation of security devices. Resultantly, these devices might have lessened future victimizations and fear.

Another aspect of this time-order conundrum is the relationship between the household head and the actual installation of security devices. It is entirely plausible that a respondent bought or rented a home which already had these devices installed, meaning those devices are potentially independent of the household head's perceptions and behaviors. But, did the existence of these devices influence their choice to buy or rent that specific home stemming from their already existing insecurities and fears? This relationship is tenuous and difficult to explore with the available data and the limited questions.

Future research would do better to incorporate more detailed surveys inquiring about the direct relationship between household head and the installation of certain security devices, or the motivations for moving into an already secured location. Furthermore, I recommend in the future that another special survey on victimization, justice, and home security mechanisms be conducted by the IBGE for the purposes of allowing the chance to do an analysis of change over time in usage of security mechanisms and perceptions of safety. This survey may be the same in structure for the purposes of consistency and easy comparison, or could be augmented for the purposes of elaborating a better, more nuanced version of the survey. Disaggregating the list of home security measures while also expanding on them to include more mechanisms across more CPTED categories would make future data and studies more comprehensive.

This study specifically focuses on the ability of fear of crime in the city, in addition to victimization and socio-demographic characteristics, to predict crime prevention behaviors of the home. Some may argue that the order of the relationship is the reverse, that behavior may precede this fear due to the fear feedback loop (Liska et al., 1988) or the causality dilemma of fortification and fear of crime. However, this is more likely the relationship for avoidance techniques, yet entirely plausible, however beyond the scope of the available dataset and this study.

This study has focused on fear of crime operationalized as a person's personal and individual perception or sense of safety/security in their city. As mentioned previously, the operationalization of this concept of fear has been varied throughout the literature. One aspect of fear for consideration that may have biased the results is the difference between personal fear and altruistic fear as discussed by Warr and Ellison (2000). Although personal fear, that which is the basis of the survey questions used as a basis of analysis in this study, has proven to be a determining factor in taking home-security measures and making behavioral changes in daily life, altruistic fear, or a fear or concern for the safety of others, is a frequent and often the only determinant for these responses (Warr & Ellison, 2000). This highlights a limitation of this study but also a consideration to be included in further research. Future surveys about home security and victimization in Brazil would possibly be improved by asking more and further varied questions about fear, perceptions of risk and safety, worries and anxieties, and also by including more control variables like number of elderly or children living in the household and marital status.

When people lack a sense of safety, there is an inherent threat to quality of life, democracy, openness, and freedom in society. People inherently react to feelings of insecurity and fear by protecting themselves in one way or the other, one way being self-protective and crime preventive measures in the household. Besides fear of crime victimization and socioeconomic factors influence a person's choice to secure the home and the level to which they will do so. Crime preventive behavior is clearly multi-dimensional, and future research could explore more options that may influence this behavior to improve the model here.

This study has provided additional insights into the state of home security and fear of crime in the Latin American context, specifically in urban areas of Brazil. This research has implications for the fields of criminology, urban planning, and Latin American Studies. It contributes to the body of literature on the relationship between the built environment, namely residential fortification, and fear of crime in Latin America. It supports the theory that fear of crime is an important and significant motivator behind residential fortification, while highlighting the greater importance of socioeconomic variables in this relationship. If social inequalities continue to grow, there will continue to be differences in access to and use of home security devices by different groups of Brazilians.

This study also stresses the need for further investigation on this relationship and exploring other stimuli of crime prevention measures in the home realm. Improved survey and measurement techniques also need to be given attention. Apart from this, future research in the same vein as Vilalta (2012) is needed on measuring the effectiveness of these security measures and CPTED-related techniques in actually

reducing fear of crime in Brazil and Latin America. Is this shift in the design of the built

environment actually effective in reducing fear? Fear has negative consequences for

quality of life and development, of both people, cities, and nations, and it is important to

understand the relationship between these elements to make important improvements.

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BIOGRAPHICAL SKETCH

Sarah received her Bachelor of Arts with a double-major in both Latin American Studies and Spanish from the University of Virginia. In 2010, she began graduate school at the University of Florida. Through fellowships, assistantships, research, teaching, and student organizations, she divided her time between the Center for Latin American Studies, the Department of Urban and Regional Planning, and the Department of Spanish and Portuguese. Sarah spent four summers in Brazil studying, traveling, doing research, and being a TA for a study-abroad program. She majored in Latin American Studies and graduated with a Master of Arts degree in the spring of 2014, concurrently with a Master of Arts in Urban and Regional Planning.