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SITUATIONAL FACTORS IN HOMICIDES IN A VIOLENCE-RIDDEN BRAZILIAN
FAVELA

by

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ABSTRACT

Situational Factors in Homicides in a Violence-Ridden Brazilian Favela

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This study examines how and why situational factors can create opportunities for young males, mostly those involved in local drug trafficking, to commit homicides with impunity in the Brazilian favela of Alto Vera Cruz (AVC). The study shows how these factors can make murder easy to get away with in certain places, by imposing obstacles that hinder formal and informal mechanisms of control and prevention. Primary data in this study are based on systematic observation of situational features of 100 addresses where homicides had previously been committed in the AVC favela, between 2000 and 2006, and of 100 corresponding addresses in the same favela where no homicides were committed. The data analysis is performed using a matched case-control study in which the traits of specific geographical locations are studied rather than people. The study is unusual in the field of Criminology, in that it exhaustively analyzes the social and geographical characteristics of places in which homicides were committed by using exploratory spatial analysis techniques, and by incorporating the spatial autocorrelation component in the conditional logistic regression model. The results of the regression analysis show that homicides are more likely to occur in specific settings that both make it easier for criminals to get away with their crimes, and reduce the amount of effort they need to expend in order to evade capture. These settings are characterized by the sale of illegal drugs, proximity to bars, the preponderance of hiding places and escape-routes, and an irregular urban landscape that helps limit surveillance by residents and the public. The findings of this study help encourage alternative responses for the violence that is common in favelas, expanding and complementing existing crime prevention strategies by removing or reducing criminals' opportunities to commit crimes, a key facet of the specialty field of Environmental Criminology.

PREFACE

The research in this report focuses on the role of situational factors in homicides. There are two reasons for the interest in researching this topic:

First, studies on homicides have focused on a range of different approaches associating homicide to various causal factors such as age, sex, social-demographic factors, personality traits, drugs, culture and gangs, and opportunity factors as well, for example, guns availability, but few studies have explored the situational opportunities that favor certain places over others when criminals consider killing. This may be due to the common opinion that opportunities are relevant in explaining property crimes only, rather than “expressive” crimes such as homicides. Another possibility is that exploring opportunities for crime is a very difficult task due to the lack of data. It is rare that police collect and catalogue data systematically for opportunity factors related to crime scenes. On the rare occasions when this data is collected, it is usually used to catch criminals rather than as a help in understanding crime patterns. As a result, the data is rarely used to design crime prevention policies that aim to intervene on opportunities for crime. Therefore, researchers have to collect their own primary data. This is a complex and time consuming task that may discourage most researchers.

The second reason to investigate situational factors as they affect the commission of homicides can be summed up by environmental criminology’s main principle, “opportunity makes the thief.” This axiom help sum up the

approach of thinking more broadly with crime prevention policies that go beyond police intervention. Studies have point out many methodological problems in demonstrating the relationship between police response and crime prevention and reduction. Crime statistics traditionally used to measure police efficiency in responding to crime are unreliable because statistics measure only crimes that are reported. Even homicide statistics and victimization surveys which appear more reliable have methodological limitations. Scientifically measuring crime is a complex task. Clearance rates that are based on the number of arrests divided by the number of reported crimes are artificial. As David Bayley (1968) states, clearance rates measure what the police do to control crime – catch criminals – rather than gauge whether the police actually prevent crime. In addition, environmental criminologists show that criminals are only one component of measuring crime, along with measurements involving victims and victimization, and places where crime occurred. However, public policy makers continue to myopically expect that the exclusive responsibility of preventing crime rests on the shoulders of the police.

In order to change this thinking, it is crucial to shift focus away from the broader concept of criminality to crime events themselves in order to help policy makers, criminal justice practitioners and crime analysts plan more practical crime prevention strategies such as those envisioned in the discipline of Environmental Criminology. This shift would allow policy makers and specialists who study crime patterns to focus not only on how and why crime occurs but also on alternative intervention measures based on the situational factors that

encourage criminals to commit crimes. Based on these less conventional views of crime analysis, the current study explores the situational factors in homicides in the volatile environment of a Brazilian favela called Alto Vera Cruz.

To Edson and Joana,
my family, and my husband, Roberto.

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INTRODUCTION

Homicide is one of the biggest problems large Brazilian cities face. Homicides committed with firearms and that involve young men and adolescents who live in impoverished shantytowns known as favelas (Zaluar, 1984) are an especially serious national concern. While the problem of young people in poor areas shooting and killing each other is common in vulnerable parts of urban areas across Latin America (Silveira, 2007), it long ago reached crisis proportions in Brazil, the region's most populous country.

In the 1980s, pioneer studies on violence in Brazil showed that homicides, contrary to other types of crime such as property crime, are largely confined to the poorest areas of regions and cities (Beato, 1998; Batittuci, 1998; Beato and Reis, 2001.) However, these studies revealed that the increase of homicide rates in favelas is not related to the problem of poverty in itself, but to the growth of drug markets, together with the easy availability of firearms for impoverished young men involved in the local drug trade and other criminal activity in these areas (Zaluar, 1984; Beato *et al.*, 2001; Beato, 2003).

Although favelas per se are not the cause of the violence, the escalation of homicides in certain favelas is frequently reported on T.V. news programs and in other media, strengthening the public perception that favelas in general are dangerous places.

GOALS

The main goal of this study is to analyze the spatial patterns of homicides in a Brazilian hot spot favela, and to explain how and why such crimes occurred in certain locations in the favela. The general hypothesis is that features of places where homicides occur play an important role in making some places more prone to the commission of homicides than others.

This study compares in detail situational features in specific addresses inside the observed favela where homicides occurred and in other addresses in the same favela where no homicides were committed. The study posits that immediate situational factors, such as lack of guardianship by residents and the public, the prevalence of drug trafficking, and the presence of bars and interconnecting alleys are the main predictor variables in creating opportunities for homicides, since they reduce the risks and obstacles potential offenders might otherwise face that could cause them to think twice before committing murder. Therefore, the main concern of this study is with places where homicides were committed, rather than the larger social and environmental units of analysis such as the favela itself.

THEORETICAL FRAMEWORK

From a theoretical standpoint, this study can be classified as Environmental Criminology, a specialization which includes the Routine Activity theory, the Rational Choice Perspective, the Crime Patterns theory and the Situational Crime Prevention approach. The core principle of Environmental Criminology is that opportunity makes the thief – that is, it is more useful to study the situational features of the places where crimes are committed and the specific characteristics of suitable targets than to study the personality traits, social features and dispositions of the individuals who commit the crimes. The innovation in this approach is its focus on criminal behavior as a result of rational decisions and choices that motivated offenders make after they evaluate immediate opportunities to commit the crime and to calculate the costs and benefits of committing it (see Felson and Clarke, 1997.) In this sense, motivated offenders, decide to commit their crimes in one place rather than another, and to victimize a certain target rather than another, during the course of their daily routine activities. This assumption has an important impact on the emergence of situational crime prevention measures that were originally introduced in the 1980s. According to this concept, the first step that must be taken to reduce crime begins with examining the opportunity structure (the immediate situational components) of a specific crime situation (Weisburd, 1997).

Important studies on violent crime have shown strong evidence of the association between situational factors and crime, such as homicides and gun availability (Lester and Murrell, 1981, 1982), as well as the similarities between the lifestyles and routine activities of victims and offenders (Pizarro *et al.*, 2007). Studies have also shown that situational crime prevention measures that focus on increasing the risk a potential offender would have to overcome and the effort he would have to undertake in order to commit the crime – and which subsequently may reduce the offender's potential reward – are more cost effective than attempting to change structural social factors, institutions or individual behaviors (Cerqueira *et al.*, 2007).

In addition, empirical studies, such as Brantingham and Brantingham, 1994, have underscored the value of environmentally-focused interventions and other situational measures in reducing several types of crime such as suicides, burglaries, robberies, car thefts, drug traffic as well as serial murders.

One of the experiments that used situational measures to look more carefully at factors effecting homicide was conducted by Lasley (1998) to reduce gang-related homicides in high-crime neighborhoods in Los Angeles. This study revealed that the implementation of traffic barriers to prevent access to these areas showed that small changes in the situations in which gangs perceive opportunities to carry out “hit-and-run” crimes such as drive-by shootings were effective in reducing murders (Lasley, 1998:2).

All these empirical studies have contributed to making Environmental Criminology a scientific discipline, changing the focus of the debate from why certain individuals commit crimes and others do not to how and why crimes occur in certain places and not in others.

Although scientific researches on the occurrences of violence in Brazil have tried to understand and explain temporal and geographic homicide patterns in certain regions, cities, neighborhoods, police districts and even favelas, these studies have not made much progress in analyzing why homicides tend to occur in specific places in high-risk crime areas. Based on census data, these studies have focused on describing structural socio-demographic characteristics of the broad studied area without taking into account the uniqueness of features that characterize crime clusters. No empirical research in Brazil has explored the relevance of environmental cues and situations that may create opportunities for homicide to be committed in specific settings in any detail. As a result, a fertile research field on homicides and situational factors in favelas considered dangerous remains unexplored.

RESEARCH DESIGN

The research site of this study is the Alto Vera Cruz (AVC) favela that was identified in 2003 as a hot spot of homicides in Brazil's third largest city, Belo Horizonte, the capital of the state of Minas Gerais.

The research design contains two parts. One is the exploratory spatial analysis which examines the spatial distribution of homicides in the favela, taking into account the spatial auto-correlation component and the second is the matched case-control study of addresses with and without homicides.

This study uses primary and secondary data. Primary data are based on systematic observation of situational features of 100 addresses in which at least one homicide was committed between 2000 and 2006 in the AVC favela and 100 corresponding addresses where homicides were not committed in the same favela. These locations are the main units of analysis in this study.

Secondary data include homicide statistics obtained from the Homicide Division of the Civil Police in the State of Minas Gerais, as well as official information on drug areas and drug selling spots provided by the Military Police in Belo Horizonte.

In addition, the statistical model includes a descriptive analysis of 100 matched pairs of homicide and control addresses and the results of McNemar's test. The odds of the relative risk of homicides in certain places in the AVC favela are also computed by a conditional logistic regression model that incorporates spatial lags as the control variables.

POLICY IMPLICATIONS

The results of this study may contribute to the design of alternative policies for homicide control and prevention, in addition to more conventional responses that already exist. The policies presented in this study include a series of opportunity-reduction measures that differ from traditional crime prevention responses that usually focus on the social causes that motivate offenders to offend as the core element of this complex problem.

Traditional responses to crime focus on detention of offenders and the implementation of rehabilitative measures in order to tackle the “causes” of homicides. Crime prevention programs have included a broad range of repressive and social mechanisms to reduce violence. In Brazil, these programs have combined, repressive police crackdowns on violence-ridden favelas and criminal-justice interagency responses aiming at locking up offenders or repeat offenders. Another strategy has been to dismantle gangs and deter them from committing violence with community-based preventive measures such as community policing and community-oriented initiatives that empower residents and attempt to prevent young adults and adolescents from participating in crime, whether or not they have been involved in criminal activities.

Despite the impact that these approaches might have on reducing homicides, they have neglected to address a core aspect of the crime equation – the immediate situational factors that structure the context in which crime occurs.

Analyzing such factors might contribute to more practical and precise crime prevention responses that change the offenders' perceptions of the opportunities for crime, thus impacting their rational decision-making process about the costs and benefits of their criminal act.

NEXT PARTS

This study is comprised of four parts. Part I includes 3 chapters. Chapter 1 and 2 describe the homicide problem and how officials and criminal justice practitioners have tried to reduce it with scientific research and crime prevention policies in Brazil and the city of Belo Horizonte. The main goal is to look at the problem of homicide broadly, and then to place it in the specific context of the Alto Vera Cruz favela, as it will be described in the next chapter.

Chapter 3 begins with a brief description of how and why the Alto Vera Cruz favela was chosen as the place to explore the relevance of situational opportunities for homicides. Next, it describes the favela, presenting a temporal and geographical analysis of homicide patterns inside its area. In addition, it relates the reality of violence in the AVC favela through narrative accounts provided by criminals who operate within and the police who patrol there. These narratives are part of a preliminary attempt to explore the nature and dimension of the homicide problem, and to show how this study took shape based on the stories of those who live and work in the favela. .

Part II of this study comprises of the Chapter 4 that is a review of the literature available on different criminological approaches to the importance of the environment for explaining crime. This chapter presents the main assumptions of the ecological theories of the Chicago School of Human Ecology, the Broken Windows Theory, and, more predominantly, the discussion of emerging theories for crime namely Environmental Criminology. The review of this literature is crucial as it sheds new light on the study of homicides in the context of favelas.

Part III of this study includes Chapters 5, 6, and 7. Chapter 5 describes the research design. Chapter 6 presents an exploratory spatial analysis of homicide patterns in the Alto Vera Cruz favela, including a point pattern analysis of the distribution of homicide locations, as well as an investigation of the auto-spatial correlation component. Chapter 7 discusses the matched case-control study and its findings.

Part IV is comprised of two chapters: Chapter 8 that examines the methodological limitations and theoretical and research strengths of this study and Chapter 9 that presents the main policy implications.

Finally, this study presents the conclusion, indicating some themes for a future research agenda.

I

THE PROBLEM OF HOMICIDES

1**THE PROBLEM OF VIOLENCE IN BRAZIL**

The escalation of serious crime in urban areas is one of the most pressing social problems in Brazil, a country with one of the world's highest homicide rates. According to the 2002 World Report on Violence and Health published by the World Health Organization (World Health Organization, 2002, Geneva), Brazil has the fourth highest homicide rate with 32.5 murders per 100,000 inhabitants; Colombia tops the list, with 84.4 homicides per 100,000 inhabitants, trailed by El Salvador, with a rate of 50.2, and Puerto Rico at 41.8 homicides per 100,000.

Since the 1980s, homicide rates in Brazil have escalated dramatically, from 15 deaths per 100,000 people to 32 deaths per 100,000 in 2000 (World Bank Report no 36525, 2006). An analysis of homicide trends shows that over 584,000 homicides were committed in Brazil between 1980 and 2000, of which over 70% were committed between 1990 and 2000. In the 1990s, homicides accounted for 38% of all causes of death other than natural causes, including labor accidents, suicides, drowning, and falls (Brazilian Ministry of Health, 2007, Report on the Evolution of Mortality by Violence in Brazil and its Regions).

In the century, Brazil continues to be one of the leaders in worldwide violence. Between 2000 and 2003, homicide rates in Brazil increased 8% per 100,000 inhabitants. By 2003, there were 49,808 deaths, which corresponded to 28 deaths per 100,000 inhabitants. Homicide was the main cause of death,

accounting for 39% of all “external” causes of death (Report on Health in Brazil, 2005). In 2006, public security and crime and unemployment were the main priorities for voters during federal public elections (Kingstone, 2006), and public debate on these issues continued during the municipal elections in 2008 (Osava, 2008).

The increase in violence and crime has not only threatened the Brazilian public's feeling of safety, it has also brought fear to communities. Consequently, it has resulted in significant psychological and social costs for individuals, families, and entire communities. People tend to change their behavior, abandon their neighborhoods, and paying significantly more for private security. The increase in violence and crime inhibits economic investment by internal and global industries, limits commercial activities and brings down real estate values (Kahn, 1999; Cerqueira *et al.*, 2007).

In the last decade, the increasing cost of crime and violence in Brazil has placed a considerable burden on public institutions. In 2004, the cost of violence accounted for over 5% of the Gross National Product, including increased public health expenditure, expenditure on the social security system police, prosecution services, courts, correction, crime prevention programs, and insurance expenses (Cerqueira *et al.*, 2007). The high mortality rate among young people also has a direct impact on productivity, on account of the loss of human capital. All of these factors have caused significant drops in both international and national tourism, curtailing the development of the country's economy as a whole (Kahn, 1999;

Cerqueira *et al*, 2007). The impact that crime may have on Brazil's wealth and economic growth is indicated by the World Bank report (2006) which estimates that a 10 percent decrease in homicide rates would have an outcome of 0.2 to 0.8 percent increase in per capita income.

Measuring crime and violence is a difficult endeavor. Although homicide has traditionally been the principal indicator used to measure and compare the incidence of violence in neighborhoods, cities, regions and countries, this tendency has met with criticism. The 2002 World Bank report emphasizes the fact that there are other forms of criminal acts just as violent as homicide, such as domestic violence and other forms of violent assaults, which do not always result in death, and the number of these continues to be underestimated (see Beato, 2001). In addition, although the sub-register of homicides tends to be less than other types of crime, problems of inconsistency among different information sources and deficiencies relating to the collection and organization, and the quality and reliability of homicide statistics still persist (Castro *et al.*, 2003; Beato, 2001).

Another complication that affects the use of homicide as an accurate indicator of violence is the variety of different meanings the term carries, which may blur significant relative differences, such as motivations for the crime, and the relationship between victim and perpetrator (Parker and Smith, 1979; Parker, 1989), as well as significant differences in modus operandi and the geographical, social, and situational context where the killings occur. This has a direct impact

not only on the identification of the nature, extension and evolution of this complex crime but also on the creation of more effective strategies and policies for control and prevention (Beato 2001; Battitucci, 1989). In order to clearly delineate the limits of violence measurements in Brazil, it is important to take into account the quality of the country's data sources as well as information related to homicide rates.

1.1. DATA SOURCES AND QUALITY OF INFORMATION RELATED TO HOMICIDES IN BRAZIL

In Brazil, the main sources of data production on homicides are the Mortality Information System (MIS) of the Unique Health System (SUS), Military Police Reports on crimes (BO), and the Civil or Judiciary Police database. It is important to bear in mind that as of 1998, after twenty years under authoritarian government, the Military Police and the Civil Police have been under the authority of the State Governor, as required by article 144 of the Brazilian Democratic Constitution, with each State having jurisdiction over its own Military Police and Civil Police corps. The responsibility of the Military Police is crime prevention and control, while that of the Civil Police is criminal and forensic investigation. The state police forces in Brazil are autonomous and independent of each other but have complementary constitutional responsibilities. Each of

these organizations collect, organize, store, and furnish information in its own way, with distinct and often divergent objectives.

The Military Police store data related to criminal activities they receive from the 190 emergency call system and from radio reports from police officers on patrol. Although the Civil Police are immediately notified of emergency calls, the Military Police are generally the first to arrive at the scene of the crime. The basic function of the Military Police is not only to guarantee the preservation of the crime scene until the arrival of the Civil Police, but also to collect preliminary information that will aid in identifying the victim as well as the locale, the time the crime was committed, the *modus operandi* and the motive of the offender. This information becomes part of the police report, which is the main source of the Military Police database.

One of the limitations of the Military Police database is that it does not include the number of victims in each case, but only the number of incidents registered by the 190 calls (Beato, 2001; Zaluar *et al.*, 1994; Peres, 2004). In addition, the database does not take into account deaths which occurred in or on the way to hospitals.

Another limitation is that the system used by the Military Police, which differs from that used by the Civil Police, results in problems in preparing a final account of the crimes that occurred. Thus, while a violent crime may be defined for the Military Police as an attempt at homicide or even as physical aggression, for example, the Civil Police, who operate under the dictate of the Brazilian Penal

Code, may classify the crime differently, as murder, manslaughter, theft (resulting in death) or bodily injury (resulting in death). As a result, the Military Police database has a smaller count of homicide cases compared to the cases contained in the Civil Police database (Beato *et al.*, 2001).

In addition, the Civil Police homicide database gathers information acquired from Police Inquiries (*Inquerito Policial*), administrative investigation procedures prior to penal action, which are overseen by a Deputy Commissioner, who is also an official in the judiciary police. The objective of the Police Inquiry is to register all the evidence gathered during police investigation and research legally and chronologically, in order to record the crime and identify the perpetrator (see article 144 of the Federal constitution; Article 4 of the Procedural Penal Code).

Part of the contents of the Police Inquiry is listed in the Civil Police homicide database, which contains information on the identity and address of the victim(s), modus operandi of the crime, including time and locale, and identification of any suspects. This database, in contrast to that of the Military Police, registers not only the number of homicide victims, but also the deaths that occurred on the way to, or in, the hospital, and is considered to be one of the most comprehensive accounting of victims.

However, despite the contradictory data-gathering strategies and procedures, and the resulting discrepancy in the total number of homicides registered by the Civil and Military Police respectively, both police forces have

identified common hotspots where homicides occur in the city of Belo Horizonte, in the state of Minas Gerais, as substantiated in a study by Beato *et al.*, 2001.

Along with the databases used by the police, there is a national database known as SIM/MIS (Mortality Information System), which was set up by the Ministry of Health in 1975 to register all deaths, whether related to external causes or not. The main purpose of this data base is to create a national epidemiological security system. All registers of homicide are prepared by medical professionals who use the International Classification of Disease, or ICD codes. One of the problems with SIM/MIS has been that its nomenclature is not compatible with that of the databases used by the police.

Another difference is the undercounting of deaths. SIM/MIS uses the victim's home address to register the homicide, and not the actual place of the homicide, in cases where it might have occurred in another city or region (Silveira, 2007; Beato *et al.*, 2001). Although SIM/MIS furnishes substantial information on homicide victims, the information it furnishes with respect to the location of the incident is imprecise, thus making geo-processing of homicide case data difficult. This problem also pertains to police databases. Despite the limitations regarding reliability of official data sources on homicides in Brazil, the police data systems nevertheless remain the most useful resources for understanding homicide and its temporal and geographical patterns.

1.2. PATTERNS OF HOMICIDES

In general, homicide patterns in Brazil do not differ from global homicide patterns. The majority of homicides occurs in public places and involves the use of firearms. Young males, aged 15-29, are commonly the main offenders as well as high-risk victims (Zaluar, 2004). Data obtained from the Mortality Information System of the Brazilian Health Ministry reveals that in the year 2000, 70% of homicides in the country were committed with firearms, and 89% of all murders involved victims between 15 and 49 years of age (Peres and Santos, 2005). In 2002, 51% of deaths among young males aged 15-24 were the result of homicide, as opposed to 20% who died of natural causes (Cerqueira *et al.*, 2007). Homicide rates for men tend to decline with age, but remain steady for women through all age groups. Additionally, the homicide rate for Afro-Brazilians is two-thirds higher than the rate for Caucasians, although a recent analysis focusing on Sao Paulo, Brazil's largest city, shows that when controlling for education levels is effected, homicide rates do not vary by race (World Bank Report, 2006).

Despite the fact that homicide hot spots in Brazil are largely located in poor communities such as favelas in major metropolitan areas, namely, Sao Paulo, Rio de Janeiro, Salvador, Belo Horizonte, Porto Alegre (Peres and Santos, 2005), information available is usually incomplete or erroneous, and there are few investigations about the exact place where the crime was

committed. Even so, some geo-referenced spatial analyses of homicides committed in favelas have been done, although, under ideal conditions, these demand meticulous examination of data by researchers and crime analysts. In large cities, these analyses have been extremely important in the formulation of homicide control and prevention policies.

Some recent studies (Zaluar, 2004; Alvito, 2001; Vargas, 2006) show that the problem of homicides in Brazil is strongly associated with the increase in transnational organized crime involving cocaine during the 1980s, which triggered many other criminal activities, such as armed robbery, theft, and turf battles among drug dealers, especially in the favelas.

1.3. FAVELAS AND VIOLENCE

In Brazilian favelas, which are among the most violent places in the world, the majority of young males who die prematurely are poor favela residents who are involved in criminal activity, and are known to the police. Their everyday activities and life styles are circumscribed by the environment in which they live. They spend part of their lives involved in the lucrative business of illegal drug trafficking, hanging out with local peer groups of drug dealers, and exposed to many temptations and conflicts leading to a spiral of inter-personal minor offenses, betrayals, dislikes, and hatreds that tend to result in homicide. Despite the cycle of violence of which they are part, these young male criminals do not

run away from the favela; they continue their everyday life, hanging out in the same streets, raising their families, and prematurely dying, probably by gunshot, near the places where they spent most of their time.

This has led to the public perception that violence is an intrinsic element in the nature of favelas. As a result, favelas are often discriminated against, and stigmatized as dangerous places to live, even though most favela dwellers are law-abiding citizens. In order to understand this ambiguous association between favelas and violence, it is important to bear in mind their origins and features, and the misconceptions surrounding them.

1.3.1. FAVELAS: ORIGIN AND MAIN FEATURES

Favelas are typical scenes in metropolitan areas in Brazil. They are irregular and complex residential urban spaces, formed from the informal and clandestine occupation of municipal and private lands by poor and low income workers, the great majority of whom are of African descent (Vargas, 2006; Goldstein, 2003; Sheriff, 2001; Zaluar and Alvito, 1999). Favelas are usually built on irregular terrain; for the most part, in precarious areas. Generally, they are comprised of shanties, wooden houses, and unfinished brick houses, and characterized by high population density, poverty, lack of infrastructure, and intense social life (Vargas, 2006; Zaluar and Alvito, 1999).

Originally, favelas arose from the rapid growth of cities and industries at the beginning of the 20th century. This growth resulted in social exclusion and segregation of thousands of low-income workers and poor migrants. Many poor workers, and their families, incapable of paying the high costs of living in the cities, began taking over municipal land, especially on the periphery of cities, or near highways and other roads connected to the cities. Desperate settlers also set up makeshift housing close to shopping malls, and in centrally located areas of middle class or affluent neighborhoods. In this way, favelas were created quickly, appearing in urban areas without any infrastructural support from the government, such as public lighting, sanitation, running water, sewer systems, paved streets, public transportation, or essential public services such as health and social services or local police. As a result, favelas are often thought of as “fragmented cities” (Silva, 2005).

For the most part, favelas are interconnected by a network of alleys and pedestrian streets that cut across each other, thus forming micro areas. Generally, they are poorly illuminated, surrounded by unfinished brick houses, built side by side, with no natural means of ventilation between them, and no street signs or address markers. In such an intricate panorama, numerous paths with multiple exit and entrance options are created, harboring secret spaces for lawbreakers to engage in illicit activities, and to hide from the police. These labyrinthine alleys confuse and hinder outsiders unfamiliar with their unique idiosyncrasies.

Despite the bleak social conditions, some favelas are bustling communities whose dynamic social life is intense, characterized by active local commerce, shops, small businesses, bars, and flea markets.

In addition, social life in various favelas is marked by diverse churches, a few public schools, and a variety of local art and culture groups, as well as neighborhood organizations that try to improve the quality of life for residents. Furthermore, favelas have been formed by generations of families who raised their members there and who generally live at the same address or in the same general locale. As a result, a favela is characterized by various micro-social environments of family members, friends, and acquaintances (Alvito, 1996; 2001).

The Brazilian government has made many efforts in recent years to integrate the favelas into the cities in which they are located. Public authorities at national, state and municipal levels have invested resources in the infrastructure of the favelas in order to improve the quality of life of their inhabitants (Brazilian Ministry of Justice, 2002). Despite these efforts, however, favelas largely remain urbanized micro-spaces, usually located within city limits, or at the periphery of big cities. Some parts of favelas are well organized, with a functioning infrastructure, while others have limited or no infrastructure.

1.3.2. MISCONCEPTION REGARDING FAVELAS AS HOTBEDS OF CRIME

In the Brazilian popular imagination, the word “favela” is associated with “disorder,” a nucleus of diseases and epidemics, lack of hygiene, and a “dangerous local class” comprised of thieves, streetwise persons, and a promiscuous and immoral population. This representation of favelas not only creates a poor image of their impoverished residents, it also influences many public perceptions of favelas as hotbeds of crime.

First, favelas are perceived as unlawful places where crime goes unpunished, in contrast to more orderly metropolitan areas (Misse, 1995). As a result, young and poor men are regularly subjected to intense surveillance and repressive police actions which have resulted in police brutality and incidents of misconduct (Zaluar, 1984; 2004).

Historically, the relationship between the police and favela inhabitants has been characterized by tension and conflict. Traditionally, repressive military police operations have routinely conducted crackdowns and sweeps in the favelas to control crime, and contain “dangerous residents,” rather than trying to install preventive community-policing initiatives to guarantee social order and quality of life in the community (Souza, 1999). To make matters worse, police authorities have shown very little interest in investigating and solving serious crimes in poor areas, as shown by Zaluar (1984; 2004). Consequently, the

inhabitants of these areas live out of sight of the law, thus increasing their impunity, as well as their susceptibility to the rules of the favela itself.

Second, poverty, itself identified as a core structural component of the favelas, is commonly perceived to be *per se* the main cause of violence and crime (Misse, 1995). This public perception has contributed to the criminalization of poor and marginalized favela residents, even though empirical studies have shown that the number of poor young males involved in criminal activity corresponds to a small proportion of favela inhabitants (Zaluar and Alvito, 1998; Zaluar, 2004).

Empirical studies have shown, moreover, that despite the perceptions that poverty and public disorder are the main causal factors of favela violence, in actual fact, the concentration of homicides is related to the expansion of international cocaine trafficking in the 1980s which has negatively impacted social life in favelas (Zaluar, 1984; 2004; Beato *et al.*, 2001; Alvito, 2001; Nascimento, 2005).

1.3.3. THE INCREASE OF DRUG TRAFFICKING AND VIOLENCE IN BRAZILIAN FAVELAS

Drug trafficking is not equally distributed in all the impoverished areas in Brazil; rather, it varies according to social context, and organization of local

criminal groups and their involvement in global networks of illegal drug and weapon trafficking. A combination of intrinsic elements of the nature of favelas has been highlighted in order to explain the explosion of drug trafficking in such areas (Zaluar, 2004; Manso, 2005; Soares *et al.*, 2005).

With its high proportion of impoverished young men, favelas provide a sizable, cheap, and replaceable mass of young recruits for the drug trade, providing them a lucrative opportunity to make easy money (Zaluar, 2004). At the same time, favelas offer a strategic environment for drug commerce to flourish (Soares *et al.*, 2005; Vargas, 2006). In general, favelas are close to highways, allowing easy access to consumers from outside the favela. In addition, they usually consist of a maze of narrow and crooked alleys and pedestrian paths. This environment of isolated spaces is perfectly suited for illicit activities, protecting offenders against their enemies, and rendering police surveillance difficult (Vargas, 2006). Further, the state's failure to provide social protection and public security to favela inhabitants is highlighted as an important factor which contributes to turning favelas into a no-man's-land and an ideal location for criminal activity.

Favelas have since become central nodes in the transnational web of the drug trade, which is controlled by dealers who occupy high and strategic positions in the broad web of organized crime. At the local level, young armed drug lords challenge state and public authorities, expanding and protecting their criminal activities (see Alvito, 2001; Zaluar, 2004; Vargas, 2006). As a result,

illegal drug trafficking invades public spaces and becomes a visible activity in the daily life in favelas.

1.3.4. THE IMPACT OF THE DRUG TRADE ON SOCIAL LIFE IN THE FAVELAS

The new dynamic of drug trafficking, which began in the 1980s, has also had a substantial impact on social life in the favelas, shaping an ambiguous relationship between armed drug dealers and favela residents. In addition, pioneering ethnographic studies on violence in favelas demonstrate the link between the explosion of drug trafficking and the cycle of violence among adults and adolescents involved in criminal gangs (Soares *et al.*, 2005; Barcellos, 2005; Athayde and Bill, 2006; Feffermann, 2006).

On one hand, young drug lords and their recruits, are born and live in the favelas. They are friends, family members, and acquaintances of other inhabitants. Many have established social bonds in their communities, by lending money, supporting families, and providing other forms of assistance. These “drug lords” frequently rely on illicit activities by influencing political actions of neighborhood associations, supporting political candidates for public elections, and financing social activities, such as local sporting events for youth, and community festivities. They also provide armed protection for local commerce,

thus helping the local economy to thrive (Zaluar and Alvito, 1998; Alvito, 2001; Zaluar, 2004).

On the other hand, through the use of threats, violence and harassment, drug dealers and their criminal groups strengthen their local rule, and drive out community residents who try to interfere with their criminal activities. In this way, a “peaceful” familiarity is established between favela inhabitants and drug dealers, based on an implicit code of silence. Residents maintain silence despite their knowledge of the fact that drug dealers are enhancing their control over the favela by means of the criminal ties that they establish with political leaders and corrupt police agents (Vargas, 2006; Goldstein, 2003; Zaluar 1994).

In the 1980s, a new drug trafficking dynamic began in the favelas, characterized by oft-repeated cycles of violence. These deadly cycles were marked by systematic battles between drug dealing groups for the control of drug markets, disputes over drug debts, and trivial acts of revenge. There were also frequent intense clashes between police and drug dealers. This chain of violence, which continues to be associated with the presence of drug trafficking gangs or groups in major urban centers of Brazil, has generated opportunities for young males to kill or be killed. It has also increased fear in poor communities, and has reinforced the collective belief that favelas are, by their nature, violent places, and their inhabitants a “dangerous class.”

1.4. PUBLIC POLICIES REGARDING VIOLENCE

In Brazil, for the most part, crime policy has essentially focused on two main factors: reducing the “root” causes of crime and implementing criminal justice reforms. As a result, a spectrum of complementary responses has been implemented, as shown by World Bank Report no. 36525. Crime prevention programs in poor neighborhoods have been launched at all levels— individual, family and community – with public authorities supporting the implementation of youth-oriented social development programs which include a variety of social, cultural, sports and educational initiatives in partnership with non-governmental organizations and members of the community itself. These programs have also focused on empowering communities persistently identified as hot spots of violence, through the rebuilding of social capital, trust, and cohesion in formal and informal social institutions (World Bank Report, 2006), thus reducing insecurity as proposed by the National Public Security and Citizen Program – PRONASCI, 2007.

Crime reduction policies have also included more repressive criminal justice responses, focused on the incarceration of repeat offenders, increasing police responses in geographical and temporal hot spots of crime, as well as preventive measures through community policing initiatives. These initiatives seek not only to increase the presence of police and the public’s trust in them, but also to reduce the fear of crime in such areas. Furthermore, criminal justice

reforms have included investments in educational and professional training for criminal justice practitioners, and strengthened partnerships between community, nongovernmental organizations, research institutes and universities (World Bank Report, 2006).

Thanks to extensive investments and combined national, state, and municipal government efforts to promote more efficient and innovative responses to crime and violence, some states have succeeded in lowering their homicide rate. Part of this success can be attributed to innovations in providing effective police response, through the integration of technological tools and information systems, and the help of modern management systems using crime mapping software, as well as spatial data analysis focusing on geographical hot spots of crime. This change in ways of organizing and analyzing crime data has had positive effects on crime reduction. A good example is Sao Paulo, where homicide rates have dropped from 35.7 per 100,000 residents in 1999 to 15 per 100,000 people in 2005 and 2006, according to data furnished by the Brazilian Ministry of Justice (SENASP: 2005, 2006).

In addition, another successful crime prevention response is “FICA VIVO” (Stay Alive), an innovative program aimed at preventing and controlling homicides in the state of Minas Gerais. This program was first implemented in favelas in Belo Horizonte, the state’s capital in 2002 (Beato, 2003). Inspired by the success of Boston’s Operation Cease Fire (Kennedy *et al.*, 2001; Braga, 2003), this program has now expanded to favelas in other cities in the state

where homicides are a chronic problem. FICA VIVO encourages proactive measures to prevent homicides among 12 to 24 year-olds, and also seeks to involve community members in the prevention process wherever it is implemented. The program also involves strategic intervention in hot spot areas, bringing together prosecutors, judges, and federal and state police forces, including the GEPAR (a police unit that works in high-risk areas for violence), with the objective of monitoring gang activity and sending repeat offenders to prison.

Another pioneering program aimed at controlling violent crime in Brazil is called IGESP, a new public safety integrated management policy launched in the state of Minas Gerais. It has been in operation in Belo Horizonte since 2005 (Beato *et al.*, 2007). IGESP, inspired by NYPD's COMPSTAT (Computerized Statistics Crime Monitoring system), uses a geographical information system and a problem-solving methodology as crime analysis tools. With the support of other criminal justice agencies and various other partners, it promotes integrated activity among the different police forces, prioritizing interventions in hot spots, and the apprehension of potential offenders.

The literature has shown that the strategy of having law enforcement entities focus on hot spots and repeat offenders has been more effective than relying on traditional measures such as imprisonment and random repressive patrolling (Braga, 2005). Many problem-oriented policing experiments, such as Boston's Operation Ceasefire (Braga *et al.*, 2001), the Boston Gun Project's

Operation Ceasefire (Kennedy *et al*, 2001) and other programs such as The Great Newark Safer Cities Initiative, GNSCI, (GNSCI Report, 2001) have demonstrated the effectiveness that proactive measures can have when potential partners collaborate in specifically targeted, high-crime areas. Generally, the greatest advantage of these innovations is that they dissuade repeat offenders from violent behavior, and encourage criminal justice agencies, the community and other partners to work together. However, despite the numerous efforts to control and prevent violence, homicide prevention measures in Brazil have not considered the effects that environmental and situational factors might have in making the crime of homicide, often considered irrational, easier to commit and get away with.

OVERVIEW

Chapter 1 of this study discusses homicide patterns, the cost of violence, and crime prevention policies in Brazil. In addition, it describes and analyzes the nature of favelas, their main characteristics, and factors that have contributed to the misconceptions of favelas as dangerous places. The main goal is to demonstrate how researchers and academics have explained the concentration of homicides in such poor areas, and how they have addressed one of the main beliefs that plagues the public, politicians and some social and political scientists as well: the growth of favelas as a necessary condition for increased violence in Brazil.

2**HOMICIDES IN BELO HORIZONTE**

Belo Horizonte, the third largest Brazilian city and the capital of the State of Minas Gerais, is located in the Southeastern region of the country, surrounded by mountains. It occupies an area of 335 square kilometers, with 2,238.526 inhabitants, and 628,447 households (The 2006 Atlas of Human Development of the Metropolitan Region of Belo Horizonte.) According to the 2000 census, there were 6,765 inhabitants per square kilometer. Ninety-five percent of Belo Horizonte's total area is concentrated in 37 neighborhoods, while the remaining five percent is comprised of 179 favelas and 48 public housing projects occupied by about 500,000 residents, most of whom are poor (Beato, 2003).

The economy of Belo Horizonte is based largely on the service sector, which is responsible for eighty-five percent of the city's Gross Domestic Product, while its industrial sector is responsible for the remaining fifteen percent.

The city's Human Development Index (HDI) is high: 0.839% for the decade between 1991 and 2000, according to the 2006 Atlas of Human Development of the Metropolitan Region of Belo Horizonte (Joao Pinheiro Foundation, 2006). However, the Atlas does not accurately reflect the social disparity among the city's population. This disparity becomes clear only when the HDI of favelas and public housing are compared with the HDI of other neighborhoods.

Favelas and public housing have the lowest HDI in the city. Four of 179 favelas and public housing complexes have an HDI of 0.685, equal to that of Bolívia, a country whose HDI is considered the lowest on the South American continent. Another nine favelas and public housing complexes have an HDI of 0.688.

In stark contrast, Belo Horizonte's more established neighborhoods have the highest HDI in Brazil. Eighteen out of 37 neighborhoods have an HDI of 0.919, and the HDI of thirteen of these eighteen is 0.942, which is higher than that of Norway, the country with the highest HDI in the world. The 2006 Atlas of Human Development of the Metropolitan Region of Belo Horizonte shows that the gap between the city's poorest and richest inhabitants increased between 1991 and 2000. As a result, the gap in average income between the most affluent 10% and the poorest 40% of the metropolitan population increased 2½ %, over the 1990s, from just under 25% in 1991 to 27¼ % over the course of the decade. In addition, the population of Belo Horizonte has experienced a sharp rise in violence, a problem that has similarly threatened public safety and the quality of life in many other large Brazilian cities.

2.1. THE GROWTH OF CRIME IN BELO HORIZONTE

Studies conducted by Silva (2004, 2005) on the evolution of violent crime in Belo Horizonte show that the number of violent crimes in the city escalated

from 26,769 reported occurrences in 1994 to 43,723 reported crimes in 2004 (Silva, 2004, 2005). Homicide rates increased more than 60% in a period of ten years, from 1990 to 1999, rising from 13.73 homicides to more than 22.86 homicides per 100,000 inhabitants. In addition, Silva (Silva, 2004, 2005) shows that the increase in homicides has become particularly remarkable since 1997, as homicides grew from 468 reported occurrences in 1997, to 797 in the year 2000.

The increase in homicides in 2000 has since been widely reported by the Brazilian media, and has become a core concern of the government, the police, and criminal justice experts and policy makers. However, despite the attention the rising homicide rate has attracted, and the urgent solutions it has called for, efforts to control and prevent violent crime in Belo Horizonte failed to slow the alarming rise in homicides, which peaked at 1,380 homicides reported in 2004 (Silva, 2005).

As the growth in homicides has become an increasingly urgent issue in Belo Horizonte, a series of scientific studies have been undertaken to explore effective crime mapping tools and spatial analysis techniques that can identify, describe, and examine the nature of homicide and its temporal and geographical patterns (Beato, 2000; Beato *et al.*, 2001; Beato, 2003; Silva, 2004, 2005). These studies have laid the foundation for advances in understanding crime patterns in the city. They have helped guide innovative and effective crime prevention and

control policies, and have built a bridge between criminal justice practitioners, policy makers, and academics.

2.2. HOMICIDE AND ITS PATTERNS IN BELO HORIZONTE

A study conducted by Beato *et al.*, (2001) demonstrates that homicides are not homogeneously distributed in Belo Horizonte, rather they are concentrated in six of eighty-one urban clusters that encompass favelas, namely (1) Alto Vera Cruz, (2) Barragem Santa Lucia, (3) Morro das Pedras, (4) Taquaril, (5) Serra, and (6) Pedreira Prado Lopes. Homicides share a unique geographical and temporal dynamic: they occur more often in public places such as streets, alleys, drug markets, and bars. Homicides occur most frequently during weekends, and for the most part late at night, between 8 p.m. and well after midnight. These patterns may be explained by the lack of informal social control at such times and places, as suggested by the Routine Activity Theory (Cohen and Felson, 1979). Also, they may be related to the shared life styles and social characteristics of offenders and their victims, as described in the section below.

2.2.1. OFFENDERS AND VICTIMS

Murderers and their victims share similar characteristics: the majority of them are young black males, 18 to 24 years of age, single, either of low

occupational status or unemployed when the killing occurred (Paixao, 1995; Beato *et al.*, 2001; Silva, 2005). In homicides related to drug trafficking, the majority of offenders and their victims were involved in drug trafficking as “consumers” or “members” of illegal drug markets (Beato *et al.*, 2001; Silva, 2004; Nascimento, 2005).

An analysis of the trajectory of crime in violent favelas shows that offenders and their victims are likely to have grown up in the same neighborhood and to know one another. This finding shows that offenders and their victims traveled a very short path to meet each other at the location of the crime. The average distance between offenders and victims’ homes and the homicide location is less than 350 meters, as shown by BEATO *et al.*, (2001). Furthermore, according to a 2000 Victimization Survey (CRISP, [crisp.ufmg.](http://crisp.ufmg.br)), about a third of the population in Belo Horizonte's violent favelas was an acquaintance or a family member of a homicide victim.

2.2.2. MOTIVATIONS FOR KILLING AND THE INCREASE OF DRUG MARKETS IN BELO HORIZONTE’S FAVELAS

According to BEATO *et al.*, (2001), the concentration of violence in favelas is related to an increase in drug trafficking, and the access to firearms among youth that has accompanied that increase since the 1980s. Homicide data collected by the Homicide Crime Division of the Civil Police in the State of Minas

Gerais in 1999 registered a total of 377 reported homicides. 49% of these killings were related to drug trafficking, 27% were revenge killings, 7% were crimes of passion, and 7% were related to alcohol abuse (Silva, 2004).

Studies of violence in Belo Horizonte (Beato *et al.*, 2001; Silva, 2004; Nascimento, 2004; Silveira, 2007) show that homicides related to drug trafficking were often caused by drug debts between the drug dealers themselves, their clients and their drug pushers. Other causes were battles between rival drug dealers competing for territory, and assorted instances of disloyalty, betrayal, and retaliation among young adult males and adolescents involved in the drug-selling network (Beato *et al.*, 2001; Silva, 2004; Nascimento, 2004; Silveira, 2007).

Homicides are also explained by the young adult males' and adolescents' increasingly easy access to firearms when protecting their drug turf. The Victimization Survey conducted in Belo Horizonte in 2000, found there are approximately 170,000 firearms in Belo Horizonte. 7.5% of these gun owners are located in less violent areas of the city. In favelas, less than 3% of the population was found to possess one or more firearms. Paradoxically, however, firearm owners in favelas carried their weapons 38% more frequently than gun owners in the rest of the city. It is reasonable to assume favela residents who possess firearms have more opportunities to use them, as opposed to gun owners in other parts of the city.

Furthermore, the expansion of drug markets in favelas in Belo Horizonte might be explained by ecological factors which render them uniquely suited for

obtaining crack, cocaine, and marijuana and distributing them to the rest of the city. These factors are:

(1) Most favelas are located in strategic areas, usually connected to an urban center, and surrounded by urbanized neighborhoods. Easy access, via main thoroughfares, facilitates trafficking between local drug dealers and outside drug buyers.

(2) The complex network of alleys, also characteristic of favelas, is a result of the informal process of land occupation. Alleys create conditions for more clandestine drug trafficking inside favelas, which makes informal surveillance and police control difficult. Alleys also present inviting routes for lawbreakers to escape into and hide from the police.

(3) The irregular topography of favelas, with their hills and troughs, allows residents, particularly drug dealers, to monitor anyone coming and going to and from the favela, especially police.

(4) The large numbers of young people who live in favelas create a profitable environment for the selling of illegal drugs. . The creation of small drug markets on street corners has attracted young men towards this informal occupational opportunity, by offering them easy money,

status among their peers, the company of girls, and excitement (Zaluar, 2004; Nascimento, 2005).

Research findings have concluded that the probability of someone being killed in Belo Horizonte depends on the social and demographic characteristics and the life styles of offenders and their victims, as well as on the characteristics of the community one is from. Structural factors involving the community have been discussed by social disorganization theorists, and by social scientists in Belo Horizonte, who consider them an important factor in explaining homicides in favelas (Beato, 2003; Silva, 2004; 2005).

2.2.3. HOMICIDES AND FEATURES OF VIOLENT FAVELAS

Based on the Municipal Health Office data and the 2000 Census, a study by Beato *et al.*, 2001, shows that favelas in Belo Horizonte with a high concentration of homicides also have high rates of health problems as well as the lowest socio-economic indexes in the city. This study contends that looking at general trends in favelas does not adequately explain why homicides have increased so dramatically. The explosion of homicide rates in favelas is a result of a complex combination of structural factors in the communities, which are specific to the environment of favelas, such as: poverty, physical and social disorder, weak mechanisms of formal and informal social control, and the

expansion of drug trafficking. In order to explain how such factors affect homicide rates in favelas, researchers have tested social disorganization theory and its advances.

2.3. RESEARCH FINDINGS ON HOMICIDES IN BELO HORIZONTE

Major studies of homicide in urban spaces in Belo Horizonte examine aggregate data using favelas and neighborhoods as the main units of analysis (Beato *et al.*, 2001; Beato, 2003). Research findings have shown that clusters of homicides in favelas can be explained by a conjunction of various structural characteristics, such as a high level of social vulnerability, poverty, physical and social disorder, the invasion of drugs, and the spreading of groups of young men involved in drug selling activities in public places. All the environmental aspects of violent favelas have been associated with the government's failure to provide resources and public services in such areas. Institutional and community forces for social control have proved ineffectual in addressing and solving community problems (Silva, 2004; Nascimento, 2005).

In order to explain how structural factors of favelas in Belo Horizonte may influence the high homicide rates, researchers have tested social organization theories on community and crime articulated by Shaw and McKay (1942), researchers at the Chicago School of Human Ecology (Silva, 2004; Nascimento, 2005). They have also tested advanced concepts of social disorganization

theories, such as collective efficacy, which was developed by Sampson and his colleagues (Sampson and Groves, 1989; Sampson *et al.*, 1997).

Inspired by these concepts, an important study (Silva, 2004) based on a victimization survey conducted in Belo Horizonte in 2002 by the Center of Studies in Crime and Public Security (CRISP/UFGM) creates an analytical model using social cohesion indicators to measure collective efficacy as well as indicators of social and physical perceptions of disorder, to explain clusters of homicides within violent favelas. This study shows that despite the extreme poverty and the perceived disorder, favelas are very cohesive social entities. This finding supports the results of other studies of favelas which demonstrate that communities in favelas have strong social bonds, made up of friendships and family ties within neighborhoods (Alvito, 2001; Zaluar and Alvito, 1998).

In addition, lower rates of residential mobility are evident in favelas. Inhabitants raise their families there, and most of their descendants tend to reside in the same area. Relatives build their houses on the same lots, and there is a strong chance that their descendants will reside and raise their families in the same place as well. This continuous process of residential stability results in the development of strong ties among residents, their relatives and neighbors. As a result, the residential stability of residents of favelas is associated with its high rates of social cohesion, as shown by Silva, 2004.

But although social cohesion in favelas are strong, it has not helped the community to reduce delinquent behavior or crime in public areas, something

which Sampson's Collective Efficacy approach suggests should happen. According to Sampson *et al.*, (1997), social cohesion increases the sense of collective cooperation within certain neighborhoods in Chicago, and strengthens residents' ability to take action maintaining public order and achieving the common goal of creating safer public spaces. As a result, in the Chicago example, there are reductions in opportunities for social and physical disorder in public spaces (Sampson and Groves, 1989; Sampson and Raudesnbush, 1999) – a result that differs from the research findings in Belo Horizonte's favelas (Silva, 2004).

Silva, 2004, also reveals that in violence-ridden favelas, high homicide rates are linked to perceived social and physical disorder, high poverty rates, and the expansion of drug-selling gangs in public spaces. Such factors are more strongly associated with homicides than with social cohesion.

Poverty and hardship in hot spot favelas affect the ability of residents to demand public resources for the community, despite the high level of social cohesion (Silva, 2004). This influences residents' ability to control social and physical disorder and the behavior of adolescents in public areas. Studies (Nascimento, 2005; Zaluar and Alvito, 2004) have also shown that the growth of drug markets and the systematic cycle of violence among teenagers and young adults involved in drug-selling networks have frightened community members, thus preventing them from addressing such problems.

An ambiguous social relationship between drug dealers and favela residents seems to play an important role in decreasing community control over crime and delinquency as shown by Alvito (2001), Zaluar (1984, 2004) and Nascimento (2005). On one hand, drug dealers grant assistance to community members not only by lending money, providing medicine, paying for funerals, and supporting local sports activities, but also by protecting their communities from thieves and robbers. On the other hand, however, they threaten community members, who are too frightened to report criminal activities to the police. This ambiguous relationship between criminals and law-abiding residents might therefore be explained by the social bonds between them.

2.3.1. CONTRIBUTION AND LIMITATIONS OF STUDIES ON VIOLENCE

Studies on violence in favelas in Belo Horizonte have helped researchers identify homicide clusters, and the temporal and geographical distribution of violence and its patterns (Beato *et al.*, 2001; Beato, 2003; Silva, 2004; Silva, 2005). These studies have had an important effect on the implementation of more effective policies for controlling and preventing homicides.

Government and nonprofit agencies have responded to high crime rates in Belo Horizonte by empowering residents to take control of their communities, as shown by the successful homicide prevention project, FICA VIVO (Stay Alive).

Through these programs, neighborhood organizations and other agencies in partnership with local official authorities have collaborated to reduce delinquent behavior and improve conditions in poor neighborhoods, by strengthening informal social control mechanisms, and enabling residents to demand resources and public services (Beato, 2003). Technological crime analysis tools, strategic interventions and an integrated management system have helped police contribute to crime reduction in Belo Horizonte as well, as previously discussed in Chapter I of this study.

However, no empirical research has focused on investigating in detail the role that situational factors and characteristics of crime settings play on the distribution of homicides within favelas. Environmental criminologists (Felson, 2006; Clarke, 1997; Brantingham and Brantingham, 1991) interested in the relationship between places and crime events have shown the importance of situational factors, environmental cues, and opportunities on the individual criminal decision-making process, and on clusters of crime in specific locales, while other areas remain free of crime.

Environmental criminology has shown how a careful examination of the characteristics of places at the micro level can help identify and analyze how and why situational factors create opportunities for motivated offenders to commit homicides. This helps officials and other agencies focus their crime prevention interventions on the immediate causal factors that lead to the alarming homicide rates. Consequently, the focus on environmental factors expands crime

prevention strategies that have traditionally aimed at reducing crime in the long run, and from the top down, by empowering community residents to solve problems locally, and by forcing institutions to adapt, and by forcing people to respond more consciously to social problems.

Furthermore, careful analysis of places where crimes are commonly committed contributes to improved policing strategies, rendering them more analytical and geared toward problem solving. The added focus on intervention to address situational factors and opportunities for crime also helps complement efforts to target hot spots and put chronic offenders in prison.

OVERVIEW

Chapter 2 of this study describes the main socio-demographic and economic features of Belo Horizonte. It analyzes one of the core problems of the city, namely, the evolution and concentration of homicides in six favelas, considered hot spots for violence, one of which is the Alto Vera Cruz favela. The study also shows that the concentration of homicides in such areas is the result of a combination of many factors, such as poverty, physical and social disorder, weak informal and formal mechanisms of social control, explosive growth of drug trafficking, easy availability of guns, and the government's failure to provide health and other public services to the favela's population. The principal objective of Chapter 2 is to analyze the problem of homicides in favela hot spots, thereby

providing a background to help understand the killings of countless impoverished adolescents and young males in public spaces of the Alto Vera Cruz favela.

3

THE STORY OF VIOLENCE IN THE ALTO VERA CRUZ FAVELA

Chapter 3 of this study begins with a brief description of how and why the Alto Vera Cruz favela was chosen as the place to explore the relevance of situational opportunities for homicides. Next, it describes the favela, presenting a temporal and geographical analysis of homicide patterns inside its area. In addition, it relates the reality of violence in the AVC favela through narrative accounts provided by criminals who operate within and the police who patrol there. These narratives are part of a preliminary attempt to explore the nature and dimension of the homicide problem, and to show how this research project took shape based on the stories of those who live and work in the favela. .

Between September 2005 and December 2007, before the research design of this project was completed, police officers and incarcerated repeat murderers from the AVC favela were contacted. The ensuing records were based on informal conversations between these individuals and the researcher; therefore they lacked the standards of qualitative data and are not used for analysis in this study.

To approach the police, authorization was obtained from both Military and Civil Police officials. Permission was obtained to speak with officers and investigators, and to examine the official databases. Information was then

gathered from beat officers from the Military Police's Precinct and detectives and databases from the State of Minas Gerais' Civil Police Homicide division.

The main goal was to obtain officers' and detectives' personal opinions as to how the geography of the favela, including both its physical and social aspects, can influence not only crime prevention and control, but also criminal investigations. The interaction with the Military Police allowed the researcher to join them on their regular foot patrol of the favela, and to observe both the crime sites and the policing difficulties that result. The researcher accompanied the police on three separate occasions; once on a Monday, and twice on Tuesdays, between 10:00 PM and 1:30 AM, when there was less drug trafficking activity and consequently, less risk of a confrontation, which could threaten her safety. Also, accompanying police during night operations rather than during the day prevented favela inhabitants from seeing the researcher with the police, thus preserving research neutrality and allowing for future contact between the researcher and young suspects and murderers. This time period also allowed the researcher to view the area during the hours when homicides most commonly occur, according to official data.

Additional information on homicides was obtained from informal conversations with the Commander of the Military Police Precinct and police officers from two different police teams: six from the *GEPAR*, a military police unit that specializes in policing homicide hot spot favelas and four from the *Tatico Movei*, a sort of SWAT team with a more reactive mandate. This information was

complemented by informal conversation with seven detectives and five commissioners from the Minas Gerais Civil Police.

In addition, preliminary exploratory research activities included accompanying two undercover military police officers patrolling the favela's main drug sale spots during the day time. The information obtained was critical for the identification of these places, as well as for later analysis of the link between drug sale spots and homicides.

With regard to meetings with criminals, the researcher, with the help of the commander of the Military Police Precinct, contacted the director of the *FICA VIVO*, a violence prevention program (discussed in Chapter 2 of this study) in the Alto Vera Cruz favela. This facilitated learning about the program, and especially its strategies for dealing with young criminals. At the same time, the young people of the Program who work with adults and teenagers from the favela also facilitated contact between the researcher and young males involved in murders. One of these workers ended up assisting the researcher in approaching 8 young murderers who had been incarcerated many times over the years, and whose experiences and opinions proved invaluable for this research.

This young male worker arranged three meetings with young males suspected of being involved in murders. In the first meeting, the researcher met the leader of a gang whose turf covers the upper part of the favela. In order to guarantee a tranquil environment while speaking with him, without potential threats from members of rival gangs, a meeting place was set outside the favela.

The researcher met him in a park in the downtown area of Belo Horizonte. In the second meeting, the researcher met another drug gang lord. The meeting with this young male took place in front of his house in a small alleyway within the favela, while four gang members watched for any possible threats from the rooftops of the surrounding houses. In the third meeting, the researcher met five adolescent males who were active members of drug gangs. The setting was a public school in the favela, where they were participating in a social activity arranged by the *FICA VIVO* Program.

Five accused murderers, also involved in drug trafficking according to the police, were also contacted. Conversations with these criminals helped to reconstruct and understand the story of violence in the favela from the perspective of its main players. Three of these accused murderers were contacted in prison. These three were incarcerated in maximum security prisons. In order to speak with them, the researcher obtained authorization from the Secretary of Public Security in the State of Minas Gerais. The meeting with the other two gang members/murder suspects took place in the Homicide Division of the Civil Police that was handling their cases.

Despite the fact that this information may be limited, and biased on account of the memories and subjectivity of criminals and police involved in homicide cases, the objective of approaching these individuals was to get preliminary information on how these persons perceive the environment of the favela, and the reasons it appears such a favorable setting for crime. As a result,

these contacts provided not only empirical support to the formulation of the hypotheses that guide this research project but also valuable insights that helped the researcher produce a video-clip focusing on homicides and environmental factors in the AVC favela.

In sum, the information presented in this chapter helped the researcher to create an environmental survey protocol for primary data collection that will be further discussed in Chapter 5 of this study.

3.1. THE MAIN REASON TO USE THE AVC FAVELA AS THE RESEARCH SITE OF THIS STUDY

The availability of a useful and well organized police data system for tracking homicides is crucial in order to use the Alto Vera Cruz favela – one of the six hot spots of homicides in the city of Belo Horizonte, as the research site of this study. This data system, known as the SIAC (Integrated System of Criminal Monitoring), is organized by the Military Police Precinct which is responsible for crime prevention and control in the AVC favela.

The SIAC, which was launched in 2004, is updated daily with systematic information on homicides and other related problems such as gangs (gang turfs, members, criminal records, networks, and organization), drug spot locations, shootings, and arrests. It represents the first attempt to systematically organize, integrate and monitor information on homicide and active gangs involved in the

drug trade at the local level. This information is not merely a compilation of official statistics; it is a complex and varied data source, augmented by the practical knowledge of police officers in Belo Horizonte. The SIAC has become the main reference on how to organize crime data on gangs and violence for the Military police department in the State of Minas Gerais.

The information provided by the SIAC is used in this study as a complementary data source, providing comprehensive information on the dynamics of homicides and related criminal activities in the Alto Vera Cruz favela. It offers a variety of information not usually found in police homicide statistics.

3.2. FEATURES OF THE ALTO VERA CRUZ FAVELA

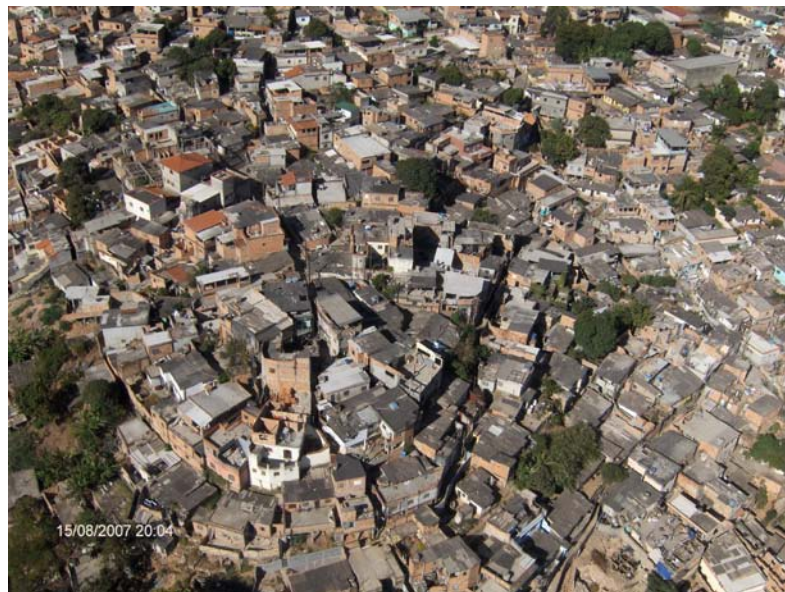


Photo 1: The Alto Vera Cruz Favela

The Alto Vera Cruz (AVC) favela emerged in the same way as all favelas in large Brazilian cities. It is the result of the struggle of the economically needy section of the population to find a home. The favela is a social process that began in the 1920s. AVC started as an urban residential settlement on municipally-owned land illegally appropriated by poor Brazilians in Belo Horizonte. The densely populated settlement was occupied in a disorganized manner, without basic infrastructure, and its inhabitants received no social services from the city of Belo Horizonte. Its consolidation intensified in the 1950s as a result of its residents' unending battle to integrate the favela into the Belo Horizonte municipality, thus guaranteeing better living standards for its population (URBEL, 1999).

The AVC favela is situated in the eastern part of Belo Horizonte, on irregular terrain with steep inclines. According to the 2006 Atlas of Human Development for the Metropolitan Region of Belo Horizonte (Joao Pinheiro Foundation, 2006), the AVC favela occupies an area of 0.83 square kilometers and has an estimated population of 21,499 inhabitants.

Like most favelas, Alto Vera Cruz is linked to the city center by a bustling highway. Andradas Avenue, which surrounds the northern part of the favela, is the main artery for commercial activities and services, and connects AVC with the city. In the southwest, the Alto Vera Cruz favela is surrounded by Jequitinhonha Avenue and borders a neighborhood called Vera Cruz; and in the southeast it is bordered by the Santa Terezinha canal, which separates the

favela from the Granja de Freitas housing project. This uncovered canal is effectively an open-air sewer, a foul-smelling, rat-infested garbage dump which has greatly contributed to the diminishing of the quality of life of those who live around it.

The integration of the Alto Vera Cruz favela into the city's urban structure began in the 1980s, as the result of a municipal law that was passed. This legislation created PROFAVELA, a housing program established to regulate and urbanize favelas in Belo Horizonte. Under the auspices of this program, the AVC benefited from the creation of a street system, the approval of a land division project, and legislation regarding land use and parcel legalization, thus guaranteeing property titles for some of its residents. Since it began operating, PROFAVELA has provided public health centers, schools, culture and community programs, public lighting, and a garbage collecting system (PROFAVELA, 1984).

However, the urbanization of the Alto Vera Cruz favela has not been a smooth process. It came about in disorderly fashion, resulting in an intricate urban landscape that inadvertently mixes components of thoughtful urban progress with components of extreme social marginalization, blending safe and dangerous building construction sites, as concluded in a study by the Division of Urban Planning in Belo Horizonte, URBEL (URBEL, 1999).

One can observe more developed areas in the favela, with functioning infrastructure such as electricity, plumbing, regular garbage collection, street

lighting, public phones, thriving businesses, and paved streets where private and collective vehicles can circulate. The favela also benefits from public investment from the city such as job training programs, schools, community programs for youth, and a health clinic. All of these features succeed in making AVC look like a typical neighborhood, rather than a slum area.

The photos in the next page show the more urbanized areas in the Alto Vera Cruz favela.

RESIDENTIAL AND COMMERCIAL AREAS IN THE AVC FAVELA



Photo 2



Photo3

In contrast, however, there are less urbanized areas with alleys and paths that are not always paved or well lit, in sections with irregular geography typical of slums areas. These areas are also crowded with shacks and unfinished one or two-storey brick houses, which are homes to one or more families. Illegally built housing units attached to one another with high walls, doors and windows facing the street form labyrinths of narrow paths which result in poor ventilation and lighting, not only for residents, but also for passers-by, who are already used to the foul smell that permeates the air due to the lack of regular water, sewage, or garbage collection services, as can be seen in the following photographs:

ALLEYS IN THE AVC FAVELA



Photo 4



Photo 5

At first glance, Alto Vera Cruz shares a very similar urban social structure with other poor areas in Belo Horizonte. As in any neighborhood, children play in the streets, people shop in local stores and frequent bars where they eat snacks

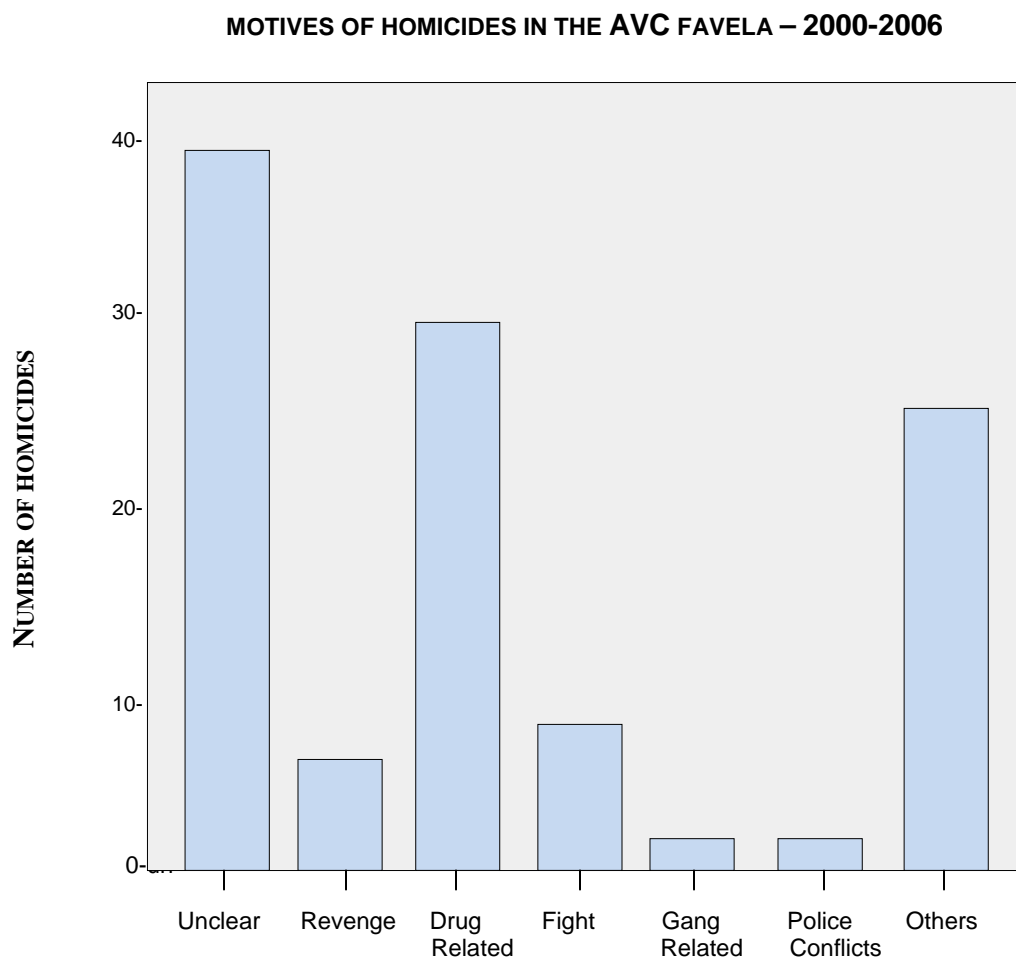
and drink beer and the Brazilian hard liquor *cachaça*. Unlike the other areas, however, in the AVC favela, drug dealers and gang members stand on streets, in front of bars and in alleyways where they blend in with passers-by. The AVC is known as a dangerous place where murders of young men and adolescents from the community are commonplace.

3.3. HOMICIDE PATTERNS

The analysis of secondary data (including 112 homicides committed between 2000 and 2006) obtained from the Homicide Division of the Civil Police in the state of Minas Gerais reveals that homicides in the Alto Vera Cruz favela follow the same patterns as in other violent favelas in Belo Horizonte, and involve victims and suspects with the same socio-demographic profile: young men and adolescents, favela dwellers with criminal backgrounds.

Furthermore, statistical data suggests that most victims were on their way to, or coming from somewhere else when they were killed. Most of the 112 killings examined occurred outdoors, in streets (69%) and alleys (41%).

In addition, official data analysis reveals that most murders are related to drug trafficking. Graphic 1 below sorts homicide distribution by motive, using the classification employed by the Homicide Crime Division of the Civil Police for the state of Minas Gerais:



The graphic above shows that 30 (26.8%) out of 112 murders are related to drug trafficking. Thirty-nine murders (34.8%) have no registered motive. The reason why no motive is registered is that the Homicide Division of the Minas Gerais Civil Police (DCCV-PCMG) only started organizing and systematizing this kind of information into an electronic database in 2005. Also, many murders are still under investigation, and the motives have not yet been determined. Despite

the lack of information, detectives and patrol officers believe the murders are related to either drug debt or dealer disputes.

Local violence has reached a new high on account of two factors, according to officers from the Military Police Precinct who are responsible for controlling violent crime in the Alto Vera Cruz favela: First, a rearrangement of the drug trafficking organization which began in 2000 in the favela; and second, easy access to firearms for young criminals.

Analysis of official data from 2000 to 2006 demonstrates that violence in Alto Vera Cruz reached its highest point in 2005, with 27 registered deaths, as shown in table 1 below:

**NUMBER OF HOMICIDES PER YEAR IN THE AVC FAVELA
N=112 (FROM 2000 TO 2006)**

YEAR	NUMBER OF HOMICIDES
2000	10
2001	2
2002	22
2003	17
2004	23
2005	27
2006	11
TOTAL	112

Source: DCCV-PMMG

In the 1990s, the drug trafficking explosion turned the Alto Vera Cruz favela into a massive marijuana and cocaine sale and distribution center for Belo

Horizonte. However, the arrest of the main dealer in 1998 marked a new split in local drug dealing. This dealer, the widow of a criminal, had dominated not only the drug distribution to local markets inside the favela, but also the points of sale, strategically placed along the former Sumare Street and Andradas Avenue - the main road that links the favela to the city center. A lucrative business was thus maintained, offering higher quality cocaine to high income, cash paying clients from outside the favela.

This gang leader's family members took over her turf following her arrest, but they lost control of drug distribution to other points inside the favela. As a result, a new generation of minor drug dealers comprised of young males with a disposition for murder gained power in drug trafficking in 2000. They had names such as "The Pit Bull Brothers", "the dealers from Augusto Papini Alley", "the ones from Dr Brochado Street", "Buiu and Bebinha's gang," and "Carequinha's gang" in the North part of the favela known as *Buraco de Sapo*. In addition, established dealers such as "the Vieira Brothers" gained greater notoriety in the drug business and, with easy access to firearms, turned the lower part of the favela, known as *Cruzeirinho*, into a most profitable drug sales and distribution center.

The spread of the local drug trade inside the favela accelerated with the increased demand for illegal drugs, especially crack, by lower-income local users referred to as "noias". Difficult access to most points of sale was a major obstacle for the police. With the explosion of violence at the beginning of the 2000s, local

residents recall that finding bodies of murdered young men lying in the streets and alleyways was commonplace. Violence related to debt settlement increased, along with violent conflicts between rival gangs or crime partners. Favela residents live in perpetual fear due to the announced drug “wars.” They are constantly startled by the sound of nearby gunshots, the thunder of footsteps of young men running across their asbestos roofs, and the terror of having their front doors forced open by young criminals frantically seeking a place to hide.

Violence also results when armed drug dealers mark and protect their turf. These “drug lords” not only impose the rules of coexistence in the criminal underworld, they also influence the dynamics of social life in the streets. On any ordinary day in the favela, drug dealers’ lookouts (referred to as “olheiros”) control the main outdoor drug-selling spots. Blending in with passers-by, they stand in strategic spots such as street corners, bar doors, and entrances to alleys. These young criminals, everyday faces in the urban favela scene, stay alert and vigilant. The hilly terrain with steep inclines enables them to spot strangers or any unusual behavior, and most important of all, the arrival of the police, which they announce by setting off firecrackers and shouting “galo.” However, this has changed with the use of mobile phones, which have facilitated communication among gang members in a more discreet way, without attracting police attention.

The “recruiting” of an ever increasing number of young people and the involvement of entire families in illegal drug trafficking have made violence a

mundane occurrence for residents, and killing has become commonplace. Killers and victims are no strangers to one another, or to the community. Dealers and killers are usually linked in one way or another; they may be relatives, neighbors, childhood friends, or schoolmates. To report a killer or drug dealer to the police could mean breaking family ties or old friendships, thus inviting revenge and retaliation, and consequently the killing of the “traitor.”

In most cases, killings are announced in advance, and sometimes there are witnesses, but no one wants to come forward. As a result, investigations are hampered. Peaceful residents have mixed feelings; on one hand they are scared and embarrassed, on the other hand, violence has become so common that they are numb to it.

Thus, the story of violence in the Alto Vera Cruz is reproduced in cycles, interrupted at times by the imprisonment of drug dealers and repeat offenders, which consequently results in the dismantling of gangs, and by truce periods between dealers and the youth involved in crime. However, the cycle of violence starts all over again. All it takes to kill is a motive, and there is never a right time or place to murder someone, as AVC killers explain.

Nevertheless, despite these explanations, the analysis of 112 homicides in the Alto Vera Cruz favela between 2000 and 2006 indicates that these crimes are not as random as criminals want others to believe. During that period, homicides tended to be concentrated on Saturdays and Sundays, as shown in table 2 below:

HOMICIDES BY WEEKDAYS IN THE AVC FAVELA - N=112 (FROM 2000 TO 2006)

WEEKDAYS	NUMBER OF HOMICIDES	PER CENT OF HOMICIDES (%)
MONDAY	12	10.7
TUESDAY	13	11.6
WEDNESDAY	19	17
THURSDAY	9	8
FRIDAY	7	6.3
SATURDAY	23	20.5
SUNDAY	29	25.9
TOTAL	112	100

SOURCE: DCCV-PCMG

The concentration of homicides on weekends seems to be related to the fact that there are more people in bars, and drug traffic intensifies during this time, attracting motivated offenders and potential victims to the same places at the same times, as suggested by the Routine Activity approach. Most homicides also tend to occur between 7:00 p.m. and 6:00 a.m., as shown in Table 3 in the following page:

TEMPORAL PATTERNS OF HOMICIDES IN THE AVC FAVELA - N=112 (2000 TO 2006)

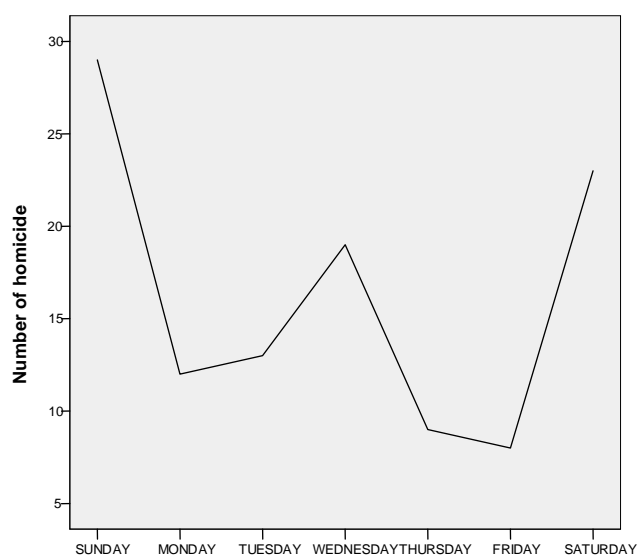
TIME OF DAY	NUMBER OF HOMICIDES	PERCENTAGE (%)
MORNING (6am-12:59am)	11	9.8
AFTERNOON (1pm-4:59pm)	12	10.7
EVENING (5pm-6:59pm)	9	8
NIGHT (7pm-12:59pm)	28	25
EARLY MORNING (1am-5:59am)	25	22.3
UNKNOWN	27	24.1
TOTAL	112	100

Source: DCCV- PCMG

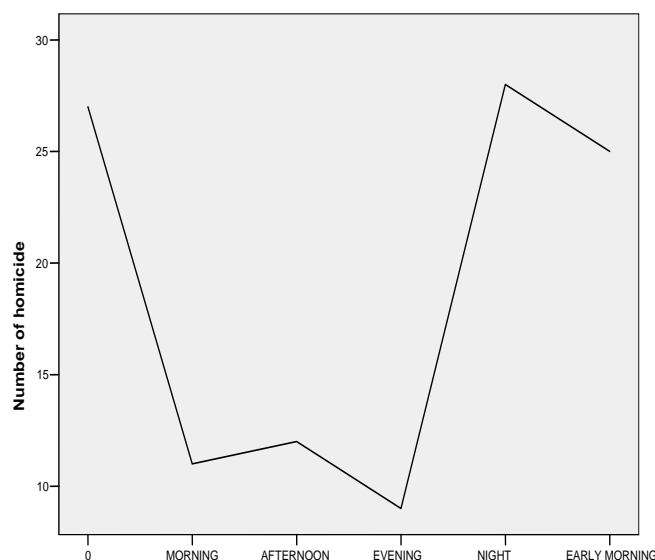
The concentration of homicides during weekdays as well as at night and in the early mornings is also shown in the following graphs:

GRAPH 2: HOMICIDES BY WEEKDAYS IN THE AVC FAVELA

N= 112 (FROM 2000 TO 2006) – SOURCE: DDCV- PCMG



GRAPH 3: HOMICIDES BY TIME OF DAY IN THE AVC FAVELA
 N=112 (FROM 2000 TO 2006) - SOURCE: DCCV -PCMG



Temporal patterns of homicides, as shown by statistical data, are corroborated by the statements of AVC murderers. One crucial situational factor is that of the offender carrying a weapon when he meets the potential victim. According to offenders' statements, being armed at night is less risky, since police patrol the area during the day, and individuals can be arrested for carrying a gun without a permit. Thus, during the day, young offenders aren't always armed, except when traffickers are at war. However, that doesn't mean their guns aren't close by. As they themselves state, their guns are always hidden somewhere near the area of the drug sales, where they spend most of their time. Another important factor that explains why most homicides occur at night and in the early morning is that potential killers wait to assault their victims at their most

vulnerable moments, when the victims are unaccompanied by fellow gang members.

AVC killers say that most people involved in drug trafficking are old childhood friends who routinely stand watch at corners, close to alleys and roads, and at bar doors, selling drugs and controlling their territory. When offenders threaten each other, they do so openly to display their fearlessness. Recognizing that they are in danger, the partners of those who are threatened increase their vigilance, to protect their fellow gang-member. Allies warn one another of the presence of the enemy and stay alert. During the day, when partners protect one another, the potential victim has a better chance of surviving. It is hard for killers to catch their victims unaware and take them by surprise because the victim's friends will issue a warning when an enemy approaches. The best time to attack is when the victim is distracted, reducing the need for the element of surprise.

In addition, some factors facilitate the encounter between offender and victim during late night and early morning hours: there are fewer people in the streets, there is less drug-selling activity, and the offenders are carrying guns. In addition, potential victims are more likely to be alone when going back home through streets and alleys, which are also familiar to their enemies. As the drug dealers say, this is the time when dudes must be really brave to walk around by themselves in the favela.

3.4. THE CRIMINALS' POINT OF VIEW

According to those who have committed homicides in the Alto Vera Cruz favela, homicides here were not typically motivated by drug trafficking, but by more traditional motives such as hate, envy, jealousy, for money, vengeance, and self-protection against enemies. The local story of violence goes back a long way, explained by old rivalries, interpersonal conflicts and retaliation among young men involved in criminal activities, most of whom live in two so-called “rival” areas of the favela, *Cruzeirinho*, in the lower part, and *Buraco de Sapo*, in the upper part. The real reasons for rivalry are lost among the new generations of outlaws taking the place of the older ones who are killed or imprisoned.

Thus, today's killers and criminals keep the tradition of discord and retaliation alive between *Buraco do Sapo* and *Cruzeirinho*. Intruding into the rival's territory is taboo. Young males involved in crime don't trespass into areas within the favela that are considered “enemy territory,” confining themselves geographically to the immediate areas where they live and deal drugs.

However, the motives among criminals in the favela also go beyond old territorial feuds; they are part of a way of life unique to the criminal population. For the outlaws in the Alto Vera Cruz favela, willing to kill and be killed is a prerequisite to remaining in the criminal world. For them, crime does not allow for mistakes to be made. A criminal has to know how to behave and live a criminal life. He has to behave correctly according to the tenets of criminal expectation;

he has to have his mind focused on the criminal task. If someone makes a mistake, e.g. if he does not obey criminal commandments such as “don’t tell on others”, “don’t rape and rob within the favela”, “don’t go after others’ women”, “don’t betray your partner”, “don’t steal drug from points of sale” – he is at risk of being killed by other criminals.

Thus, in the criminal world of the favela, the power to kill someone is the baseline rule applied for resolving conflicts, often caused by fights over women, or on account of an evil stares from an unknown individual, or a known friend or foe. The act of killing can also be a means of making easy money, getting even with enemies, settling scores, winning the respect of peers, and letting others know who is in charge. The fear of death is thus rationalized by the affirmation that “everyone will die one day,” and what matters is to “die like a man,” facing the enemy with gun in hand.

3.5. CHALLENGES FOR THE POLICE IN CONTROLLING AND PREVENTING VIOLENCE

Just as the criminals do, many police officers who work in the AVC favela reside there. They usually know the criminals and their disputes, and often are well informed about who is threatening to kill whom. However, the police face many challenges in preventing and controlling violence in the AVC favela. One of the difficulties is to get people to testify in homicide cases. Under threats from

offenders, residents of the AVC favela are often reluctant to collaborate with the police.

At a typical murder scene, a lot of favela dwellers – elders, adults, adolescents as well as children – stand around the victim's body until the police arrive. They keep quiet in the presence of the police, looking upset and scared but also familiar with that scene. As for the police, most are acquainted with the victims, whose imminent death was probably announced earlier. However, nobody wants to be involved as witnesses. As the police investigation depends heavily on subjective, rather than material evidence, (due to the absence of adequate technological tools for crime investigation), the rate of indictment is very low – e.g., of 112 homicide cases that occurred between 2000 and 2006, the researcher found that 74 cases (66.07%) were still under investigation in 2007.

Another difficulty faced by the police is the complex geography of the favela. Criminals who are lifelong residents of the favela and know the intricate sharp curves and unexpected bends and turns of their neighborhood, have a distinct advantage over the police. These criminals know exactly where in the favela it is easiest to get away with crime. In addition, lookouts positioned in the outer parts of the favela give advance warning of the arrival of the police, making it difficult for the police to catch offenders red handed. Criminals often have plenty of time to hide their weapons or drugs, or escape to some place within the

favela. In response, the military police have combined various strategies and quasi-military tactics to try to outsmart the criminals, such as:

1. Tactic Patrol - a policing initiative formed by two patrol groups comprised of five police officers. Each patrol works in alternating 8 hour shifts. Under the responsibility of the precinct commander, its main function is to respond to violent crimes, apprehend fire arms and combat drug trafficking. Although Tactic Patrols are by nature reactive, these groups always exercise preventive surveillance in areas of the Alto Vera Cruz favela that are difficult to reach. Based on military training, they always enter the favela via different entrance points in order to surprise criminals. At night, they walk through the alleys with guns in hand, one behind the other, several feet apart. The first officer in line is a kind of scout. The second officer is responsible for looking out for the man in front of him and the man behind. The third officer in this group of five is always the commander of the group. The officer behind the commander watches the rooftops for criminals, to protect the group against assaults. The last officer in line watches the rear. The main idea is to send a message to criminals that they do not have control over the favela, it is the police who do.

2. The GEPAR – the military police unit that specializes in policing violence-ridden favelas through community police work and qualified repressive action based on intelligence. The main function of this group is to reduce drug trafficking and violence. The GEPAR was initiated in 2005, and is comprised of three patrol groups with three police officers each, working in alternating eight-hour shifts, thus guaranteeing 24-hour policing in the favela. The responsibility of this group is to control, map and monitor gang groups, and to make residents feel safer. The GEPAR has also contributed to a positive change in public opinion toward the police, who are often viewed as a repressive force entering the favela only to fight offenders.

3. Strategic Intervention based on a partnership between the Military Police, the Judiciary Police, including the Homicide Division of the Civil Police, prosecutors and courts. The main goal is to ensure an exchange of information between these organizations in order to accelerate the judicial process for issuing search warrants, as well as arrest warrants for dangerous repeat offenders. As a result of this initiative, integrated sweep operations have been developed by both the Military and Judiciary police organizations in order to bring criminals to justice, thus reducing impunity in the favela.

4. Intelligence: Undercover police officers carry out the investigative work of obtaining information about the most dangerous criminals in the favela (where they live and hang out, their networks and criminal activities, their gang affiliation, rivalries and disputes) and the location of drug trafficking spots.

Not only has the diligence of the police in monitoring and catching criminals been important for the integration and exchange of information between the police and other criminal justice agencies assisting the investigative work of the Homicide Division of the Civil Police, it has reduced fear in the community. However, while the police say that crime in the favela will never end because there is always another criminal to substitute for the one who was arrested, they believe they can reduce criminal activities by letting criminals know they will be caught.

OVERVIEW

Chapter 3 begins with a brief description of how and why the Alto Vera Cruz favela was chosen as the place to explore the relevance of situational opportunities for homicides. Next, it describes the favela, presenting a geographical and temporal analysis of homicide patterns inside its area. In addition, it relates the reality of violence in the AVC favela through narrative

accounts provided by criminals who live there, as well as police officers who patrol the area attempting to keep the peace.

2**LITERATURE REVIEW**

4

REVIEW OF THEORIES AND MAIN RESEARCH FINDINGS

Chapter 4 begins with a brief review of pioneering studies and research findings that take into account the environment as an important unit of analysis for the explanation of crime. These studies, developed across the nineteenth and twentieth centuries, have contributed to the emergence of what has been named Environmental Criminology. This theoretical framework uses practical concepts to explain crime at the ground level of everyday life and situational circumstances, and has become a link between traditional and contemporary criminology.

According to Wortley and Mazerolle (2008), Environmental Criminology is defined as “a family of theories that share a common interest in criminal events and the immediate circumstances in which they occur” (Wortley and Mazerolle, 2008:1). Within this new perspective are included the Routine Activity approach, the Rational Choice perspective, the Crime Pattern Theory and the Situational Crime Prevention model. Chapter 4 reviews each of these approaches and their main contribution to explaining, through useful concepts, how and why crime occurs.

In this study, Environmental Criminology provides the fundamental theoretical framework for the exploration of homicide at specific locations, as well as the main principles underlying the research questions and hypotheses.

Additionally, this chapter reviews the main research findings that have helped to consolidate the relevance of the environment and situations in explaining homicides.

4. 1. PRIOR STUDIES ON CRIME

In the nineteenth century, pioneering studies on the geographical patterns of crime played an important role in the emergence of modern criminology. The relevance of geographical location to crime was pointed out by French and English cartographers and statisticians (Guerry, 1883; Quetelet, 1842; Glyde, 1865). Studying crime rates at the macro level of analysis, these researchers found that crime does not occur by chance.

Studies conducted by André-Michel Guerry, 1883, and also by Adolphe Quetelet, 1842, showed that crime rates in France were not homogenously distributed across the country, but varied significantly across regions, states, cities or provinces, as well as urban and rural areas (Brantingham and Brantingham, 1997, 1981; Sherman *et al.*, 1989). Additionally, they showed that distribution of crime patterns in space vary accordingly to the types of crime. For example, there are major differences between geographical patterns of violent and property crimes in the provinces of France. Violent crimes were concentrated in poor rural provinces while property crimes were mostly located in wealthy and industrialized ones (Brantingham and Brantingham, 1981, Wortley and Mazerolle,

2008). One of the main contributions of these studies to the growth of the environmental perspective on crime is to show that “*poverty did not cause property crime, but rather opportunities did*” (Worthley and Mazerolle, 2008:4). Furthermore, pioneering studies showed that crime patterns vary depending on the availability of targets and characteristics of policing in certain geographical areas. An important study conducted by Henry Mayhem and his associates (1862) showed that areas where crime was persistent, (e.g. “thieves” quarters popularly known as “rookeries” in metropolitan London), were spatially positioned to take advantage of the distribution of victim targets as well as of the difference in the quality of policing in many of London’s municipal jurisdictions (Brantingham and Brantingham, 1981).

In sum, pioneering studies present a broad and more descriptive analysis of the geographical patterns of crime. Although these studies do not provide a theoretical framework to explain how and why crime occurs, their main contribution to the progress of modern criminology is to foreshadow the importance of the environment as a unit of analysis for the understanding of crime.

4.2. AN ECOLOGICAL PERSPECTIVE ON CRIMINALITY

In the twentieth century, between 1900 and 1970, a new wave of studies on crime shifted the analysis from mere description of the geographical

distribution of crime to the investigation of the importance of features of neighborhoods where crime flourishes and from where offenders originate. The sociological roots of individual motivation became the center of the academic debate on criminal behavior (Brantingham and Brantingham, 1981; Herbert, 1989). Major studies on criminality in the early twentieth century were influenced by the Social Ecology theory of the Chicago School of Sociology, founded on the idea that human behavior, like that of plants and animals, is influenced by individuals' natural habitat, and should be studied as part of the whole (Wortley and Mazerolle, 2008). Based on this idea, criminal behavior is perceived as a result of social structural factors as well as physical environmental characteristics (see Burgess, 1916; 1925a; Shaw and McKay, 1929; Robert Park, 1952). The fundamental research question of academics and researchers (Burgess, 1925a; 1925b; Thrasher, 1927; Shaw and McKay, 1942) during this period was to explain why some individuals commit crimes and others do not, and why certain types of crime occur within particular communities and not others (Brantingham and Brantingham, 1981). In addition, the relevance of social environment features at a meso-level of analysis, such as sub-areas of cities, for example, communities or neighborhoods, were considered important factors for the understanding of criminal behavior.

According to Wortley and Mazerolle (2008), researchers of the Chicago School – Robert Park, Ernest Burgess, Clifford Shaw and Henry McKay, – applied the main principles of ecology to explain the relationship between

“migration trends within urban communities and the effects on criminal activity and other forms of social disorder” (Wortley and Mazerolle, 2008:4-5). The main point is to explain the organization of human life through an ecological perspective. In this context, the city was conceptualized as a “super-organism” comprised of symbiotic relations between sub-communities, and between individuals who lived within it, thus maintaining its ecological equilibrium.

A classical study conducted by Burgess, 1928, divided the city into five concentric zones: Zone I, at the center of the city where the business district was located; Zone II, around the center, where the poor people live in dilapidated houses; Zone III, the commercial area, where people who have escaped from living in Zone II work and live in modest homes and apartments; Zone IV, the residential section comprised of single houses and expensive apartment buildings; and finally, Zone V, a commuter zone, in which desired suburbs and satellite cities are concentrated. However, with population growth, changes in this city pattern tend to occur due to a natural process of invasion, domination and succession, with people migrating from one zone to another – the same process that explains changes in the natural world as when *“a new plant may invade and dominate an area until it becomes the successor species”* (Wortley and Mazerolle, 2008:5).

The classical study conducted by Shaw and McKay – *Juvenile Delinquency and Urban Areas* (1969), showed that delinquency was concentrated in Zone II, the poorest neighborhood in the city. This phenomenon

is explained not only by the lack of effective social and economic support mechanisms but also by the availability of opportunities for criminal activities in this area. Additionally, neighborhoods in Zone II are under pressure from two kinds of invasions – one due to the expansion of business and industry from Zone I, which results in a reduced number of places to live, most of which are deteriorated houses and buildings that will be further torn down to make way for new businesses and industries; the second due to increased flux of the poorest people and recent immigrants into the city, moving into the area because it has the cheapest places to live. As a result, the natural process of symbiotic relationships in Zone II is destroyed, and this increases social disorganization, including delinquency and gang conflicts among youth of different cultures. As a result, this process of social disorganization tends to persist through cultural transmission.

Despite the contributions of the Chicago School toward an ecological perspective on crime, they did not challenge traditional criminology focused on the link between criminality and delinquency. Instead, the contributions were restricted to the examination of the social roots of individual criminal motivation, with the focus of analysis on the features of the disadvantaged neighborhood in which crime flourishes. Therefore, the significant contribution of the ecological approach to the understanding of criminality within the large context of communities, has not, however, helped to explain the near causes of crime and why crime happens. As a result, this approach has limited implications for crime

reduction policies. As Brantingham and Brantingham (1981) argue, one of the main arguments against the Chicago School is that it makes inferences about individuals based upon aggregated data, a problem referred to as an “ecological fallacy.” As a result, ecological studies tend to lead to the biased conclusion that poor, densely populated neighborhoods where criminals come from identify areas where crime prevention programs should be undertaken, as well as individuals likely to commit crimes (Brantingham and Brantingham, 1981).

In parallel to the Chicago School, a classical study by Jane Jacobs – *The Death and Life of Great American Cities*, (1961) influenced the emergence of an environmental perspective on crime. In a different way, Jacobs was more interested in street level analysis within inner-city areas of large American cities (Cozens, 2008:154). Her main contribution to the progress of the environmental approach on crime is her assumption that poor conditions of neighborhoods do not predict crime. Instead, crime flourishes when “residents feel isolated and anonymous, and believe that they have no stake in their neighborhood” (Wortley and Mazerolle, 2008:6). Thus, even disadvantaged neighborhoods could be well maintained, and free of crime, through the implementation of modern urban design principles which emphasize diverse and mixed land use getting people out on the streets, thus strengthening social networks and increasing informal surveillance. Jacob’s main idea is to keep residents’ eyes on the streets in order to increase community safety.

According to Wortley and Mazerolle (2008), Jacobs' work introduced new premises in city planning such as:

1. Residential areas should include industrial, commercial and recreational activities, thus promoting social interaction among residents during all times of the day.
2. City districts should be divided into small blocks, providing many interconnections and accesses, and avoiding "deserted backstreets and other dead zones" (Wortley and Mazerolle, 2008:6.)
3. City districts should mix new and old buildings, supporting diverse enterprises and activating the dynamics of social life.
4. Population density should be sufficiently concentrated, maintaining diversity and facilitating interaction among local residents.

Although 50 years have passed since the publication of *The Death and Life of Great American Cities* (1961), Jacob's ideas remain pertinent, and have inspired the development of practical and innovative crime prevention measures

focused on environmental planning and architectural features of communities as discussed below.

4.3. THE RELEVANCE OF THE BUILDING ENVIRONMENT ON CRIME

At the beginning of the 70s, an alternative approach to the social ecology theory of the Chicago School was introduced through the work of C.R. Jeffrey, *Crime Prevention through Environmental Design, CPTED* (1971) and the work of Oscar Newman, *Defensible Space: Crime Prevention through Urban Design* (1972). Influenced by Jacob's model, Jeffrey and Newman applied urban planning and architectural concepts to crime reduction measures at the immediate build environment level. This innovative approach created the foundation for the emergence of the modern environmental perspective in criminology, as stated by Wortley and Mazerolle (2008).

Jeffrey's CPTED model was influenced by Skinner's (1953) behavioral psychology theory, according to which behavior is controlled by its consequences (Cozen, 2008; Wortley and Mazerolle, 2008.) Thus, the core idea of this approach asserts that interventions of crime reduction measures in the physical environment are aimed at decreasing the rewards and opportunities for criminal behavior, influencing offenders' decisions to offend or not to offend. As a result, CPTED's strategies are based on concepts such as the following (see Cozen, 2008):

(1) Territorial reinforcement which includes measures promoting a sense of ownership and informal social control by legitimate users of a given space, such as access control and surveillance through symbolic, as well as real, barriers.

(2) Natural surveillance referring to measures that increase surveillance by residents, through windows and residential design, formal surveillance by police and security patrols, as well as mechanical surveillance such as CCTV and street lighting.

(3) Natural access control including measures that reduce opportunities for crime, and increase offenders' perception of risk in the form of security personnel as well as locks and bolts.

Jeffrey's main contribution was to recognize that criminal behavior cannot occur without opportunity. As Jeffrey (1977) states, "*there are no criminals, only environmental circumstances that result in criminal behavior. Given the proper environmental structure, anyone will be a criminal or a non-criminal*" (Jeffrey 1977:177 in Wortley and Mazerolle, 2008:9.) According to Wortley and Mazerolle (2008), Jeffrey's argument is perhaps the most radical within the environmental perspective on crime.

Concomitant to Jeffrey's idea, Newman's concept of defensible space states that changes in specific residential design features would reduce crime, by increasing a sense of community and territorial pride, thus engaging dwellers' responsibility in ensuring a safe space for their families, neighborhoods and friends (Wortley and Mazerolle, 2008). Newman's approach stressing the relevance of build environment on crime prevention was advanced at the end of the 1970s, when a new wave of empirical research investigated the relevance of geographic space and social scenery of crime locations in describing and explaining crime itself. According to Brantingham and Brantingham, 1981:

"Locations of crimes, the characteristics of those locations, the movement paths that bring offenders and victims together at those locations, and people's perceptions of crime locations all become substantially important objects for research from this shift perspective" (Brantingham and Brantingham, 1981:21).

According to Cozen (2008), although Newman's model added innovative pragmatic measures to crime prevention, his work is criticized for "neglecting the role of social factors (Merry 1981; Smith 1986, 1987; Taylor et al. 1980) and for making unjustified and unscientific generalizations (Adams 1973; Bottoms 1974; Hillier 1973; Kaplan 1973; Mawby 1977; Mayhew 1979.)" (Cozen, 2008:157.) However, Newman recognizes in his publication during the 1980s that "characteristics of the residents were stronger predictors of crime levels than design features" (Cozen, 2008:157).

4.4. THE BROKEN WINDOWS MODEL

Following the tradition focusing on the role of community features on criminal behavior, the Broken Window thesis, developed by Wilson and Kelling (1982), reveals the influence that social disorder and physical deterioration – all signs of urban decay within the community, have on residents' increased fear of crime, and further, on the occurrence of vandalism, and delinquency (Wilson and Kelling, 1980; Kelling and Coles, 1996). This concept relies on the findings of psychologist Phillip Zimbardo (1960), according to whom “individuals engage in deviance when there is evidence that an area is without controls *vis-a-vis* visual cues indicating that criminal behavior is acceptable” (Wagers *et al.* 2008:248). The eight main ideas of this approach are:

- “1. Disorder and fear of crime are strongly linked.
2. Police (in the examples given, foot patrol officers) negotiate rules of the street. “Street people” are involved in the negotiation of those rules.
3. Different neighborhoods have different rules.
4. Untended disorder leads to the breakdown of community controls.
5. Areas where community controls break down are vulnerable to criminal invasion.
6. The essence of the police role in maintaining order is to reinforce the informal control mechanisms of the community itself.
7. Problems arise not so much from individual disorderly persons as it does from the congregation of large numbers of disorderly persons.
8. Different neighborhoods have different capacities to manage disorder” (Wagers *et al.* 2008:253).

According to the “broken windows” approach, neighborhoods with physical and social signs of neglect, such as abandoned buildings, broken windows and

lights, concentration of trash and litter on streets, and graffiti, cause fear among community residents. As a result, stable residents move out from the community, increasing anonymity among those that remain, and, consequently, reducing informal social control mechanisms in public spaces. Serious offenders are attracted to such communities, thus increasing the spiral of social disorder and criminal behavior. Given the relevance of intervening in public disorder and improving the physical aspects of deteriorated neighborhoods to address safety concerns in the communities, the “broken windows” thesis is “perhaps one of the most influential theories to be developed within the confines of CPTED (Cozen, 2008:158).

However, Wilson and Kelling’s thesis is criticized by the work of Sampson and Raudenbush (1999) who suggest that collective efficacy – the ability of a community’s residents to realize common values and maintain effective social controls within the community – matters more in predicting crime than does public disorder. Based on analysis of social deterioration on the streets of Chicago, Sampson and Raudenbush (1999) showed that disorder was not significantly related to most forms of serious crime, with the exception of robbery, when factors such as poverty, stability, race, and collective efficacy, were considered.

Despite the criticism, “broken windows” is nevertheless a useful crime prevention concept for public policy makers as well as for the police as it responds to citizen’s demands for the maintenance of order and for the

improvement of quality of life within communities (Wagers *et al.*, 2008; Kelling and Sousa, 2001). It brings important insights with respect to the integration of the environmental perspective on crime and the features of the community in the short term.

Parallel to the emergence of the “Broken Windows” model in the 1980s, a new wave of studies focusing on micro units of analysis, such as settings, places, and facilities revealed, through empirical evidence, the role of immediate circumstances on crime. These studies radically shift the focus from the traditional criminological approach on criminality to the crime event itself, creating a more solid basis for the emergence of Environmental Criminology. Some of these findings have been discussed above.

4.5. MAJOR RESEARCH FINDINGS ON CRIME AT SPECIFIC PLACES

In 1989, Lawrence W. Sherman and his colleagues brought new insights to the study of crime in specific places with the concept of hot spots, in other words, the concentration of crime within very small areas. Studying crime in Minneapolis, U.S.A., these experts showed that only three percent of the addresses in the city produced 50 percent of all calls to the police. This study revealed that even within the most complex communities, crime was clustered in a few discrete locations, leaving blocks in other areas relatively free of crime.

This finding supports the study conducted by Wolfgang *et al.*, 1972, which compared crime data in Minneapolis and a concentration of crimes in a 1945 Philadelphia cohort. This study revealed “that 18% of the individuals produced over 50% of the arrests, compared to the 3% of places producing 50% of calls in Minneapolis” (Sherman, 1995:36). According to Sherman (1995), this demonstrates that the concentration of crime in a few places is even greater than the concentration of crime among individuals.

Additionally, Eck and Weisburd, 1995, show that places, when considered in a micro context, are reflective of the larger social environments of communities and neighborhoods of which they are a part. Places are defined as a very small area, usually a street corner, building or addresses (see Green, 1996; Sherman *et al.*, 1989), facilities (see Clarke and Eck, 2005), clusters of addresses, blocks or street segments (see Sherman and Weisburd, 1995; Taylor, 1997; Weisburd *et al.*, 2004). The features of places are considered key factors in explaining hot spots for crime, because they generate opportunities for motivated offenders to commit crimes, thus increasing crime over long periods (Sherman *et al.*, 1989).

The importance of focusing on where crime occurs is also suggested by Eck and Weisburd, 1985, whose findings showed that offenders do not move randomly in geographical space, rather they interpret and evaluate the environment, deciding to locate their targets at specific places and times. This finding is supported by a study conducted by Braga, 2003, on the problem of serious youth gun violence in the United States. This study shows that gun

violence is highly concentrated among serious offenders, in high-risk places, at high-risk times. This study concluded that:

“Between 1987 and 1990, half of Chicago’s gang-related homicides occurred in only 10 of 77 communities. In Minneapolis, nearly two-thirds of homicides were clustered in only eight of its 95 neighborhoods. In Boston, gang turf covered only 3 percent of the city’s total area, but over 25 percent of the city’s youth homicides, gun assaults, weapons offenses, and shots-fired calls for service occurred there. In Boyle Heights, spatial analyses revealed that youth gun homicide was concentrated in specific hot spots, in and around gang hangouts. Most of the Boyle Heights youth gun homicides were considered to be predatory, as perpetrators invaded rival gang territory to commit them....In Boston, most youth gun violence occurred in the afternoon hours immediately following school release, as well as during weekend evening. In Kansas City, Mo., computer analysis of gun crime hot spots within a beat revealed that most gun violence occurred between 7 p.m. and 1 a.m.” (Braga, 2003:5).

The importance of places on explaining crime concentration as described above is also supported by a series of other studies (Brantingham and Brantingham, 1999; Eck *et al.*, 2000; Spelman, 1995; Weisburd and Green, 1994; Weisburd *et al.*, 1992). These studies have opened new areas of investigation in which the environmental perspective forms the theoretical foundation. According to Eck and Weisburd, 2004, five new areas of research help criminal justice practitioners, criminologists and policy makers understand the importance of place on crimes. These are: (1) crime concentration in particular facilities; (2) the high concentration of crime at specific addresses, and the absence of crime at others; (3) the crime-prevention effects that exist in some places; (4) the mobility of offenders; (5) and studies of how offenders select targets.

Furthermore, the importance of places with respect to crime suggests not only the need for advancing criminal theories regarding places, but also more efficient crime prevention policies. In the 1980s, a series of research studies conducted by Ronald Clarke at the U.K. Home Office (Clarke, 1992) showed that crime can be reduced by developing more cost effective responses, based on small changes in situational opportunities for specific categories of crime through the increasing of associated risks and difficulties for offenders, and by reducing the rewards for crime (Clarke, 1995:91).

According to Braga, *et al.* 1997, there is some criticism of the importance of place-oriented strategies in violent crime prevention due to the fact that “violent crime is less amenable to situational interventions because it is less likely to cluster in time and place (Gabor, 1990; Heal and Laycock, 1986,) and it is committed by deeply motivated or desperate offenders.” Braga and his colleagues (1997) show, however, that violent crimes are also affected by situational circumstances such as the presence of lethal weapons, as well as the features or dynamics of the location in which violent situations arise.

According to Clarke and Eck, 2005, a comparative study of homicide rates from 1980 to 1984, in the U.K. and the U.S. revealed that the higher rate of murder in the U.S. – which was 8.5 times greater than in England and Wales during the period under study, was explained by the wider availability of guns - especially handguns - in the U.S. A similar study, comparing homicide and assaults rates between Seattle (U.S.) and Vancouver (Canada) from 1980 to

1986, showed that despite the slight difference between assault rates in both cities, the higher rate of homicides in Seattle is explained by the easy availability of handguns in this American city, in contrast to Vancouver where access to possession of handguns is restricted. The main contributions of these studies is to show that altering crime facilitating criminogenic situations leads to practical crime prevention responses more effectively than by trying to change individual behavior.

In addition, Braga, 2003, states that police can prevent violence by focusing on high-risk places at high-risk times. This has been demonstrated by numerous problem-solving policing projects that have been implemented in order to respond to gun crime and gun violence hot spots, such as the Kansas City Gun Project, and its replications in Indianapolis and Pittsburgh (see Braga, 2003:9).

In sum, the usefulness of expanding empirical research on crime in micro places is supported by contemporary crime approaches within the environmental criminology perspective, such as the Routine Activity Theory (Cohen and Felson, 1979; Felson, 1994), the Rational Choice Perspective (Cornish and Clarke, 1986), the Situational Crime Prevention Model (Clarke, 1983, 1992), and the Crime Pattern Theory (Brantingham and Brantingham, 1981, 1993). These environmental perspectives shift the focus of interest away from the conventional study of criminality and individual criminal motivations to the crime event itself, as the main unit of analysis (see Clarke, 1980; Brantingham and Brantingham,

1981). They seek to explain the relationship between the concentration and persistency of crime in small places over time, and the relevance of features of physical spaces, situations and opportunities to the offender decision-making process (Weisburd *et al.*, 2004; Weisburd, 2002; Brantingham and Brantingham, 1975; 1981). The main principles of each of these new approaches to crime are discussed in the following section.

4.6. ENVIRONMENTAL CRIMINOLOGY

The new perspectives of crime, under the Environmental Criminology rubric, are based on the assumptions that “opportunity makes the thief” and that some individuals are criminally motivated (see Brantingham and Brantingham, 1978; Felson and Clarke, 1998). These approaches differ from traditional criminological assertions whereby crime is seen as a special case, with deviant behavior and general social problems at its core. They also bring together new principles and concepts in order to investigate and explore the causal relationship between features of places, immediate situational opportunities and crime.

4.6.1. THE ROUTINE ACTIVITY THEORY

The Routine Activity Theory (RAT) was originally developed by Lawrence Cohen and Marcus Felson (1979) in order to understand and explain how predatory crimes occur. RAT explores the role that immediate conditions, such as opportunity, temptation, and inadequacy of target protection, play in encouraging a motivated offender to commit a crime (Clarke and Eck, 2003; Felson and Clarke, 1989). As a consequence, criminal acts are seen as the result of an interaction between an offender's disposition and situational factors. The offender's rationale is an implicit element of RAT. According to this theory, the offender makes a decision to commit a crime based on judgment of immediate situational factors made during the course of everyday routine activities such as going to work, shopping or during leisure activities (see Braga, 2008; Felson, 1994; Felson and Clarke, 1989). How and why criminals decide to rob or kill, changes over time depending on what is happening in their daily life – in other words, based on “where people are, what they are doing, and what happens to them” (Clarke and Felson, 1993:3).

RAT posits that crime is a physical act (Clarke and Felson, 1993) and an ordinary event in the real world. RAT also posits that everyone is capable of rationalizing crime (Felson, 1994), thereby sidestepping considerations of the individual's socioeconomic, racial or psychological motivation for committing a crime. Furthermore, a likely offender is considered a given. However, some

people are more motivated to commit crimes than others. Whether this motivation will be translated into an unlawful act depends on the opportunities available at a specific time and place. Therefore, the central core of RAT is to understand how crime happens rather than to address the offender's motivations.

As Felson and Clarke, 1989, indicate:

“...no crime can occur without the physical opportunities to carry it out. Whatever one's criminal inclinations, one cannot commit a crime without overcoming its physical requirements. Since crime opportunities are necessary conditions for crime to occur, this makes them causes in a strong sense of the word. At the same time, many people from uncaring or broken homes have never committed crimes, and many people from good families in comfortable circumstances have become active offenders. No theory about individuals can claim that it has found the necessary conditions for a person to commit crime. To be sure, no single cause of crime is sufficient to guarantee its occurrence; yet opportunity above all others is necessary and therefore has as much or more claim to being a “root cause” (Felson and Clarke, 1989:1).

RAT is a practical approach that attempts to explain how changes at the social and macro levels contribute to increase (or reduce) the opportunities required for a criminal act to be committed.

One of the most interesting results of RAT was to show that the escalation in residential burglary in the United States and Western Europe during the 1960s and 1970s was due to changes in routine activities of a large number of women who began participating in the workforce as full-time paid workers, consequently increasing the number of empty homes during the day. At the same time, the rise in burglaries can also be explained by the increased availability of attractive items to be stolen from homes, which was demonstrated by the rise in sales of

portable televisions, videos, and other lightweight electronic goods. One of RAT's main assertions is that the lack of effective control mechanisms makes some individuals, properties, and settings suitable targets from the likely offender's point of view.

RAT theorists' main position is that, in order for a crime to occur, three minimal elements have to come together at the same time and place:

(1) **A likely offender.** Someone who is likely to commit a crime, for whatever reason.

(2) **A suitable target.** This could be either a victim, or an inanimate crime target, such as an object, or a place that can be stolen or invaded by an offender. Cohen and Felson (1979:591) define target suitability for crime by value, inertia, visibility, and access. These four attributes are summarized by the acronym VIVA. Stemming from VIVA, another acronym, CRAVED, was created to further the concept, encapsulating six attributes of goods most likely to be stolen by thieves: Concealable, Removable, Available, Valuable, Enjoyable, and Disposable (Clarke, 1999).

(3) **The absence of a capable guardian against crime.** Capable guardians are defined as all formal or informal control

mechanisms and security devices that are effective in deterring a motivated offender from committing a criminal act. Examples of capable guardians include: neighbors, friends parents, relatives, bystanders, neighborhood watch groups, closed circuit television (CCTV) system, alarm systems, locks, fences, barriers, lighting, the owner of the place or property targeted, door staff, vigilant staff and co-workers, and security guards.

For RAT, police are not considered to be the most likely persons to prevent a crime, in most cases because they “seldom are around to discover crimes in the act”, as stated by Clarke and Felson (1993:3). In addition, the existence of an unguarded target is a major condition for a likely offender to perpetrate a criminal act. Thus, if a capable guardian is present, a crime is less likely to happen, but if the guardian is present but powerless, corrupt or weak, a crime might occur.

The convergence of all the minimal elements necessary for the commission of a crime in time and space make up the central premise of the RAT. If one of these elements is absent, it follows, according to RAT, that the crime cannot be completed. Cohen and Felson (1997) summarize RAT’s main ideas in a practical tool for crime analysis, known as the basic crime triangle, represented below:

GRAPH 4: THE BASIC CRIME TRIANGLE



SOURCE: www.crimereduction.homeoffice.gov.uk

The Basic Crime Triangle helps to analyze each of the dimensions of a specific crime event, its objective features and patterns, and the way in which each one of its elements may contribute to the creation of an opportunity for a specific crime to be completed. The tool is considered valuable for the development of crime prevention and control techniques. RAT's Basic Crime Triangle highlights the idea of location as one of the main components of any crime problem (Eck and Clarke, 2003).

In 1986, Professor Marcus Felson introduced the concept of “intimate handling” to understand the dynamic of crime events. His primary premise is that, “for a direct contact predatory crime to take place, a motivated offender must meet a suitable target in the absence of a third party who might avert the crime: a capable guardian who might protect the target, or an intimate handler who might demotivate the offender” (Tilley, 1997:100).

In 1994, John Eck introduced the concept of “place manager”, a third category of crime controllers. The main idea is that “the people who manage places – store clerks, life guards, park rangers, airline attendants, and countless

others – also control crime by regulating the behavior of place users” (Sherman, 1995:38-9).

The most recent formulation of the Crime Triangle is presented by John Eck and Ronald V. Clarke (2003) who combine the original Crime Triangle (an offender, a target, and a place) with the main concepts of RAT’s Basic Crime Triangle (a likely offender, a suitable target, the absence of a capable guardian or handlers/controllers against crime), thus creating a sophisticated model of crime analysis which has been called the Problem Analysis Triangle (PAT). The major elements of PAT are represented in the following diagram:

GRAPH 5: THE PROBLEM ANALYSIS TRIANGLE (PAT)



SOURCE: www.crimereduction.homeoffice.gov.uk

The Problem Analysis Triangle (PAT) contains six elements that assist crime analysts and experts in investigating how crime occurs, and how it can be prevented.

The inner elements of the PAT diagram are considered the factors of crime events. These include a likely offender, suitable target, and place. Both concepts of a likely offender and a suitable target were defined earlier by the Routine Activity Theory (see Cohen and Felson, 1979). However, the concept of place is suggested by John Eck (1997) as *“a very small area reserved for a narrow range of functions, often controlled by a single owner, and separated from the surrounding area...examples of places include stores, homes, apartment buildings, street corners, subway stations, and airports”* (John Eck, 1997:7-1).

The outside elements of PAT are:

(1) **A handler.** Someone who knows the likely offender well, and is able to discourage him or her from perpetrating a criminal act. Usually, a handler is anyone who is in a position to supervise the potential offender. Examples of normal handlers are parents, siblings, close relatives, friends, peers, teachers, coaches, and spouses. In addition, probation or parole authorities can be handlers (Clarke and Eck, 2003; [.popcenter.](#)).

(2) **A capable guardian.** According to the PAT, a capable guardian can be any person (not security devices) who can protect their own belongings or any potential target of crime. Examples of capable guardians are: ordinary citizens, parents, friends, co-

workers, private security and police authorities (Braga, 2008; Eck and Clarke, 2003).

(3) **A place manager.** Someone who protects a place or location from crime by having some responsibility for regulating its access as well as controlling behaviors of people in the place. Examples of place managers are property owners, managers of bars and drinking establishments, managers of apartment buildings, school drivers, secretaries, teachers in school, flight attendants, landlords in rental places, janitors, motel clerks, parking lot attendants, and recreation and park workers (Braga, 2008; Eck and Clarke, 2003).

Eck and Clarke, 2003, posit that for a crime to occur “*all inner elements of the triangle must be present and all outer elements weak or absent*” (Eck and Clarke, 2003:8). In this manner, PAT is a powerful analytical tool with a theory for crime problems that helps to understand the dynamics of crime and the relationship among places, targets, controllers, offenders, as well as the tools that are used to facilitate crime or to prevent it from occurring, as suggested by Eck ([.popcenter.](#)).

The focus on the tools used by offenders to commit criminal acts, as well as by handlers and victims to prevent crime, has become an important part of

crime analysis. Offenders may use guns, cars, or any other tool to escape from handlers, guardians, and place managers. On the other hand, guardians may use lighting to increase surveillance, and other devices to mark property in order to protect victims/targets against potential offenders. In addition, place managers may use barriers and signs to control behavior of individuals using the place. The idea of tools to facilitate or prevent against crime is added to PAT and helps crime analysts and experts to think about crime prevention responses as depicted in the following figure:

GRAPH 6: THE PROBLEM ANALYSIS TRIANGLE AND ITS TOOLS



SOURCE: www.popcenter.org/learning/pam/help/theory.cfm

Based on the PAT, problems occur when offenders are in the same places as their targets, without any effective controller present. If one or more controller is present however, the chances of crimes occurring are greatly reduced. As a result, PAT helps criminal justice practitioners, crime analysts, and criminologists understand that the presence of attractive targets, weak handlers, ineffective

guardianship, and indifferent management is not randomly distributed across places. According to Eck:

...“offenders do not walk aimlessly across the landscape. Like everyone else, offenders have routine behaviors that take them away from handlers and lead them to discover places with attractive targets. Potential victims also follow routines that separate them from effective guardians in places with weak management. The spatial ordering of crime opportunities and the routines of offenders and victims creates many of the crime problems” (Eck, J., in [.popcenter.org/learning/pam/help/theory](http://popcenter.org/learning/pam/help/theory).)

In sum, one of the major contributions of the Routine Activity Theory to criminal justice policies is to show that although crime prevention responses are crime specific, there are often several responses for a crime problem, depending on which side of the PAT the crime analysis is focused.

4.6.2. THE RATIONAL CHOICE PERSPECTIVE

The Rational Choice Perspective, as developed by Clarke and Cornish (1995, 1996), originated “*from the need to assist situational prevention*” (Felson and Clarke, 1993), which is aimed at changing offender’s judgments of opportunities for crime by environmental interventions (Braga, 2008). Thus, it deals essentially with criminal decision making, and how this is influenced by the offender’s perceptions of risk, effort and rewards (Clarke *et al.*, 1997).

Clarke and Cornish’s (1995, 1996) Rational Choice Model differs from the rational choice approach formulated by economists, which introduces formal

mathematical modeling of criminal choices through which individuals choose “being criminals” as an “occupational option” based on a careful calculation of costs and benefits of their criminal act, mainly in terms of material rewards (Clarke and Felson, 1993).

Contrary to the economist’s image of rational offenders, the Rational Choice Perspective assumes that “crime is purposive behavior designed to meet offender’s commonplace needs for such things as money, status, sex, and excitement, and that meeting these needs involves the making of (sometimes quite rudimentary) decisions and choices, constrained as these are by limits of time and ability and the availability of relevant information” (Clarke and Felson, 1993:6). Thus, criminal decision-making involves a “limited” rational process that fits *“the opportunistic, ill-considered and even reckless nature of much crime”* requiring a crime-specific focus and a body of significant information that varies among offenses, and is influenced by situational contingencies (Clarke and Felson, 1993).

The core of the Rational Choice Perspective is that motivated offenders seek opportunities for committing crime based on their judgments about costs and benefits (though they are not always fully aware of the situation, and often lack complete information, as recognized by Cornish and Clarke, 1986). The underlying idea is that *“opportunity makes the thief”*, thus causing the Rational Choice Perspective, together with the related Routine Activity approach, to fit into the “opportunity theories” category (Clarke *et al.*, 1997). Thus, both theories

share a set of interdependent propositions about criminal action, as defined by Felson and Clarke, 1989,

1. "Each individual makes choices in committing crime.
2. These choices may be influenced by an individual's heredity and background, but are the direct outcomes of a perceived opportunity and a (frequently crude) situational calculus of the costs and benefits of committing the crime.
3. Nobody is exempt from the temptation to commit crime, since human weaknesses are widespread and not confined to any one segment of the population.
4. In weighing the costs of crime, the individual pays far more attention to the risk of being caught than to the severity of punishment.
5. Blame and punishment, though often necessary, are inefficient methods for guiding people towards non-criminal choices.
6. It is easier for policy to affect the situational inducements to commit crime than to combat fundamental human weakness.
7. Easy opportunities will create more crime and reduced opportunities will lead to less crime" (Felson and Clarke, 1989.)

The opportunity theories, which focus on opportunities and situational factors of crime, diverge from traditional criminological theories, which seek to provide general explanations of crime. The latter establish a causal association between psychological and social attributes of individuals and crime, granting little importance "*to the specific forms of crime committed, which are seen to be largely a matter of chance*" (Clarke and Felson, 1993:6).

The opportunity theories of Rational Choice and Routine Activity highlight the differences between the criminal event (or crime) and criminal involvement (or criminality), an assertion traditional criminology is not concerned with. Despite that, they differ from one another by the relevance they lend to those concepts. The Routine Activity is a medium level theory that focuses exclusively on crime

itself, while establishing a causal link between changes in patterns of routine activity leveling the population. This increases opportunities for crimes to be committed, and for changes in crime rates. Rational Choice is a theory of crime and criminality that explicitly highlights the concept of rationality, focusing on the decision models of rational choice at the micro, individual level (Clarke and Felson, 1993).

According to the Rational Choice Perspective (Clarke and Felson, 1993), the criminal event involves a shorter decision-making process with focus on the commission of a specific crime. The criminal event in this case requires a body of relevant and “circumscribed information”, and it is influenced by “immediate”, “near circumstances” and “situational contingences”.

The Rational Choice Perspective views the decision to commit a crime as a multi-stage process. It posits that “*criminal involvement refers to the process through which individuals choose to become initially involved in particular forms of crime, to continue, and to desist*” (Clarke and Felson, 1993:6). The Rational Choice Perspective thus focuses on distal conditions relating to crime involvement decisions (see Clarke, 1995). The decisions taken at each of these stages of criminal involvement are influenced by a variety of factors that need to be examined separately. Understanding the distinctions among these stages, as well as the relevance of situational aspects, permits new insights for crime prevention, particularly for situational crime prevention (Braga, 2008).

The Rational Choice Perspective is essentially oriented to inform crime prevention policies. It has demonstrated from its inception that “*offenders can be deterred by changing their perceptions of risk, efforts and rewards through environmental interventions to reduce crime opportunities*” (Newman *et al.*, 1997: vii).

In addition, the Rational Choice Perspective provides the theoretical framework for the development of a Script Analytic approach (Cornish, 1994), whose main idea is to show that any type of crime requires “*a particular set of standard actions to be performed in a particular order like a script in a play*” (Clarke and Eck, 2003 in Braga, 2008:35), through its emphasis on the person - situation interaction in explanations of criminal events (Cornish, 1994). Such an approach emphasizes how interviews with offenders can be of value to research strategy in collecting information on the nature of criminal acts. As argued by Braga, 2008, “*the use of crime scripts can assist crime prevention designers in focusing their prevention efforts at different points in the series of actions that make up a crime*” (Braga, 2008:35).

One of the Rational Choice Perspective’s major contributions to criminology is that it shows the importance of physical and social characteristics of places in shaping the offender’s decision to commit crime in certain places, while other places remain crime-free. According to this Rational Choice, situational factors that define places, such as poor lighting, untrimmed bushes, abandoned buildings, easy accessibility, lack of imposed surveillance or easy

visibility, and weak management (informal social control) all blend to create opportunities for crimes to be committed, and are significant variables explaining how and why specific locations are repeatedly sites where crime occurs.

The Rational Choice Perspective helps criminal justice practitioners, crime analysts, and policy makers examine the link between situational factors and opportunities for crime, bringing these experts to design more effective, accurate and practical crime prevention measures. These measures, in turn, cause offenders to rethink their' perceptions of risk, effort and reward, and consequently, fewer crimes are committed. The Rational Choice Perspective, therefore, is directly related to the Crime Pattern Theory which focuses on the physical and social characteristics of crime sites, as well as the Situational Crime Prevention approach which is aimed at reducing and preventing crime through interventions on environment and management mechanisms in specific places. The theoretical approaches of these two theories are discussed below, along with their main contributions to contemporary criminology and crime prevention responses.

4.6.3. THE CRIME PATTERN THEORY

The Crime Pattern Theory, also known as the Environmental Criminology Theory, combines Rational Choice and Routine Activity approaches to explore the relevance of place on the geographical and temporal patterns of crime (Eck

and Weisburd, 1995). The primary objective of the purveyors of this theory is to explain how and why crime occurs in specific locations, and to thereby determine whether crime occurrence can be predicted (Brantingham and Brantingham, 1981). This section introduces and discusses the main contributions of the Crime Pattern Theory in advancing a scientific understanding of the nature of crime in specific places, and its implications for crime prevention policies.

As previously discussed, the Environmental Perspective emerged in the nineteenth century with pioneering scientific research findings regarding crime patterns which showed that (a) crime rates vary between different locations; (b) crimes can be measured according to different demographic criteria, e.g., national, regional, provincial and city levels, as well as at the level of smaller areas within cities; (c) crime patterns persist in specific locations over time; (d) spatial collection of crime data can be compared with spatial collection of data on features of inhabitants of places; (e) areas with the highest rates of reported crime are also areas with the highest proportions of offenders' residences and the highest ratio of socio-economic problems, for example, high population density, poverty, and illiteracy; and (f) the location of areas with concentrations of offender's residences and high crime rates strongly correlate to locations with suitable targets, potential victims and conditions that allow an offender easy escape following the commission of a crime (Brantingham and Brantingham, 1976:12).

The Crime Pattern Theory studies crimes as “discrete events.” Its main objective is to understand crime instead of criminality. Based on the assumption that some people are criminally motivated, the Crime Pattern Theory explores crime locations rather than the origins of individual criminal motivation. The impetus of it is to show that “*criminal events can be understood in the context of people’s normal movement through normal settings in the course of everyday life*” (Brantingham and Brantingham, 1981:2).

The Crime Pattern Theory investigates the significance of physical and social characteristics of locations where opportunities exist for crime to flourish, even as people go about conducting their everyday activities. These circumstances bring offenders and victims together at specific settings and time, and motivated offenders perceive signs and cues in the environment surrounding them to locate and identify targets or victims (Brantingham and Brantingham, 1981).

A major contribution of the Crime Pattern Theory to contemporary studies of crime, as well as to crime prevention policies, was to introduce a focus on concentrations or clusters of crimes in actual places, or hot spots. To environmental criminologists, crime events are highly concentrated in discrete addresses or small areas, as well as on particular people, products, and risky facilities (Clarke and Eck, 2005). The idea that most crimes are concentrated in small areas was also shown by Spelman (1995), whose research indicated that

10% of places in a city were likely to account for 60% of all calls for police service (Brantingham and Brantingham, 1997).

Another important contribution of the Crime Pattern Theory is to demonstrate how environmental conditions, (e.g., physical, social, legal, cultural, economic, and temporal elements), and every day routines of vulnerable victims and motivated offenders shaped by “*mobility and awareness factors*” enhance the probability of hot spots emerging in certain places and not others (Brantingham and Brantingham, 1997). The formation of a crime hot spot is not accidental; it is the result of interaction between a potential offender’s motivation and the surrounding environment or situational characteristics of places (Brantingham and Brantingham, 1997). The Brantinghams (1997) introduce two main concepts to help understand how the intersection of different movement patterns of victims and offenders at any particular location increases the criminal potential of that location, as follows:

- (1) **Crime generators**. These are specific places to which large numbers of people are attracted for reasons unrelated to crime. However, in these places there are some people with criminal intent who see favorable opportunities to commit crime. Examples of crime generators are shopping malls, entertainment districts, large housing projects, sport stadiums, large schools, and parks. Thus,

crime generators can provide opportunities for offenders and targets to converge at the same time and place.

(2) **Crime attractors** are places that create opportunities for motivated offenders to commit a crime, and they are therefore attracted to such locales. Examples of crime attractors are drug markets and prostitution areas, large parking lots in business or commercial areas with limited surveillance, and shopping malls, particularly those located near major public transit exchanges.

Advancing Brantingham and Brantingham's concept of crime generators and crime attractors, Clarke and Eck, 2005, introduced the concept of crime enablers, a third causal mechanism for understanding the formation of hot spots. Crime enablers occur when there is little regulation of behavior in places, as a result of the removal or change in place management, as well as with the erosion of guardianship and handling (Clarke and Eck, 2005). Thus, the absence of a parking lot attendant can create opportunity for loitering and auto theft, and certain parenting styles can contribute to increased risk in the victimization of children.

Environmental criminologists showed that *"offenders commit their offenses near the places where they spend most of their time – home, work, school, shopping, entertainment – and along the major pathways between them."*

Similarly, victims are victimized near places where they spend most of their time and along the major pathways in between" (Brantingham and Brantingham, 1981:2). They develop an awareness of their immediate environment and commit crimes within areas with which they are familiar (Brantingham and Brantingham, 1994; 1993).

"Normal activities shape crime patterns", the Crime Pattern Theory contends (Brantingham and Brantingham, 1981). This theory asserts that crime can be understood and predicted by looking not only at where offenders live, but where ordinary people, including offenders and their victims, spend most of their time while conducting their everyday activities, such as traveling to and from home, work and school, shopping and recreation. It also advocates that an analytical focus be placed on a city's land use patterns, its streets networks and transportation systems (Brantingham and Brantingham, 1981).

In addition, Felson, 2006, also highlights the importance of in-between areas in which criminal acts occur. The interplay between offender settings and conventional settings and their proximity is important. Poorly lit paths between them can facilitate crime. Furthermore, as Braga (2008) argues:

"Studies of environmental factors of crime have shown that commercial properties located near main roads have an increased risk of robbery, and affluent homes located adjacent to poorer areas are more likely to be burglarized. In both cases, the offenders' "journey to work" was greatly reduced by the proximity of the targeted places to the offenders' homes or to a major thoroughfare. A key insight from these studies was that the offender's target search time, the amount of effort expended by the offender to locate a suitable target, was related to risk of victimization at that place (as described by Clarke, 1995)" (Braga, 2008:35).

The Crime Pattern Theory also shows that *“location of crimes is determined through structured search and decision process on the part of offenders (and victims) shaped by perceptions of environmental cues that separate good criminal opportunities from bad criminal risks”* (Brantingham and Brantingham, 1981).

According to Felson’s arguments in Environmental Criminology in *Crime and Nature* (2006), *“every setting of daily life emits cues about itself”*, however some settings produce “an excess of criminogenic cues” such as the existence of “good targets”, “the absence of guardians against crime”, or “easy access and egress”, over cues “unfavorable to crime”, for example, the presence of efficient place managers, handlers, and guardians of targets. Some settings send out cues that are “irrelevant to crime;” others “say to potential offenders” “to avoid crime here”; while others “tell potential offenders to proceed with a crime.” Environmental cues and signals might “stimulate diverse types of crime,” while others might evoke “specialized crimes”, for example, *“a cash register is suitable for theft or robbery, a store’s floor is best for shoplifting, and the storeroom entices employee theft. A cavernous commercial area invites all three”* (Felson, 2006:97).

Felson, 2006, introduced a new concept for discussing the spatial distribution of crime - *crime habitat*, an area that provides the “basic needs” for a specific type of crime to “grow”, “live” and “reproduce.” He argues here that crime

is not homogeneously distributed over its natural *habitat*, rather, it grows in a certain place according to the social and physical features of that place. As a result, the environmental features of places “invite” the occurrence of crime and “define” its own *habitat*. Felson (2006) identifies the following categories of crime habitat:

1. **Specific crime habitats.** A specific crime habitat that allows one type of crime to recur in a certain area. An example of this is the shopping mall, characterized by wide exits from each store, thereby appealing to shoplifters. Another example is the preponderance of alleys behind Chicago-area houses, which encourage residential burglaries.

2. **Generic crime habitats.** A generic crime habitat encourages many different types of crime at a high rate in a noticeable area. Felson defines three types of generic crime habitat:

- a. **Discrete edges:** Brantingham and Brantingham (1981) designated the zone between two communities or neighborhoods as the edge. The key to this concept is that certain features on the edges between two communities, such as stores, parks, parking

lots, and other amenities, attract victims as well as offenders from both sides. Offenders can go there to conduct lawful activities, but they can also go to these discrete edges to commit criminal acts, then leave with impunity, having easily gotten away with a crime.

b. **Connected edges:** Edges interconnected by a motorized transport system encourage crime because they allow offenders to travel more freely along the edges. *“Modern connectivity helps offenders and victims to range farther, allows illegal markets to serve a wider area, and for crime to spread in new ways”* (Felson, 2006:117).

c. **Thick crime habitats:** The interconnection of abandoned sites, properties and nearby edges creates thick crime habitats – “an expanse of unsupervised spaces” - where offenders can move about more freely, on foot or otherwise, to commit criminal acts with impunity then “return to home ground with the loot” (Felson, 2006:118). Thick crime habitats also make it possible for criminal activity to become virulent and, in its more extreme form, to become *attached* to particular settings, *colonize* nearby areas, and *poison* conventional activities and the physical structures on which they rely (see Felson, 2006:121). As argued by Braga (2008), “*in*

thick crime habitats, crime is dominant and legitimate business and community life has noticeably declined' (Braga, 2008:38).

The new concepts focusing on the nature of crime have contributed not only to furthering the importance of the Crime Pattern Theory, but also to expanding crime prevention policies. These policies aim to improve situational crime prevention measures by changing the characteristics of settings that allow crimes to be committed more easily. Practitioners working in this field have also tried to frame a more comprehensive rational choice model of criminal offense, as posited by Cornish and Clarke (1986).

According to Brantingham and Brantingham, 1981, environmental criminology's findings have been supported by many empirical studies which have demonstrated that:

- a) "Where robbers and burglars live and work strongly influences where they commit their offenses" (Gabor, et al., 1987; Rengert and Wasilchick, 1985; Maguire, 1982).
- b) "Offenders who live close to one another tend to travel in the same direction to the sites where they commit offenses, but crime sites tend to attract offenders from many different directions" (Costanzo, Halperin and Gale, 1986).
- c) "The types of activities people pursue outside of working hours strongly affect the rates and types of criminal victimizations they suffer" (Kennedy and Forde, 1990).
- d) "Types of land use such as fast food restaurants, (Brantingham and Brantingham, 1981), bars (Roncek and Pravatiner, 1989) or high schools (Roncek and Lobosco, 1983) are criminogenic because of the volume of people they attract and, sometimes, because of the nature of their activities, and their juxtaposition with other land uses can affect the crime rates of entire neighborhoods".
- e) "Street networks along with traffic and transit patterns strongly affect the distribution of crimes" (Beavon, 1984).

f) "Crime rates vary quite substantially by land use type (Felson, 1987), and it is now possible to build predictive models of the crime potential of any given point within a city" (Felson, 1986)" (Brantingham and Brantingham, 1981:3)

Despite the progress of the Crime Pattern Theory as it has been applied to criminal justice policies and to the study of Criminology, critics argue that crime prevention strategies focused on eliminating or preventing crime in specific places will simply displace offenders. In other words, offenders may be dissuaded from committing crimes in one area, but will flock to other geographical locations at other times, using different tactics, and choosing different targets, and even committing different crimes (see Chaiken *et al.*, 1974; Mayhew *et al.*, 1980; Press, 1971).

Empirical researchers have found, however, that crime does not displace these criminals as often as critics have believed (Braga, 2008; Felson, 2006; Clarke and Eck, 2005; Brantingham and Brantingham, 1997, 2003; Eck, 2002). As Clarke and Eck (2005) argue:

"Offenders can find it difficult to move to some other location because easy crime or disorder opportunities are limited...Targets may be concentrated at some places and not others...Vulnerable potential victims can be found at some locations, but not others...Some facilities have low behavioral controls, but others do not...Opportunities that exist are either already hot spots or are hidden from offenders – either far away or not recognizable as fruitful places to offend" (Clarke and Eck, 2005:48).

Researchers have demonstrated that, rather than forcing crime to move to other areas, opportunity-reduction measures based on Environmental

Criminology principles have resulted in crime control benefits beyond target areas, reducing crime more extensively than expected – a phenomenon referred to as diffusion of benefits (Clarke and Weisburd, 1994).

To sum up, the Crime Pattern Theory has been applied to gain understanding of the mobility patterns of victims and offenders. Pioneer studies of mobility patterns of homicides (Bullock, 1955; Pokorny, 1965) have found that homicides occur within relatively short distances between victims' and offenders' residences. In addition, a recent study conducted by Pizarro *et al.*, 2007, shows that the mobility patterns of offenders vary by type of homicide motive. They are also influenced by the socio-economic characteristics and lifestyles of the victims and offenders (Pizarro *et al.*, 2007:391). However, despite the contributions of the Crime Pattern Theory in explaining varying circumstances related to homicides, there is still very little empirical research on how environmental factors are relevant to the risk of homicides in specific places.

4.6.4. SITUATIONAL CRIME PREVENTION

The Situational Crime Prevention Approach was developed in the 1970s by Ronald V. Clarke at the British Home Office Research Unit. It draws upon new theories of crime such as the Routine Activity theory, the Rational Choice theory, and the Crime Pattern Theory (Clarke and Cornish, 2003; Clarke and Felson, 1993; Brantingham and Brantingham, 1993) in order to develop more effective

crime prevention strategies through the use of crime-specific opportunity reduction measures (Cornish and Clarke, 2003).

The Situational Crime Prevention Approach shares with other recent theories on crime the common idea that all individuals are capable of committing a crime, and thus, “opportunity makes the thief” (Clarke and Felson, 1998). It has become an important component of official crime prevention policies in European Countries, such as Sweden, Holland, as well as Australia and the United States (see Clarke and Felson, 1997). According to Clarke and Felson, 1997,

“The crime prevention approach “is focused on the immediate environments in which crimes occur, rather than upon those committing criminal acts. It seeks to forestall the occurrence of crime, rather than to detect and sanction offenders. It seeks not to eliminate criminal or delinquent tendencies, but merely to reduce opportunities for crime by better designing and managing places where people interact with each other, and human activities are located (see Felson and Peiser, 1998). Central to this enterprise is not the criminal justice system, but a host of public and private organizations and agencies – schools, hospitals, transport systems, shops and malls, manufacturing businesses and phone companies, banks and insurance companies, local parks and entertainment facilities, pubs and parking lots – whose services, products and modes of operation spawn opportunities for a vast range of different crimes” (Clarke and Felson, 1997:197).

The Situational Crime Prevention Approach uses scientific methods to provide a practical and effective model of crime control consisting of “opportunity-reducing measures that are (1) directed at highly specific forms of crime (2) involve the management, design, or manipulation of the immediate environment in as systematic and permanent a way as possible (3), so as to increase the effort and risks of crime and reduce the rewards as perceived by a wide range of

offenders” (Clarke, 1992:4). Thus, situational crime prevention makes “*criminal action more difficult and risk, less rewarding and less excusable*” (Clarke and Felson, 1997:197).

Examples of situational crime prevention measures by Clarke, 1995, are: surveillance cameras for subway systems and parking facilities; defensible space architecture in public housing; making potential targets such as apartment blocks and individual residences more difficult to access; electronic access for cars and telephone systems; street closures and traffic schemes for residential neighborhoods; alcohol control measures at festivals and sporting events; training in conflict management for public safety officers and bouncers; and improved inventory taking procedures in warehouse and retail outlets.

A micro analysis of the process of crime commission itself was developed in the Situational Crime Prevention Model, with special attention to the importance of existing opportunities which enable crimes to occur (Cornish and Clarke, 2003). The model emphasizes the significance each situation presents in providing opportunities and situational cues for offenders to accomplish their criminal goals.

A study conducted by Professor Marcus Felson and his colleagues in New York City’s Port Authority Bus Terminal provides a useful example of the way in which situational crime prevention measures can be applied to reduce opportunities for crime. The study shows how detailed modifications in the

physical design of the bus station discourage diverse types of crime such as robbery, pickpocketing, luggage theft, larceny and assault (Felson *et al.*, 1996).

Another good example is provided by Ronald Clarke, 1995, whose work shows the positive effects that closing streets and alleys in residential areas have on reducing a variety of crimes. In addition, an evaluation of alley-gating to reduce opportunity for burglaries was conducted by Bowers *et al.*, (2004) in a residential area in Liverpool, UK. This study showed that not only was burglary reduced by approximately 37%, properties in the surrounding areas also benefited.

The Situational Crime Prevention Model shows that direct and proximal determinants of a crime problem are seen as the primary agents in crime causation rather than “distal” or indirect factors (Newman, 1997:4). The distinction between “distal” and “proximal” situations was introduced by Paul Ekblom, 1994. Examples of distal situations include social, family, and individual background factors while proximal situations include detailed elements of the situation in which a specific crime occurs. As an example, Clarke and Eck, 2005, point to irresponsible liquor serving practices that promote drunkenness in local bars and taverns, and the immediate availability of bottles and glasses that can easily be used as deadly weapons.

Because of its emphasis on the immediate situation of a crime, the Situational Crime Prevention Approach gives little meaning to the general and broad definition of “crime.” Instead, it provides an accurate explanation of specific

categories of crime, based on a detailed description of its attributes. As a result, *“a burglary is not simply a burglary, rather it is a situation in which houses constructed in a particular way, situated in a particular kind of neighborhood, are entered at a particular time of day, and have particular items stolen. No two burglaries are the same, unless they fit these same very specific patterns”* (Newman, 1997:9).

Such attention to minute detail in defining categories of crime makes situational crime prevention valuable in explaining the causes of specific crime events, and consequently in driving more effective crime prevention strategies that seek to intervene in “proximal” situations that create opportunities for particular offenses to be committed.

Evaluative studies on the effectiveness of situational crime prevention with the goal of reducing specific crimes (Clarke, 1993) has allowed for the development of situational techniques or preventive measures aimed at “increasing the effort of crime”, “increasing the risks”, and “reducing the rewards”. Clarke (1993) originally presented 12 techniques to prevent street and predatory crimes. Clarke and Homes (1997) added four techniques to the original 12, “removing the excuses for crime”. Cornish and Clarke (2003) introduced the latest advance in situational crime prevention techniques, expanding them to 25, including the category of “reducing provocations for crime,” shown as follows:

TABLE 4: TWENTY-FIVE SITUATIONAL CRIME PREVENTION TECHNIQUES	
INCREASE THE EFFORT	<ol style="list-style-type: none"> 1. Make Target Harder 2. Control Access to Facilities 3. Screen Exits 4. Deflect Offenders 5. Control Tools/Weapons
INCREASE THE RISKS	<ol style="list-style-type: none"> 6. Extend Guardianship 7. Assist Natural Surveillance 8. Reduce Anonymity 9. Use Place Managers 10. Strengthen Formal Surveillance
REDUCE THE REWARDS	<ol style="list-style-type: none"> 11. Conceal Targets 12. Remove Targets 13. Identify Property 14. Disrupt Markets 15. Deny Benefits
REDUCE PROVOCATIONS	<ol style="list-style-type: none"> 16. Reduce Frustrations and Stress 17. Avoid Disputes 18. Reduce Arousal and Temptation 19. Neutralize Peer Pressure 20. Discourage Imitation
REMOVE EXCUSES	<ol style="list-style-type: none"> 21. Set Rules 22. Post Instructions 23. Alert Conscience 24. Assist Compliance 25. Control Drugs and Alcohol

SOURCE: Clarke and Eck, 2005, *Crime Analysis for Problem Solvers in 60 Small Steps*

Most situational crime prevention techniques shift the responsibility for prevention of specific crimes from traditional crime control mechanisms such as the police and others in the criminal justice system to those individuals (a motivated offender) or organizations – who, whether near or distant, are somehow involved with the crime situation (Felson and Clarke, 1997). As Newman argues,

“Once again, it should be understood that situational crime prevention does not so much remove the individual’s responsibility for the offence, but spreads responsibility to other citizens, including potential victims, to take precautions against crime. The police and the criminal justice system are simply not in a position to take the necessary action. Furthermore, the impetus for making others besides the police and perpetrators take responsibility for crime prevention may lie with non-governmental agencies, such as insurance companies who traditionally deal with risk” (Newman, 1997:18).

Despite the efforts by practitioners to use situational crime prevention to eliminate or reduce the opportunities for motivated offenders to commit crimes, these efforts are often criticized for simply shifting criminal activity from one location to another, to other targets and even to other types of crime (Clarke and Felson, 1997). Moreover, many opportunity-reducing measures, which include intensified surveillance of public space and other intrusions on everyday life, are perceived as threats to civil liberties, resulting in a “fortress society” (Newman *et al.*, 1997: vii).

However, in response to such criticism, studies of situational crime prevention initiatives (Braga *et al.*, 1999; Sherman and Rogan, 1995b; Hesseling, 1994; Press, 1971) have shown no significant evidence of crime displacement. For example, Hesseling’s study, 1994, concluded that of 55 situational crime prevention projects undertaken for the Dutch Ministry of Justice, 22 projects presented no evidence of displacement, while displacement in the 33 remaining projects was minor, or statistically insignificant.

Though Clarke and Cornish (1987) recognize that offenders are most likely to move when other crime targets share the same choice-structuring

properties as the original crime opportunity structure, Clarke (1995) argues that “the easy and/or profitable criminal opportunities of the targeted offenses may not be available elsewhere. Moreover, the level of displacement may be dependent on the offender’s familiarity with alternative tactics, places, times, and targets” (Clarke, 1995 in Braga, 2002:50).

Clarke and Weisburd, 1994, show that rather than causing displacement, situational measures can produce unexpected benefits and reduce crime risks beyond the immediate areas or targets protected. This is referred to as “diffusion of benefits” and it “*seems to result when offenders are unsure of the scope of new measures and believe that the risks or effort involved in crime have been increased more generally than they really have*” (Clarke and Felson, 1997:202).

Although the benefits of situational measures for crime prevention are apparent, the application of such measures to control the complex crime of homicide is still a new idea, and is especially difficult to assert within the context of violent favelas. The challenge of the current research is to combine the Situational Crime Prevention approach with the Routine Activity Theory, Rational Choice Perspective and Crime Pattern Theory in order not only to theoretically frame the main research hypotheses on one of the biggest problems facing Brazil, namely violence among poor male young adults and adolescents who live in favelas, but also to provide new insights to complement traditional crime prevention responses to homicide.

OVERVIEW

Chapter 4 is a review of the existing criminological literature focused on environmental factors and crime. The chapter begins with an introduction of prior studies on the spatial distribution of crime in modern criminology in the 19th century, and proceeds to describe its evolution from macro to micro-analysis of crime in places that lack effective monitoring. The chapter then elaborates on the new crime theories that emerged in the middle of the 20th century. The objective is to review the main principles and concepts of these theories in order to show hypotheses, and to describe the research method of the current study.

PART 3

RESEARCH DESIGN AND FINDINGS

CHAPTER 5

RESEARCH DESIGN: AN INTRODUCTION

This chapter is an introduction to the research design. It starts with a brief description of the main research questions and hypotheses. Next, it describes the two parts of the research design: the exploratory spatial analysis of homicides in the favela and the matched case control-study.

5.1. RESEARCH QUESTIONS AND HYPOTHESES

The research design is aimed at exploring the role situational factors play when offenders choose to commit murder in certain specific places and not in others, in the diverse and volatile environment of the Alto Vera Cruz favela.

It is based on the underlying principles of Environmental Criminology that *opportunity makes the thief*. As discussed in chapter 4, Environmental Criminology assumes that immediate situational factors have a central role in creating opportunities for people to commit crime and get away with it at very specific locations, or prevent them from doing so. Although these factors might have only a minor role in explaining a complex predatory crime such as homicide, an act that is conventionally perceived as emotionally driven and irrational, the investigation of such factors might help to explain how and why killings tend to occur in certain places in the favela where the risks of offenders

being caught seem to be generally low. This idea constitutes the core of this current research design that seeks to answer the following research questions:

- In violence-ridden favelas, why do homicides occur in certain places and not others?
- Do situational factors help explain the spatial distribution of homicides within violent favelas?
- Are there specific situational factors at the addresses where homicides occur that are not found at addresses free of homicides?

In order to answer these research questions, two hypotheses are tested as follows:

1. Situational factors at specific addresses reduce the effort for potential killers by facilitating the convergence of motivated offenders and their victims in the same place and at the same time.
2. Situational factors at specific addresses reduce the risks for potential killers by imposing obstacles to surveillance mechanisms and by allowing offenders easier ways to escape.

In this study, situational factors include the alleyways, drug areas, bars, bus stops, stores, public phones, street lighting, and vehicular traffic, as well as the design of residential houses.

5.2. THE TWO PARTS OF THE RESEARCH DESIGN

The research design adopted for this study comprises two parts. One is the exploratory analysis of the spatial distribution of homicides in the favela and the second is the matched case-control study of addresses with and without homicides. A brief description of each of these follows below.

The **exploratory analysis of the spatial distribution of homicides** includes a spatial point pattern technique that is intended to (1) examine the distribution of homicide locations in the favela, (2) investigate whether the concentrations of homicides in specific places is statistically significant, and (3) assess possible interactions between homicide locations and situational factors. It also addresses the spatial autocorrelation component of homicide locations, which asserts that there is often a greater relation between for geographical units of observation that are near one another than observations that are distant from one another (Werneck, 2008.) The assessment of the spatial autocorrelation of homicide locations helps to clarify and examine the accuracy of the underlying assumption that situational factors play a relevant role in the occurrence of homicides in certain specific places.

The exploratory spatial analysis includes two independent variables within the two geo-referenced data – drug areas and alleys. This allows the investigation of possible interactions between geographical patterns of homicides and spatial patterns of the two geo-referenced situational variables. These variables are considered favorable factors for the killings in the favela from the point of view of the police and murderers: while drug areas facilitate the convergence of murderers and their victims, alleys facilitate the escape of offenders and their subsequent disappearance into less accessible areas of the favela which are rarely reached by the police.

The second part of the research design is **the matched case-control study** which allows a comparison of similarities and differences between homicide addresses and addresses free of homicides. In the matched case-control study each observed case is matched with an individual control case, making them more comparable and the experiment stronger.

In sum, the research design, including the exploratory spatial analysis and the matched case-controls study, provides an innovative approach in this study, helping to identify how homicide locations are distributed over the favela, and to assess possible correlations between the locations where homicides are committed and situational factors.

Chapter 6 describes the exploratory spatial analysis of homicide events and Chapter 7 discusses the matched case-control study and its findings.

CHAPTER 6

EXPLORING THE SPATIAL DISTRIBUTION OF HOMICIDES IN THE ALTO VERA CRUZ FAVELA

This chapter explores the spatial distribution of homicides in the Alto Vera Cruz favela using two methods. First, a point pattern analysis is used to focus on the distribution of homicide locations displayed as point data and indexed by geographic coordinates (latitude and longitude) on the map of the favela. Its main objective is to verify whether the distribution pattern of the homicide locations exhibits complete spatial randomness, regularity or clustering (Bailey and Gatrell, 1995; Werneck, 2008).

The second method that will be used is spatial auto-correlation analysis, which refers to what has been called “the first law of geography” by Waldo Tobler (1970) namely – *everything is related to everything else, but near things are more related than distant things*. Werneck, 2008, contends that according to spatial autocorrelation, characteristics of a variable that are geographically close together tend to have more in common with one another than the characteristics of the same variable that are farther apart from one another. The spatial autocorrelation concept in this study is a key component used to gauge whether the fact that a homicide event occurs at one location in the favela may prevent, or increases the likelihood of, a homicide occurring in a neighboring location. In

order to conduct this analysis the locations of homicides are artificially displayed as aggregate data.

Each of these exploratory analyses of the spatial dimension of homicides in the AVC favela is discussed below.

6.1. POINT PATTERN ANALYSIS OF THE SPATIAL DISTRIBUTION OF HOMICIDES

Point pattern analysis includes a series of techniques for looking at the distribution of homicides in the Alto Vera Cruz favela, consisting of the Kernel function, the Ripley's K -function and the G -function. These techniques are discussed as follows.

6.1.1. THE KERNEL DENSITY FUNCTION: A PRELIMINARY CRIME MAPPING RESOURCE FOR IDENTIFYING HOMICIDE HOT SPOTS

The first crime mapping technique used in this study is the Kernel density function that is computed by using CrimeStat and results exported to MapInfo software for mapping. This technique is applied to homicide data in the Alto Vera Cruz favela between 2000 and 2006, allowing for the identification and visualization of crime hot spots on the map of the favela. The results of this method are shown on the map, "Homicide Hot spots in the AVC favela, 2000-

2006” where the two darkest red spaces indicate two hot spots of homicides, as follows (see appendix 4):

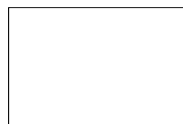
**MAP 1: HOMICIDE HOT SPOTS IN THE AVC FAVELA, BRAZIL
N=100 (2000-2006)**



The Kernel function identifies hot spots according to their geographic locations, and size and shape, as well as their temporal patterns. This method also allows the visualization, through contrast, of bounded spaces with less

incidence of crime, as well as those with no crime. Maps 2 and 3, below (see annex 5), illustrate two hot spots that are located in gang areas: the gang of the Pit Bull Brothers and the gang of the August Papini. Map 4 (see annex 6), in contrast, represents a “cooler” hot spot that is located in the *Cruzeirinho*’s gang area, while Map 5 (see annex 6) indicates a geographical space totally free of homicides in the AVC favela.

MAP 2: HOMICIDE HOT SPOT IN THE PIT BULL



**MAP 3: HOMICIDE HOT SPOT IN THE AUGUSTO
PAPINE'S GANG AREA IN THE AVC FAVELA**



**MAP 4: COOLER HOMICIDE SPOT IN THE
CRUZEIRINHO'S GANG AREA IN THE AVC FAVELA**



**MAP 5: SPOT FREE OF HOMICIDES IN THE
AVC FAVELA**



As illustrated in the maps above, the Kernel function is a valuable tool, providing a descriptive analysis of the spatial distribution of homicide, indicating what locations could become homicide hot spots. However, as Anselin *et al.* state, 2008, this technique can be misleading “since it does not account for spatial variations in population at risk” (Anselin *et al.*, 2008:105). Despite this limitation, the Kernel density function has been a crucial resource for analysts, criminal justice practitioners and policy makers directly involved in formulating, implementing and evaluating crime prevention and control programs. In this study, the Kernel density function not only allows a visualization of the most likely spots where violence may occur in the AVC favela, it also helps to form some hypotheses on the influence situational factors may have on explaining the incidence of homicides at specific addresses.

In order to proceed, this section employs two exploratory spatial statistical techniques using the Splancs statistical software ([://cran.r-project.](http://cran.r-project.org)). The first spatial technique is the Ripley's *K Function* that is used to verify whether the observed homicide hot spots within the AVC favela are more than random occurrences but instead are systematic and predictable events. This is an important criterion for assessing whether the environmental features of hot spot locations truly influence crime. If hot spots are random, they would occur anywhere, and location does not matter. Thus, any crime prevention efforts targeting environmental features would be futile in reducing hot spots as Anselin *et al*, 2008 highlight.

The second spatial technique is the G -function, a technique used to test the hypotheses associating homicide point patterns with two environmental features: drug-trafficking spots and alleys. These techniques are discussed below.

6.1.2. RIPLEY'S K-FUNCTION

The Ripley's (1976) *K*-function is a global test for clustering, and does not provide the exact location of the clusters (Anselin, 2008). It is also referred to as second order proprieties of a point pattern (Anselin *et al*, 2008: 108). According to Anselin *et al*, 2008, the first order proprieties is the average number of observed points per unit area while the *K*-function is a summary statistic used to

investigate the covariance between intensities of observed points at different locations within a study area.

In this study the Ripley's K -function is used to test the hypothesis of Complete Spatial Randomness (CSR) of homicide point patterns in the AVC favela. The CSR model implies lack of interaction between events and the constant intensity of events over the study region. The CSR is compared to the regularity of a spatial point process, where there is an inhibition among the events, which tend to be farther from each other than what would be expected under complete spatial randomness. Within the spatial process for clustering, there is an attraction among various events which tend to occur closer together than what would be expected under complete spatial randomness. In this study, the Ripley's K -function is used to verify whether the spatial pattern of homicide locations within the Alto Vera Cruz favela is random, or whether it falls under the influence of any other events over a wide range of scales.

Under the CSR hypothesis, the Ripley's K -function has an expected value of $K(r)$ (the area of the circle whose radius is r). According to the principle of regularity, fewer events are expected to occur within the distance r of an event chosen at random, than under the CSR process. Therefore $K(r)$ tends to be less than zero. In the same way, in processes which are more clustered, more events are expected within a given distance than under the CSR process, or $K(r) > 0$.

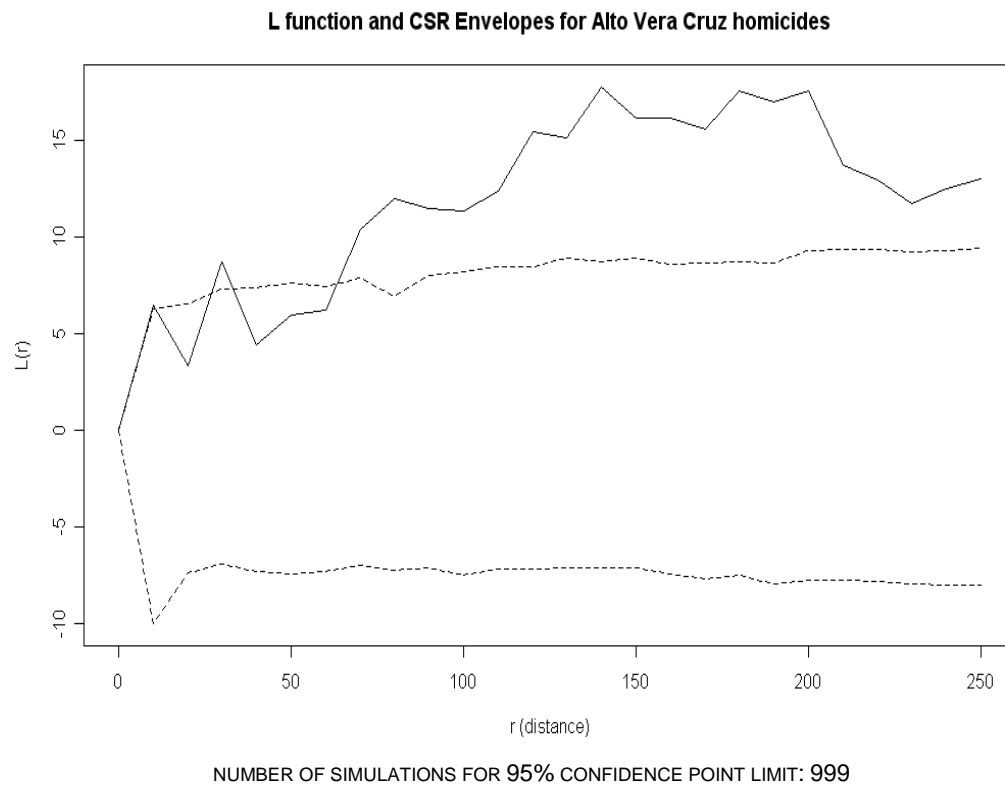
In order to investigate whether the spatial point pattern of 100 homicides in the Alto Vera Cruz favela is random, CSR envelopes were computed from 999

simulations of point patterns under CSR inside the AVC polygon, thus allowing a point-wise comparison of the observed K -function estimator (i.e., comparison for each distance individually). The main goal of envelope calculation is therefore to compute the 95% confidence limit for simulated Ripley's K -function under CSR in the AVC favela.

Since a parabolic shape in the plot of the Ripley's K -function versus distance is expected, the K -function is transformed into the L -function, which is basically the square root of the K -function. The L -function allows the visualization and comparison of the K -function to a straight line at zero.

The L -function is a statistic that summarizes the relationships between events in a point pattern, thus allowing the evaluation of the interactions between points in different scales. The expected value of the L -function is zero, but since it is a random function, this value will never be exactly zero.

The envelopes will indicate how much variation from zero will be allowed. Thus, if the L -function is inside the envelopes, there is no evidence against the hypothesis of lack of interaction among the event locations. In general, $L(r) > 0$ is an evidence of clustering, and $L(r) < 0$ indicates regularity in the spatial distribution pattern of homicides in the favela in question. The results of L -function and CSR envelopes are illustrated by graph 7 below, where the solid lines represent the observed homicide pattern, and the dotted lines represent what should be expected under CSR in the Alto Vera Cruz favela.



As shown in the graph above, the L -function is greater than the upper confidence limit for distances greater than 65 meters among homicide points. This shows that over that distance, the distribution pattern of homicides in the Alto Vera Cruz favela tends to be more clustered than expected in a CSR pattern. Since the envelopes have a 95% confidence, if the homicides in the AVC favela indeed do fall into a CSR pattern, the observed L -function will fall outside the envelopes in 95% of the analyses.

For anything less than 65 meters, on the other hand, there is no interaction among the homicide distribution points, which tend to occur in a random manner.

The result obtained for the L -function supports the results obtained by the Kernel map, which demonstrates the presence of homicide hot spots in the Alto Vera Cruz favela. These spatial analyses techniques are similar, but have different purposes: while the Kernel estimation method shows where the homicide points tend to be located, highlighting their concentration in each part of the map, the L -function shows the relationship between these points: whether they attract, repel or leave one another unaffected. These techniques are complementary, and are crucial to the understanding of spatial distribution patterns of homicides from different perspectives.

6.1.3. THE χ^2 -FUNCTION

The χ^2 -function describes the interactions between the events of two different point patterns observed in the same region simultaneously, and verifies if these two point patterns are independent - in other words, that there is no interaction between events of different types over a wide range of scales.

In this study, the χ^2 -function is used to verify if there is any association, or independence, between the spatial distribution patterns of homicides and drug markets in the same way as between homicide and the presence of alleys.

The hypotheses that the presence of alleys and drug market influence the risk of homicides in certain locations in the favela is based on the perception and

experience of police officers and investigators, as well as murderers involved with drug trafficking. As a detective tells if a policeman sees a guy killing someone, which is very rare, and the murderer escapes into an alley, the policeman will never catch the guy. Alleys are very uneven paths, full of curves, without visibility. The police walk around 20 meters inside an alley and the alley connects with four more alleys. The murder is often a drug dealer, and he knows the alleys. The policeman cannot enter inside an alley because if the criminal is on the opposite side of the alley, at the alley's corner, and the policeman run that direction, the criminal will catch and kill the policeman, If a policeman enters into an alley, he has to be careful, slowly and very carefully, examining each corner. If not, he can be shot to death.

And, as a drug dealer tells, a criminal usually escapes from the police into alleys. He breaks into someone's house, jumping roofs. There are no rules for escape. He gets out on the other side of the alley, in the other part of the favela. If there are thirty houses inside the alley, how can the police go into all of them in order to find the criminal? If it a crook who broke into someone's house, no one is going to say anything, they will not do anything against him.

In addition to alleys, drug areas are another favorable location for homicides in the favela. Although there is a belief that homicides do not occur in drug-trafficking areas because of the negative repercussions violence would have on drug trade by either scaring customers away, or attracting more police activity there are certain evidences that indicate that homicides tend to be

concentrated in drug areas. For example, the police recognize that the division of the favela into various drug trafficking groups and the availability of guns among local individuals involved with illegal activities have a strong effect on violence. For them, part of the violence is caused by the trespassing into drug trafficking areas by rival drug dealers, disputes related to drug debts or drug spots.

The K_{12} function assumes stationarity of the point distribution patterns of the verified events. Thus, the null hypothesis of the λ -function is one of independence between the two point patterns analyzed.

The expected value of the $\lambda(r)$ function is (the area of the circle whose radius is r). The λ -function graph is in the shape of a parabola. In order to verify that there is an attraction between homicide patterns and alleys that tends to occur at closer proximity, or between homicide events and drug spots, the λ -function is changed into the L -function, which allows us to visualize and compare the λ -function to a straight line.

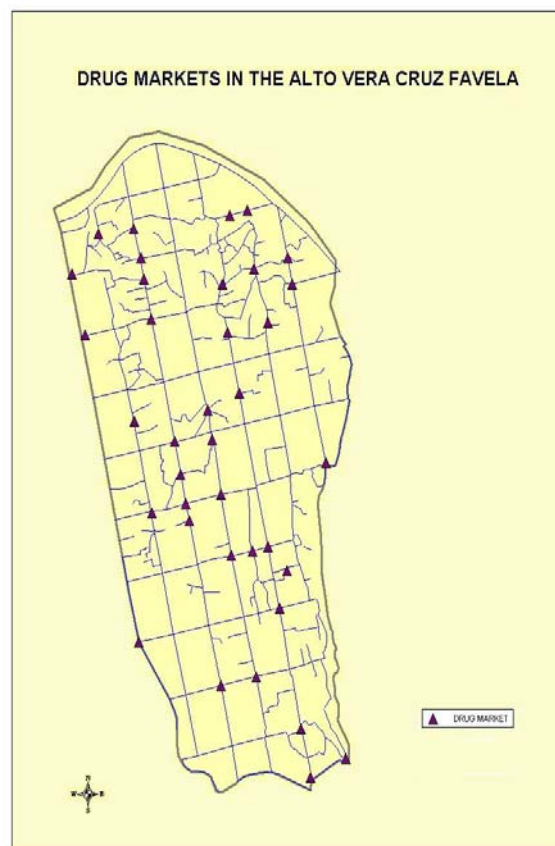
To obtain the λ -function the following formula is used:

$$L_{12}(d) = \frac{\sqrt{k_{12}(d)}}{\pi} - d$$

Similar to the L -function, $\lambda(r) = 0$, indicates independence between the point patterns of these two events. If $\lambda(r) > 0$, it indicates a clustering pattern, and if the $\lambda(r) < 0$, then there is evidence of regularity.

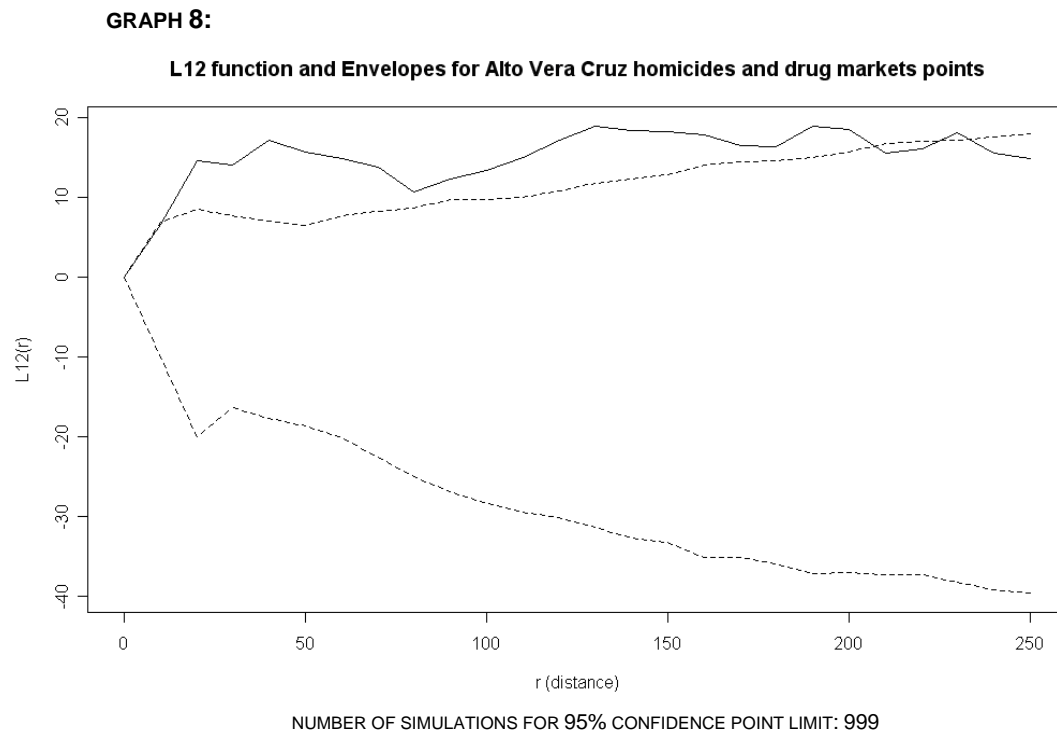
To find the λ -function for the distribution patterns of 100 homicides relative to the drug spots, the addresses of those places, obtained from the Military Police company, were geo-referenced on the map of addresses in the favela, using the MapInfo software. The results are depicted below:

MAP 6: DRUG MARKETS IN THE AVC FAVELA



After geo-referencing the drug market locations and the homicide addresses, the λ -function was calculated, and envelopes were generated to determine the 95% point confidence limit computed from 999 simulations of

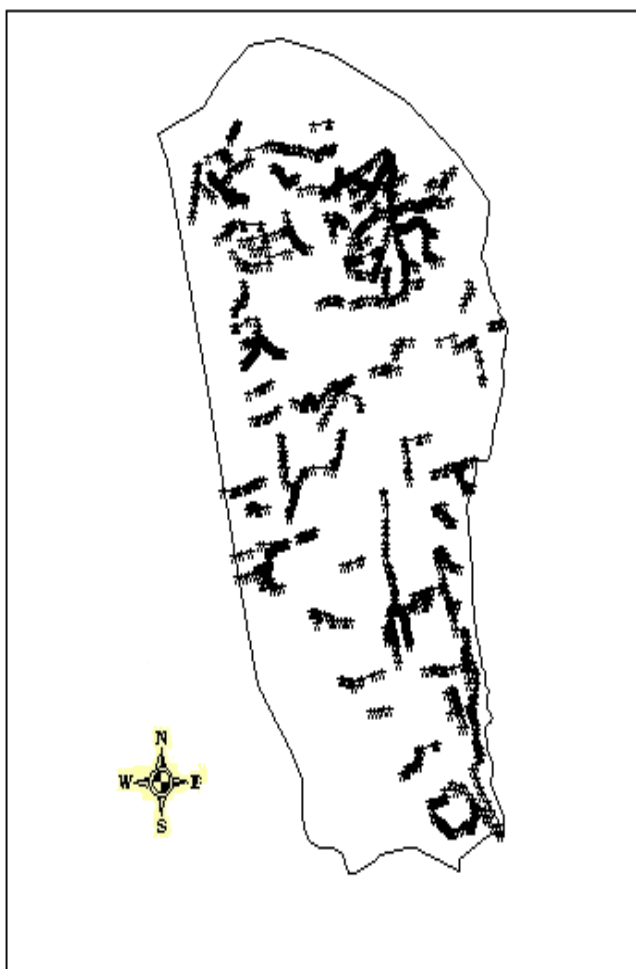
homicide point patterns independent of the drug market locations. As a result the following graph was obtained:



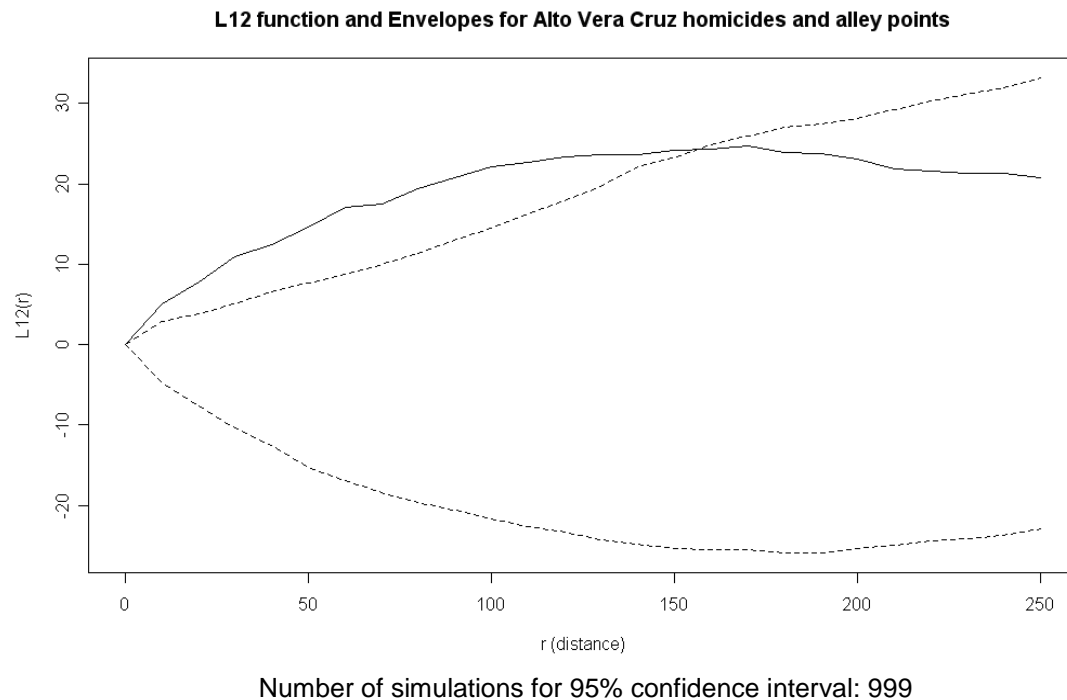
This graph, above, shows that when the observed L -function is compared to the envelopes, it tends to fall above them. That means there is evidence of attraction between the homicide locations and the drug-selling locations, especially when the distance between these events varies by between 10 and 200 meters. This result shows evidence in support of the hypothesis that homicides occur close to drug-selling spots.

In addition, in order to find the L -function for the point patterns of homicides relative to alleys, the alley lines of the address map were turned into points equally spaced along each line.

MAP 7:

Alto Vera Cruz alleys (as points)

In order to analyze whether homicides tend to occur near alleys or not, the alley lines were approximated by the point pattern shown in the figure above, and computed using the λ -function, as well as the corresponding 95% confidence envelopes, resulting in the following graph:

GRAPH 9:

As the graph above demonstrates, at distances shorter than 150 meters, the observed L -function falls above the confidence envelopes, which is evidence of attraction between homicide points and alleys. After 150 meters, the L -function lies in between the dotted lines in the graph. This suggests no interaction between homicides and alleys at this distance.

The use of spatial analysis techniques such as Ripley's K -function and L -function reinforces the hypothesis that homicides occur close to drug-selling spots and alleys. From a theoretical point of view, the Crime Pattern Theory shows that drug points are a significant variable in explaining the fact that there are hot spots in some areas and not in others. Therefore, these can be inferred

to be places that offer opportunities for crime, and which facilitate criminal activity. In addition, alleys, due to their geographical characteristics, seem to be strategic micro-places for illegal activities, hindering police control, hiding criminal action and making escape easier.

Furthermore, alleys may be paths that both victims and offenders use every day, while walking between drug spots, street corners, bars and other meeting places, as well as between their homes.

Based upon the Routine Activity Theory (Cohen and Felson, 1979), alleys may facilitate crime by attracting motivated offenders and suitable targets, in the absence of capable guardians.

6.2. THE IMPORTANCE OF ADDRESSING THE SPATIAL AUTO-CORRELATION COMPONENT IN THIS STUDY

There are two major reasons for taking spatial autocorrelation into consideration in this current study. First, this study uses geographical location of homicides as the main units of analysis. The main issue of using geo-referenced data is the spatial autocorrelation since it violates a standard assumption in statistical techniques that is the independency among observations in space. Spatial autocorrelation implies that there is some redundancy in the information provided by geo-referenced data. In this study, the spatial auto-correlation analysis explores the interdependency among observations of homicide incidents

in adjacent locations – whether there is spatial dependence in the homicide locations due to underlying common features. The spatial autocorrelation analysis avoids unstable regression coefficients and unreliable estimates of confidence intervals and significance levels in the regression model (Werneck, 2008:1758).

Second, the spatial autocorrelation analysis contributes to explain the nature of the geographical distribution of homicide locations throughout the AVC favela, being a key indicator for projecting locations where crime prevention interventions should be applied. In sum, the spatial autocorrelation analysis in this study is used to gauge whether the fact that a homicide event occurs at one location in the Alto Vera Cruz favela may prevent, or increases the likelihood of, a homicide occurring in a neighboring location.

6.2.1. THE NATURE AND STRENGTHEN OF SPATIAL AUTOCORRELATION

As previously mentioned, in this study, spatial autocorrelation is a key concept employed to measure and test how spatially clustered or independent homicide locations are, taking into consideration the similarities of their attributes. The spatial autocorrelation analysis reveals the extent to which the occurrence of homicides in one location may be influenced by the occurrence of homicides in nearby locations.

In the research, spatial autocorrelation is always classified as positive or negative (Werneck, 2008; Boots and Getis, 1988). A positive spatial autocorrelation signifies that high values of an attribute tend to be located closer together in space in the same way that low values of the same attribute tend to be located near other low values. On the other hand, a negative spatial autocorrelation, as stated by the author, implies that values of an attribute in one location in space and nearby values of the same attribute tend to be different on a map. That is, one location shows high values of the attribute while neighboring locations show low values of the same attribute and vice-versa (Werneck, 2008). Additionally, no spatial autocorrelation indicates a geographically random distribution pattern of the values of an attribute, or, in other words, “no correlation between neighboring values” (Boots and Getis, 1988:25.)

The nature and strength of spatial autocorrelation – the degree of proximity or distance between attribute values of a variable at each lag distance in space –, is measured by a spatial weight matrix. As described by Werneck (2008) the spatial weight matrix is computed as an index of covariance for a series of lag distances from each point on a map. A value of one is attributed for each pair of nearby observations, otherwise the value is zero. As stated in the GEODA manual the weight matrix defines “a local neighborhood around each geographic unit. The value at each unit is compared with the weighted average of the values of its neighbors. A weights file identifies the neighbors”
[://www.s4.brown.edu/s4/training/modul2/GeoDa2.](http://www.s4.brown.edu/s4/training/modul2/GeoDa2.).)

6.2.2. CREATING A SPATIAL WEIGHT MATRIX

Spatial weights are constructed by a series of operations based on either the distance between points or locations (e.g., point pattern), or contiguity from polygon boundary files (e.g., centroids for aerial data) (Anselin, 2003; Werneck, 2008). In any case, the choice of neighboring spatial weights influences any measure of spatial autocorrelation and the value of spatial lag (Werneck, 2008; Anselin, 1988).

In this study, in order to create a spatial weight matrix, the polygon data file of the Alto Vera Cruz favela was overlaid with a regular square grid using the CrimeStat and MapInfo software. This operation allowed for the data point of homicide addresses to be artificially aggregated in raster squares – small squares or pixels, and analyzed as area data. Each raster square on the map corresponds to a size of 20 x 20 meters. The logic was to find an appropriate size for squares, such that they were neither so large that great numbers of homicides would be recorded in each square, nor so small that no homicide location would be recorded in each square. Thus, the raster square grid on the map of the AVC favela allowed the creation of spatial weights, and subsequently, the analysis of spatial autocorrelation.

The spatial weight matrix was constructed based on contiguity from polygonal boundaries file of the Alto Vera Cruz favela using GEODA software. As stated in the GEODA manual “contiguity refers to what polygons are selected as neighbors for a single target polygon (GEODA, p.6.) The software allows specifying order of contiguity, for example, the value of a unit can be affected by the immediately contiguous units and also by second or third order contiguous units.

Two options are available to create contiguity weight matrix using shared boundaries: the Rook Contiguity and the Queen Contiguity (Anselin, 2003). The main difference between these two options rests on the criterion used to define neighbors. The Rook Contiguity option uses only common boundaries, while the Queen Contiguity incorporates all common points (boundaries and vertices) in the definition, thus resulting in a denser structure of connectedness (Anselin, 2003.) Once the spatial weight matrix was created, the next step, namely, spatial autocorrelation was analyzed using the *Moran's I* test.

6.2.3. ANALYZING MORAN'S I SPATIAL AUTOCORRELATION STATISTIC

The *Moran's I* is an example of a spatial autocorrelation statistic tool which indicates the degree of correlation among observations of the same variable in neighboring locations (Boots and Getis, 1988). According to Anselin *et al.*, 2008, *Moran's I* is a global statistic instrument in the sense that it indicates a global

pattern for a data set across a geographical space. It “indicates whether the null hypothesis of spatial randomness is satisfied for the complete pattern or map” (Anselin *et al.*, 2008:108). In order to conduct the *Moran's I*, a spatial weight matrix measuring the intensity of the geographic relationship among observations in a geographical area is required.

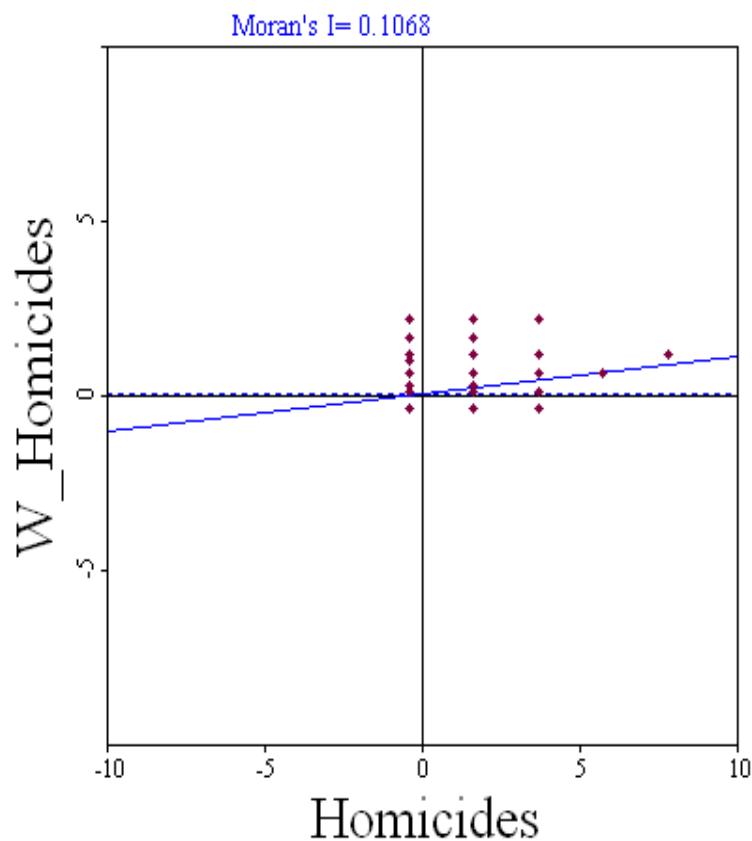
The values of *Moran's I* range from -1 (indicating tendency toward dispersion) and 1 (indicating tendency toward clustering). Thus, positive values indicate spatial autocorrelation while negative values indicate inverse correlation. Values around zero indicate tendency toward a random spatial pattern. The *Moran's I* statistic is visualized by a scatter plot in which the horizontal axis corresponds to the variable of interest, and the vertical axis is the spatial lag, defined as “the average of the values of neighboring locations” (Anselin *et al.*, 2008:112).

The *Moran's I* scatter plot shows four quadrants corresponding to four types of spatial autocorrelation. As described by Anselin *et al.* (2008) positive spatial autocorrelation is found in the upper right (high-high clusters or hot spots: high values surrounded by other high values) and lower left quadrant (low-low clusters or cold hot spots: low values surrounded by other low values) while negative spatial autocorrelation is found in the upper left (low-high spatial outliers: low values surrounded by high values) and lower right (high-low spatial outliers: high values surrounded by high values) quadrants.

In the current study, the *Moran's I* test for homicide records was computed in GEODA using a Rook-based contiguity spatial weight matrix, including immediate neighbors. The value of *Moran's I* coefficient is 0.1068. In order to assess the significance of the *Moran's I* statistic against a null hypothesis of no spatial autocorrelation, a permutation process is applied using the GEODA software. As stated by Anselin (2003) "inference for *Moran's I* is based on a permutation approach, in which a reference distribution is calculated for spatially random layouts with the same data (values) as observed" (Anselin, 2003:91.) In this study, a randomization test was used to perform 999 permutations to estimate variance and confidence intervals.

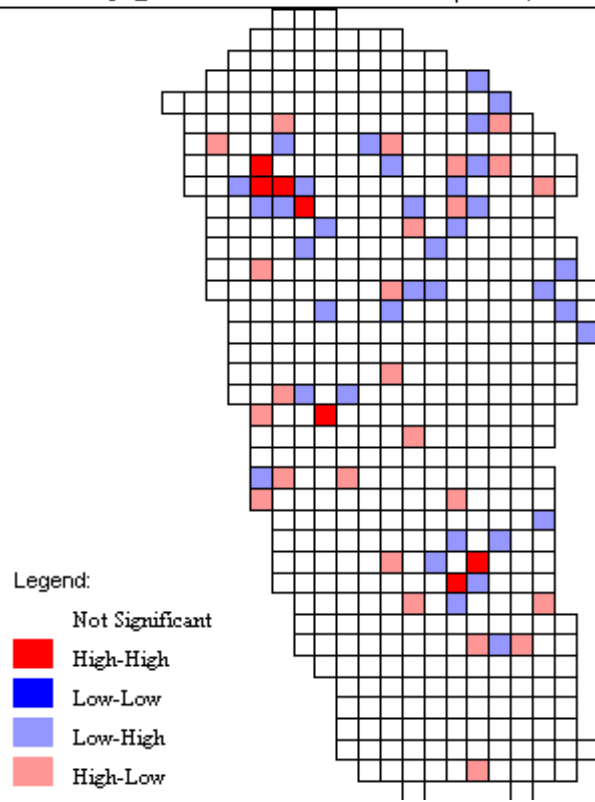
A scatter plot of *Moran's I* is illustrated in the following page:

MORAN'S I PLOT



The Moran's I plot suggests a positive, but minimal spatial autocorrelation (Moran's I = 0.1068.) This result is better illustrated by the Lisa cluster map that shows the four types of local spatial autocorrelation for those locations in the favela with a significant Moran's I statistic (p value < 0.001.) This map is represented below:

Cluster Map I_HOMICIDIOS in the AVC favela, Brazil (2000 - 2006)



The map above suggests weak evidence of clustering since the red squares that correspond to hot spots of homicides are not surrounded by dark blue squares that correspond to cold spots of homicides. For the map to indicate strong evidence of spatial autocorrelation, it would have to show both hot and cold spots of homicides. On the contrary, two examples of spatial outliers are dominant on the map. They indicate areas with low values (light blue) which are

next to squares with high values, and high values (pink) which are next to squares with low values.

The weak evidence of clustering may be related to the fact that in this study the Moran's I statistic is computed using numbers of homicides rather than homicide rates. In addition, it does not take into consideration possible variances of rates when the population at risk is not constant. This problem can lead to spurious indications of spatial autocorrelation as suggested by Anselin *et al.*, 2008, which could lead to skewed data. As indicated by Assuncao and Reis (1999) this problem could be corrected by using the Empirical Bayes approach through which each rate is standardized and then used in the computation of Moran's I (Anselin *et al.*, 2008:112.)

Furthermore, the minimal spatial autocorrelation shown by the Moran's I statistic differs from the result of the Ripley's K -function (previously discussed) which indicates a tendency toward a stronger clustering of homicide locations in the favela. One possibility for this contradictory finding may be the size of the raster squares (20X20 meters) – the area units of observations – used to create the spatial weight matrix used to compute Moran's I . The Ripley's K -function that uses homicide location (point data) as the main unit of observation shows that homicide points tend to be more clustered for distance greater than 65 meters among homicide locations. For anything less than 65 meters, on the other hand, there is no interaction among the homicide distribution points, which tend to occur in a random manner.

SUMMARY

To sum up, the spatial analysis of homicide data as discussed in this chapter corroborates the main research questions in this study: that homicides tend to be concentrated in some parts of the favela, and environmental features of the favela may help to explain why and how homicides tend to occur in specific locations. A more extensive analysis of the possible associations between situational factors and the occurrence of homicides at specific locations is provided by the matched case-control study which is discussed in detail in the next chapter.

OVERVIEW:

Chapter 6 presents the exploratory spatial analysis of homicide patterns in the Alto Vera Cruz favela, an important piece of the research design. It explains the point pattern analysis of the distribution of homicide locations by using Kernel function and Ripley's K -function, and G -function as well. In addition this chapter examines the auto-spatial correlation component of homicide locations.

CHAPTER 7

THE MATCHED CASE-CONTROL STUDY AND ITS FINDINGS

This chapter describes and explains the matched case-control study itself, including: (1) the features of the case-control study, (2) the sampling process, (3)

data, (4) the main predictor variables and the respective conceptual framework, (5) data collection through the systematic observation of independent variables, (6) the main difficulties related to measure situational factors and (7) the statistical analysis and findings.

7.1. FEATURES OF THE CASE-CONTROL STUDY

The case-control study is a very common method in Epidemiological researches. It is applied to compare a group of “cases” that share an outcome variable of interest (e.g., individuals with a disease) with a group of “controls” that do not share the outcome (e.g., individuals without the disease). Cases and controls are compared with respect to exposure to similar conditions during a certain period of time. The main objective is to identify possible risk factors which contribute to the emergence of the outcome (Dobrin, 2001.)

In the case-control study, the association between the outcome of interest and the supposed causal factors is individually determined for each pair of case-control, and then aggregated. This makes it possible to verify which possible causal factors are directly associated with the outcome being studied, as opposed to those which are just related by a common cause (Dobrin, 2001.)

The retrospective nature of case-control studies allows the researcher to compare characteristics between case and control groups, and to analyze whether differences between them are significant.

The use of case-control methodology is not new in Criminology, as argued by Loftin and McDowall (1988:86). It has been considered a feasible method in order to investigate causal hypotheses about relatively rare events such as homicide victimization or perpetration. Moreover, it is considered a low cost and less time-consuming method in comparison to cohort studies (Goodman *et al.*, 1988:74).

Cohort studies involve groups of subjects that do not present the outcome of interest (e.g., homicide). Thus, the cases and controls are defined in terms of their exposure or lack of it to the suspected risk factor (e.g., alcohol use). Because of this, cohort studies, as opposed to the case-control design, involve an extensive length of time for the screening in of a large sample of subjects who were, or were not, exposed to the risk factor in order to determine the incidence of the outcome (Goodman *et al.*, 1988.)

In addition, because case-control studies are based on an individual level of analysis, they have the advantage of being less susceptible to an ecological fallacy than research designs based on a multivariate analysis using aggregate data (Loftin and McDowall, 1988.)

Furthermore, the case-control study is considered more reliable than quasi-experimental research designs, such as time series designs and cross sectional studies. As Dobrin (2001) argues, these methods cannot predict the causal relationship between independent and dependent variables at the individual data level (Dobrin, 2001:159).

With advances in problem analysis, case-control designs have also been considered well suited for the comparison not only of similar groups of individuals, but also of similar places, times and events which are perceived as troublesome under other methodologies. In addition, it has proved to be an appropriate method for the evaluation of crime prevention responses. It can be employed to verify the occurrence of geographical and temporal displacement of crime, as well as the displacement of other targets, tactics and crime types (Clarke and Eck, 2005). In other words, the use of case-control designs facilitates the analysis of the relevance that environmental and situational factors might have on explaining not only how and why some individuals who are exposed to hazardous conditions are more victimized than others who were not, but also how and why certain places, times, and events have a high incidence of crimes while others are free of crime. As a result, the use of case-control data might contribute to the development of more precise and feasible crime prevention interventions.

A good example of research work using a case-control design is the study conducted by John Eck in the early 1990's in San Diego, California. This study explains why a few places in San Diego were persistent drug dealing locations while the vast majority of other nearby places was not (Clarke and Eck, 2005: Step 32). Another example is the research on convenience store robberies conducted by Hendricks Scott and colleagues (1999). This study revealed that specific characteristics of the population and the environment surrounding the

observed convenience stores were significantly associated with robberies in such facilities (Hendricks *et. al.*, 1999:995).

Another major study using case-control design was conducted by Susan Wernike in order to examine the association between certain types of bars and crime (Clarke and Eck, 2005).

In the current study, a matched case-control design is used in order to analyze situational factors and homicides in the Alto Vera Cruz favela. It is a rare example of a case-control design in which the subjects (the cases and the controls) are geographical locations rather than individuals. This study explores possible predictive factors that might explain the relative risk of homicides in certain places, taking into account the differences between the characteristics of addresses where homicides occurred (the cases) and addresses free of homicides (the controls).

7.1.2. THE MATCHED CASE-CONTROL STUDY

As opposed to standard case-control studies, in a matched case-control design, each case and control pair is matched for some relevant confounding variables. These are third variables that might affect the association between the exposure factors and the outcome of interest. Confounding variables might distort or bias the estimation of the relative risk of the outcome of interest, making it difficult to determine what the supposed causal factor is. Common examples of

confounders are age, gender, occupation, and location. Matching cases and controls on confounding variables makes the cases and controls more comparable, thus making the experiment stronger.

In this study, the main assumption is that the cases and the controls are matched with respect to space and place. For the space dimension, each matched homicide address and its corresponding control address are located within a geographical space that shares similar social disorder factors (including litter, unfinished houses, and graffiti) making them comparable to each other.

Where the place dimension is concerned, the selection of each pair of case and matched control is based upon the main criterion that each control address must be located at a minimum distance from the corresponding homicide address in order to facilitate comparison. The distance between the observed addresses must not be too little, or they would be overly homogenous, thus making comparison difficult. At the same time, the distance between the observed addresses must be not so large that the two observed addresses are too different from one another to be meaningfully compared.

7.1.3. LIMITATIONS OF CASE-CONTROL STUDIES

One of the limitations of the case-control study is its susceptibility to sample biases due to the fact that the samples of cases and control groups are not drawn from the entire population. This leaves uncertainty whether the group

of selected cases is indeed a random sample of all people “with the disease,” as well as whether the control group is a random sample exclusively of people “without the disease” (Dobrin, 2001). I

In the case of the matched case-control study of homicide, the sample is biased, as the selection of the addresses free of homicides (the controls) was not randomly made from all the addresses in the entire geographical area of the Alto Vera Cruz favela. Instead, each control was selected from among all addresses located at a certain minimum distance from its corresponding homicide address. The homicide addresses (i.e. the cases), moreover, were selected from official police records, and therefore, any lack of information in these records could lead to inconsistencies and must be verified.

According to Dobrin, 2001, another limitation of a case-control study is the information bias that is related to the use of retrospective measures to explain the influence that risk factors or predictive variables have on a specific effect or outcome. The main problem is the memory failure of “patients” in the case group. That is, they are often unable to remember all the main factors to which they were exposed that could have contributed to the development of a specific “disease”.

In the current study, the information bias could be related to the deficiency of information on situational factors at the crime locale at the time the homicide occurred. This makes it difficult to retrospectively analyze the effect that situational factors might have had in creating opportunities for the occurrence of

homicide at the addresses where they did indeed occur. This type of data is often unavailable, inconsistent, or containing incomplete and inaccurate information, which may invalidate the reliability of the analytical findings. However, as the environment of the studied favela and crime locale has not undergone any drastic intervention in the last ten years (see URBEL, 2000 Plano Global Especifico, Alto Vera Cruz favela), the problem of information bias related to situational factors may be reduced.

In addition, the information bias can be controlled since police inquiries on homicides are used in order to collect retrospective detailed information about homicide settings. These include descriptions and photographic information collected by crime scene investigators.

Another limitation of the control study is its failure to directly determine the absolute risk of a specific factor for a determined population. What the study does is to estimate the relative risk of predictive factors based on the calculation of an odds ratio (OR) (Dobrin, 2001), as explained below.

7.1.4. ODDS RATIO: ESTIMATING THE RELATIVE RISK OF HOMICIDES

The odds ratio, also called chances of ratio, measures the intensity of a causal association between variables. It calculates the chances of observing cases that are exposed to risk factors, over the chance of observing controls that

are exposed to the same factor. If the value of the odds ratio equals 1, exposure to the risk factor is equivalent for both the observed cases and control groups.

The calculation of OR allows the associated relationship between variables to be determined by a more specific and accurate manner for each pair of case-controls individually, to be aggregated subsequently. This makes it possible to identify which factors are more directly and significantly related to the outcome, and which are related merely by ordinary association (Dobrin, 2001). As a result, the case-control study is considered to be a valuable analytical method, which offers the benefit of creatively testing new hypotheses.

7.2. SAMPLING PROCESS

The main data source for the sampling process is the homicide database of the Homicide Division of the Civil Police in the state of Minas Gerais – DCCV/PCMG, which is considered more complete than the Military Police database, as discussed in Chapter 1. In addition, addresses from the Alto Vera Cruz favela from Belo Horizonte's Department of Data Processing, PRODABEL, were also used.

The sample selected for this study includes 200 addresses which comprise the main units of analysis. These include an equal number of homicide addresses (100) and control-addresses, i.e. addresses free of homicides (100). The sample of homicide addresses was selected from the official homicide

records, while the control-addresses were selected using the address data system, which includes the Alto Vera Cruz favela and consists of a total of 3942 addresses. The sampling process takes into account the possible bias common to case-control studies, by establishing some procedures that are discussed in detail below.

7.2.1. SAMPLING SELECTION PROCESS

a) The Cases: Homicide Addresses

The selection of reliable homicide addresses consists in the analysis of the police homicide database with the objective of gleaning data through the examination of quality information and the elimination of repetitive addresses with multiple victims. This preliminary procedure creates the basis for the geo-coding process of homicide addresses within the Alto Vera Cruz favela digital map, using MapInfo Software.

a.1) Sifting and Filtering Homicide Data:

The original police database includes 170 homicides that occurred in the Alto Vera Cruz favela from 2000 to 2006. However, during the sampling process it was verified that as a result of the format of the DCCV/PCMG database, the number of official homicides recorded is associated not only with the number of

victims murdered, but also with the number of offenders and suspects involved in each incident. In incidents involving a homicide victim or victims, and more than one offender or suspect, the system records the incident not once, but as many times as there are people involved in the killing. For this reason, the crime address in each incident is repeated as many times as the number of fatal victims as well as the number of suspects involved.

An additional problem about the homicide database is that the addresses recorded by the detectives often do not correspond to the Alto Vera Cruz favela. This is because the investigators who are responsible for the crime scene are themselves so confused by the disorderly numbering of addresses, and – often unfamiliar with the borders –, that separate the AVC favela from two other neighboring slum areas, and so they often end up recording addresses that belong in neighboring slums. As a result, it became necessary in the course of this research, to drop homicide records not pertaining to the favela in study. In addition, homicide records corresponding to offenders and suspects who had been included in the same incident reports were eliminated, thus reducing the number of cases studied from an initial 170 to 112.

Two homicide records at the same address (corresponding to multiple victims in the same incident) were also dropped, further reducing the number of homicide addresses from 112 to 110.

The next step in selecting the sample of homicide addresses to be studied was to examine the accuracy of the data quality. The objective of this

examination was to control or reduce possible problems related to the inadequacy or incomplete nature of the information related to the homicide addresses in the Alto Vera Cruz favela. Thus, only the addresses that had full and accurate information were selected. This information includes the name and the number of the street where the homicide had previously occurred.

Based on the criteria cited, ten cases with incomplete addresses were dropped reducing the number of homicide cases in this study from 110 to 100 homicide addresses. In order to conduct this sampling process, homicide addresses were geo-coded using MapInfo software and the Alto Vera Cruz address database provided by PRODABEL.

The table in the next page shows the number of homicide addresses from 2000 to 2006, the number of cases that were dropped, and the total number of homicide addresses with full information that finally remained.

TABLE 5: HOMICIDE CASES IN THE ALTO VERA CRUZ FAVELA, BRAZIL (2000-2006)		
TOTAL NUMBER OF HOMICIDE ADDRESSES	NUMBER OF DROPPED ADDRESSES	NUMBER OF HOMICIDE ADDRESSES WITH FULL INFORMATION IN THE STUDY
110	10	100

The deficiencies and inaccuracies of the information related to the homicide locations, mainly in the favelas, reflect a complex problem related to the disorganized process of urban occupation as well as the difficulties municipal authorities face when they try to update addresses and other information.

The absence of logical numerical sequences for street addresses is very common in favelas, especially where there is a concentration of streets connected to alleys. This lack of proper house numbering leads to the same problem in adjacent alleys, thus breaking the logical address sequencing throughout favelas.

Another challenge to maintaining any semblance of record-keeping order is that residents commonly create their own address numbers, making it necessary to constantly update the official address database. This frequently confuses the police who are unfamiliar with the neighborhood. At the same time, the process of updating addresses is a slow one, because verification is undertaken on foot by professionals unfamiliar with the areas. It is also a time consuming and complex task due to the presence of armed drug dealers in different areas of the favelas making access to certain parts difficult for municipal employees responsible for updating address registers.

In addition, police lack technological resources, such as GPS tools, which complicate the investigative work of the detectives responsible for collecting initial evidence at the crime scene. Detectives unfamiliar with the urban layout of

the favelas in which they are assigned can commit costly errors in registering addresses where crimes have occurred.

b) The Controls: Addresses Free of Homicides

The main consideration in selecting the control address sample is to ensure that control addresses are a reasonable distance from addresses where homicides took place, thus enabling accurate comparison between the two. Through a trial-and-error process, the best distance between the homicide addresses and the control addresses was established using the Alto Vera Cruz (AVC) address database and the geo-coding of all the homicide addresses through MapInfo crime-mapping software. The trial-and-error process is based on the following criteria:

- In order to facilitate comparison, each control case must be located at a certain minimum distance from the corresponding homicide addresses. Thus, control addresses cannot be too near homicide addresses, because they would be overly homogenous to allow comparison. In addition, control addresses cannot be too far from homicide addresses as they would be too different from one another to be compared.

In order to define the minimum distance between homicide and control addresses three distances were tested as discussed below.

b.1) Trial and Error Process: Searching for the Optimum Distance between Homicide and Control Addresses.

When first selecting a sample, it was decided that each control address would be randomly chosen from among all AVC addresses that were at least 100 meters away from any homicide address, thus guaranteeing all addresses an equal probability of being selected. *R Language Code*, a statistical environment which allows the manipulation and analysis of data through infinity of functions, was used.

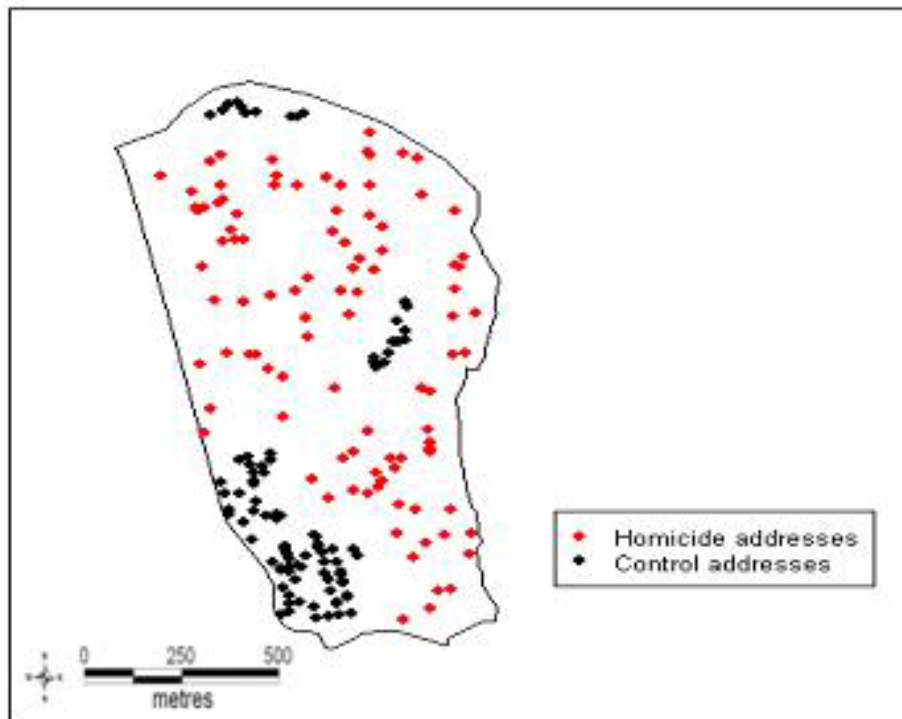
The *R Language Code* randomly draws one address from the total number of addresses contained inside the area of the Alto Vera Cruz favela and verifies that the address drawn is at least 100 meters from any homicide address. If the address drawn is within the specified distance and hasn't been selected previously, the *R Code* will maintain it as a control address; if not, it will eliminate it. This process will be repeated until the total number of different control addresses is equal to the total number of homicide addresses.

The *R Code* commands are very simple and allow the calculation of the distance between two points, the random selection of a point among a set of points, and the verification of the selected point inside the specific polygon or

area. This guarantees the consistency and reliability of the selected control cases.

The resulting control-address sample distribution was obtained, as showed in the map in the next page.

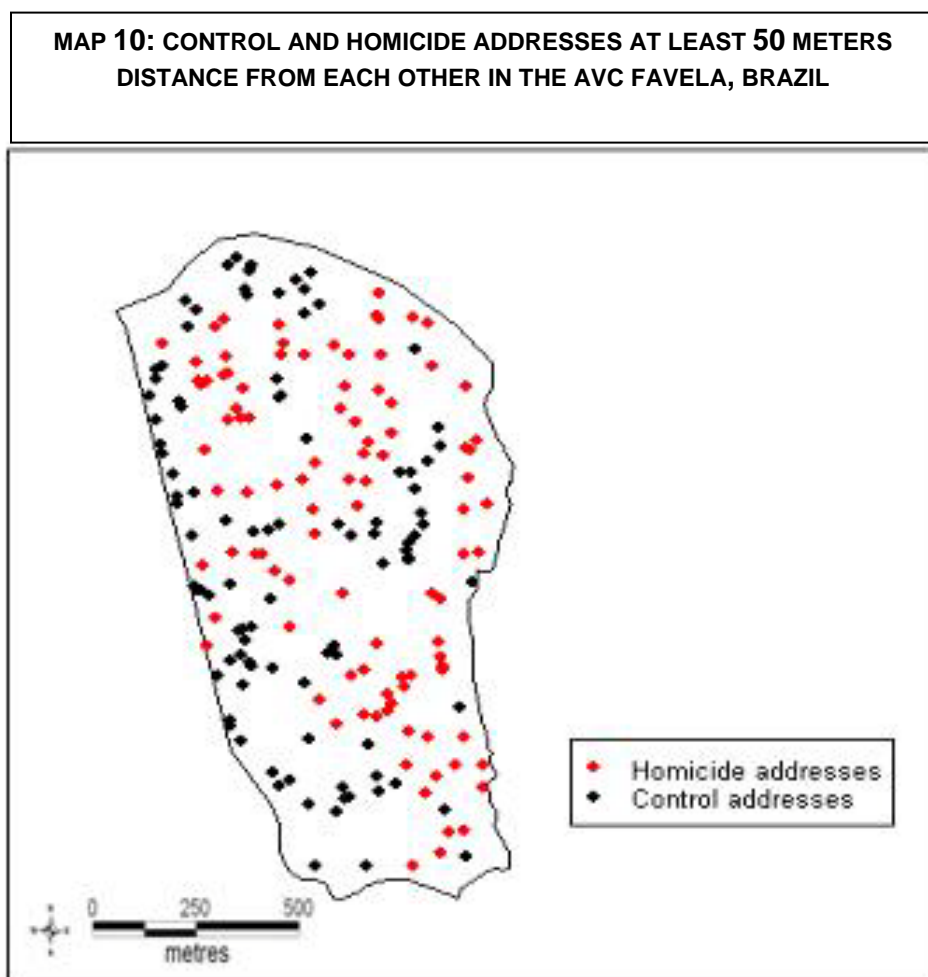
MAP 9: CONTROL AND HOMICIDE ADDRESSES AT LEAST 100 METERS DISTANCE FROM EACH OTHER IN THE AVC FAVELA, BRAZIL



As shown in the above map, in which the black dots represent the control addresses, and the red dots the homicide addresses, the greatest disadvantage of using 100 meters as a criterion is that the homicide addresses and the control addresses are located in parts of the Alto Vera Cruz favela that are so different from each other that it invalidates the process of comparing similarities and differences between them.

Therefore, aiming to shorten the distance between homicide addresses and control addresses, a 50-meter distance was decided upon. Again the *R*

language Code was used, following the same procedures. The following spatial distribution was obtained:



Even using 50 meters as the criterion, the control addresses represented by the black dots in the map above are concentrated in specific parts of the Alto Vera Cruz favela, or located either in the upper or lower part, which makes

comparison difficult. To obtain a logical solution to this problem, the control sample was modified to include those addresses within these 50 meters nearest to the homicide addresses.

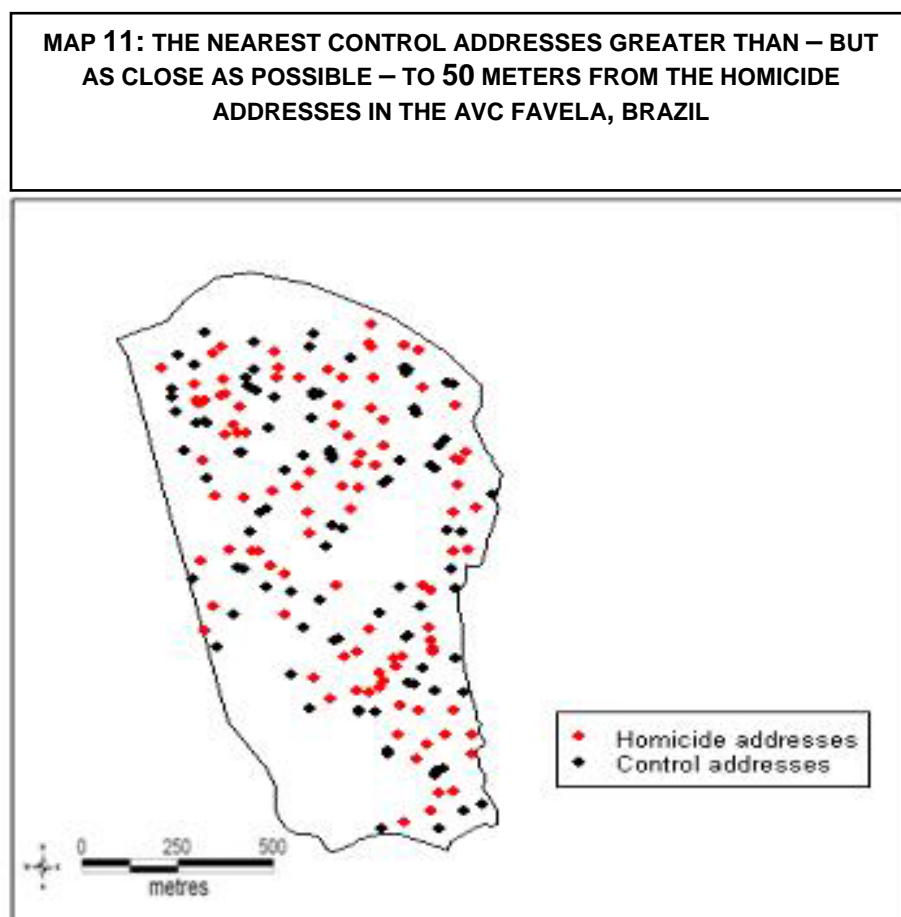
The selection of the control address nearest to a homicide address is done individually, using the *R language Code*. For each selection of a control address, the *R Language Code* first calculates the distance between all the control addresses, which are randomly selected from a sample of addresses more than 50 meters from the homicide addresses, in relation to one homicide address.

Second, the *R Language Code* coordinates all these addresses, from the nearest to the farthest address, and finally, it selects the first address that falls within a distance closest to fifty meters of the homicide address. Based on these criteria, the process of selecting the shortest distance is as follows:

- a. If two control addresses are found to be the same distance from a homicide case, one of the control addresses is randomly selected.
- b. If two homicide addresses correspond to the same control address, the address further away from the homicide case is selected.
- c. If the second nearest control address, with respect to a homicide address, is also the control address corresponding to a different homicide address, then the third closest address from the homicide address is chosen.

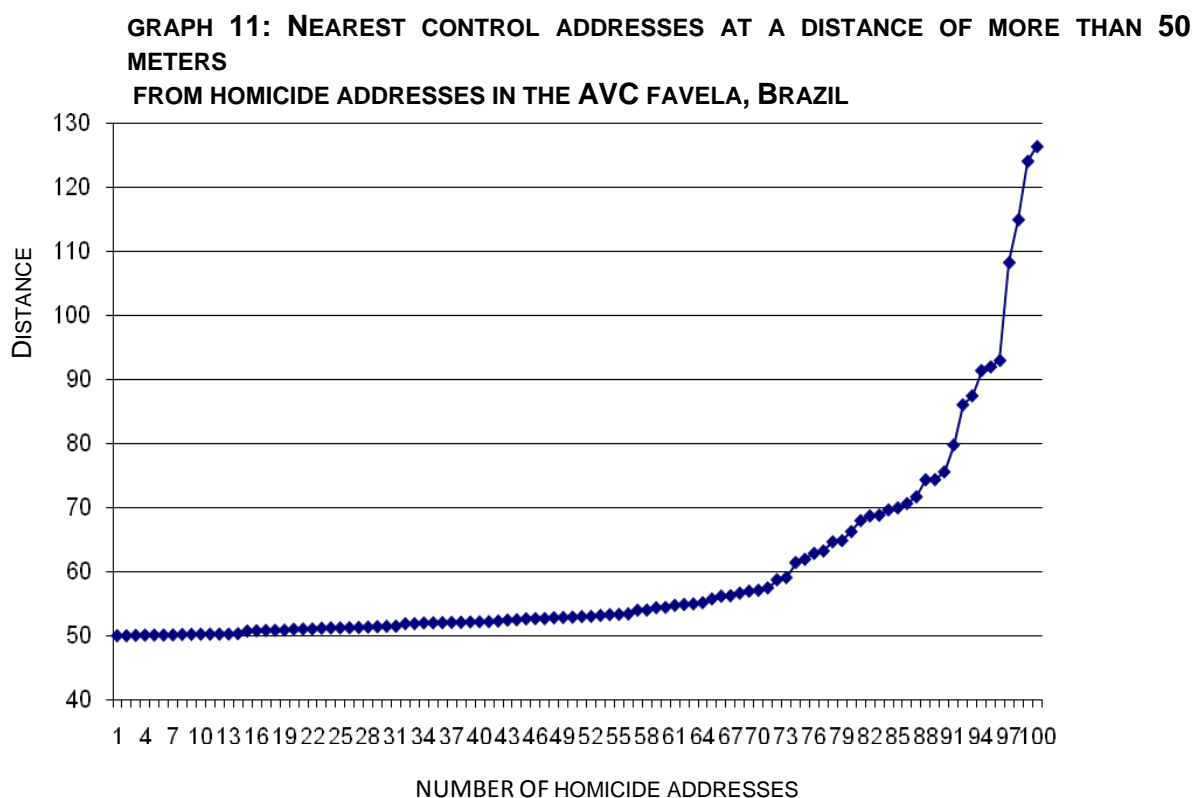
This selection process is repeated until the total sum of different control addresses is equal to the total number of homicide addresses.

The following map illustrates the distribution of control addresses in relation to homicide addresses in the Alto Vera Cruz favela.



As shown in the above map, the distance that works the best for control addresses is the nearest control address that is greater than, but as close as possible to 50 meters from the homicide addresses. As shown in the map, at this

distance, the control addresses (blue dots) are more uniformly distributed throughout the favela. Since they are closer to the homicide addresses (red dots), they now facilitate comparison between these addresses, and make it more reliable. The following graph shows the distance in meters from each selected control address to each homicide address:



As shown in the graph above, 73 out of 100 control addresses in the Alto Vera Cruz favela are 50 to 60 meters away from addresses where homicides were committed. The remaining 27 control addresses are 60 to 130 meters from homicide addresses.

As a result of the sampling process, for each selected case, there is a control address to be observed so that similarities and differences can be examined. The next section provides a description of the data used in this study.

7.3. DATA

The hypotheses presented in this study are based on the collection of different types of data as follows:

I. PRIMARY DATA:

- Primary data collected from the systematic observation of the characteristics of situational factors on 100 homicide addresses, as well as on 100 addresses free of homicides in the observed favela. Field observation is considered a powerful method for identifying details of environmental and situational factors which can be critical to explaining how and why crimes occur at specific places – details which secondary data or statistics do not reveal.

II. SECONDARY DATA:

- Secondary data obtained from the Homicide Division of the Civil Police in the state of Minas Gerais, comprising 100 homicide statistics compiled between 2000 and 2006 as previously discussed. The database contains information on

the main characteristics of homicides that occurred in the Alto Vera Cruz favela: addresses, times of slaying, victims' names and addresses, and probable suspects. For the purpose of this study, the analysis of homicide data focuses principally on statistics related to geographical location and time of crime.

- Secondary data about 37 location of drug trafficking areas and borders of 7 gang drug turfs obtained from the Military Police Precinct in Belo Horizonte.

In addition, this study includes the use of complementary sources of information on the circumstances under which homicides occurred in the favela. This information is used in order to gain a better understanding of the problem. These sources are: (1) **Photographs** showing details of the environment and supporting the data collected during field observation and (2) **Police inquiries** related to homicide incidents that occurred between 2000 and 2006.

927 photographs were taken during the observation of 100 homicide addresses and 100 addresses without homicides. They are used to analyze the differences between these observed addresses, helping to refresh the researcher's memory on their main features.

Police inquiries are aimed at answering the following questions: why, how and when was the murder committed? Who was involved? Such inquiries are of major importance to the judiciary police in initiating criminal proceedings. These police inquiries provide socio-demographic information about victims, such as

their age, address, parents' names, educational level, occupational status, race and criminal records. They also include witnesses' statements, information about victims' acquaintances and enemies, modus operandi of the killing, motives, and information about the main suspects. The inquiries also provide information about autopsy results, including the number of shots fired and ballistic results. Sometimes, they include results of blood tests measuring alcohol and drug levels, as well as detailed descriptions and photos of crime scenes, including the trajectory of the victim before the murder. Although information on crime settings is crucial to understanding opportunities for crime, such data is not always part of police inquiries. Much of the quality of information in police inquiries depends on the capabilities and experience of detectives involved in each case. And because detectives are more interested in finding out who committed the murder rather than understanding the opportunities that enabled the occurrence of the crime, police inquiries often lack more systematic and precise information about victims' paths, and about situations that structure the crime setting. Therefore, police inquiries are used as complementary data for a more comprehensive and descriptive analysis of homicides in the favela.

The data sources having been defined, the next section describes the study's main variables.

7.4. MAIN VARIABLES

In this study, the dependent variable is the location of the homicide, while the main independent, or predictor, variables include a range of eight types of environmental factors, namely (1) drug-areas, (2) bars, (3) alleys, (4) bus stops, (5) commercial establishments, (6) public phones, (7) vehicular traffic, (8) the street-facing windows of homes, and street lighting. The number of independent variables takes into account the sample size of this study, comprised of 100 matched pairs of homicide and control addresses.

The selected predictor variables are based on Professor Felson's concept that crime is a "*physical process*", and "*settings are the central organizing feature of crime and its absence*" (Felson, 2002:21). Thus, these variables attempt to hypothetically reproduce the main situational factors that might play a central role in creating a favorable setting for homicide in specific addresses in the Alto Vera Cruz favela. Additionally, the main independent variables rely on the principal concepts of crime opportunity approaches or so called theories of environmental criminology, as described below.

From the Routine Activity approach, the predictor variables borrow the general concept that three elements (a likely offender, a suitable target, and the absence of a capable guardian against the offense) have to converge at the same time and place for a crime to be committed. This idea indicates that crime is less likely to occur in the absence of any one of these factors.

From the Crime Patterns Theory, the predictor variables adopt the idea that crime does not occur randomly. Rather, it is more likely to occur in the overlaps of victim-offender' nodes of routine activity, and the pathways between these nodes. In the favela, offenders and victims, like everyone else, have a limited movement pattern and area of activity. They spend most of their everyday life in the same favela in which they reside, and are involved in similar routine activities. Offenders and victims tend to know each other (there is a high chance that the offender and victims are neighbors who had attended the same local school); they spend time with friends, hang out on street corners in which drug trafficking is active, as well as in bars which constitute the few entertainment places in the neighborhood. Based on the Crime Pattern Theory, this study assumes that murder in the Alto Vera Cruz favela is more likely to occur at those times and places in which the space awareness of the offender transects with suitable victims in their everyday activity nodes – near homes, bars and drug areas – and on the paths between them.

From the Rational Choice Perspective, the predictor variables borrow the main assumption that offenders seek their own benefit. The behavior of offenders, like the behavior of any human being, is based on a rational decision-making process, in which thinking mechanisms are active with a view to evaluating the best choices available under certain circumstances, to fulfill immediate motives. These choices might involve a complex, or poor, rational

process, but always seek to reduce the costs, in terms of efforts and risks, and to increase the benefits from the offender's point of view. As Wortley states,

“According to rational choice perspective, the immediate environment is the source of information that an individual uses to decide whether or not to commit a contemplated crime. Potential offenders weight up the likely outcomes of illegal behavior and commit crime if the benefits are judged to outweigh the costs” (Wortley, 2008:48).

Inspired by the main concepts of environmental criminology as described above, each predictor variable in this study represents a possible situational opportunity that might facilitate offender-victim encounters, and benefit the offender in the commission of crime. These variables are divided into two categories – convergence variables and commission variables. The latter include situational factors that reduce the risks for murderers, while the former reduce the efforts required for crime. As a result, the main assumption is that changes in both convergence and commission variables can intervene in the offender's cost-benefit calculus in committing murder at specific places and times in the favela in question. Each of these main categories is discussed below:

7.4.1. CONVERGENCE VARIABLES:

According to the Crime Patterns theory, motivated offenders are attracted to places which offer multiple opportunities for crime. Good examples are prostitution and drug areas, and entertainment spots that are well known to

offenders as enabling criminal activities (Clarke and Eck, 2005:Step17). In addition, according to Wortley (2001) such situations not only provide opportunities for motivated offenders to commit criminal acts, they also provide temptations, inducement and provocations that lead to criminal behavior. According to this author, *"Immediate environments can also actively encourage or induce individuals to commit crimes that they may not have otherwise contemplated at that time"* (Wortley, 2001:48). In the case of a complex predatory crime such as homicide, an environment that is known to offenders as providing opportunities for crime can also create an atmosphere that encourages deviant behavior. Drug areas and bars function as crime attractors, and they are prime examples of convergence variables in this study. Not only can they provide a likely environment for offender-victim encounters, they can also provide an atmosphere of temptation and provocation that can lead to violence as discussed below.

1. DRUG AREAS:

The main assumption is that drug selling areas in the Alto Vera Cruz favela attract both victims and murderers. Individuals willing to kill, thus require less effort to hunt for victims. Victims and offenders share not only geographic space, but also socio-demographic characteristics and lifestyles. They not only live in the Alto Vera Cruz favela, but are also involved in similar routine activities such as drug trafficking - either as users or as dealers. They are not strangers to

each other, but acquaintances who have grown up in the same neighborhood. According to the police, both victims and offenders belong in the group of people who have a higher chance of being victimized in the favela under study. As the saying goes, *“today’s murderer is tomorrow’s victim.”*

Analysis of homicides that occurred between 2000 and 2006 in the Alto Vera Cruz favela show that in 43 out of the 45 cases where information was available on the involvement of the victim with drug activities, the victims were known to witnesses as being drug users, or were involved with local drug-trafficking at the time they were killed. Although police records fail to provide detailed information on suspects, police investigators found that murder-suspects as well as their victims are usually involved in drug trafficking. For this reason, it is highly likely that victims and murderers will circulate in the same geographical spaces and routes in drug-selling areas, and therefore, drug areas may be the catalyst that facilitates victim-murderer encounters, reducing the effort required for crime. These areas may provide the context for interaction – murderers may find their victims on the paths leading to the open drug-selling spots in areas where drug-trafficking groups are active.

Drug areas are also settings that create a favorable environment for violence due to the availability of guns, and the pursuit of drug activities in public spaces. In such areas in the Alto Vera Cruz favela it is common to see suspicious individuals – typically wearing long-shorts, t-shirts, flip-flops or tennis shoes, some with hats, some with colored hair – hanging out, often in groups, on

street corners or near bars. They also hang out at the main entrances of drug areas, formed by alleys in which part of the residents of the favela reside. In such locations, they blend in with local pedestrians going back and forth in these areas, as well as with kids who are playing around. These individuals might be look-outs for drug dealers, or drug sellers. Walking through the favela, it is also not rare to see young males selling drugs in more hidden alley settings, or on strategically wide-paved streets, while some local drug addict, called "*noia*" (as they are known in drug-dealers' jargon) walks around. Some individuals are "mules" of the drug trade, carrying drugs from one drug spot to another, while others are "drug trafficking soldiers," protecting the drug dealer "lords," as explained by a drug dealer in the Alto Vera Cruz favela.

Disputes and acts of revenge arise as part of the everyday life of those involved in drug-trafficking groups, often leading to their premature death. Police data on 55 of 112 murder victims in Alto Vera Cruz favela between 2000 and 2006 whose ages were known, reveals that forty-one individuals (74.54%) were between 14 and 30 years old at the time they were shot to death. Thirty-four (82.925) out of forty-one victims were involved in drug activities. Motives for killing are related to ordinary conflicts involving drug debts; disputes for drug spots, betrayals among members of rival or even allied drug-trafficking groups. They might also be the result of minor offenses such as insults, dislikes, hatred, personal differences and disputes – for example over a girlfriend, for recognition and power, or driven by mere excitement.

Up until 2007, the police had identified eight different groups related to drug activities and 37 drug selling spots known as *boca de fumo* in the favela being studied. An area divided into various drug trafficking turfs provides not only an atmosphere of temptations and provocations, but also opportunities enabling the convergence of offenders and victims, requiring reduced efforts for the commission of murder.

In this study, drug areas are measured using police information on the location of drug selling spots and the borders of active drug-related gang areas.

2. BARS

Bars constitute another type of convergence variable. Open all through the day, bars are one of the few places in the poor community of the Alto Vera Cruz favela that offer joy and entertainment to its residents, along with the few luncheonettes, pizzerias and ice-cream stores. At the same time, these establishments provide a means of economic survival for many families. According to one bar owner who resides in the favela, "*There are over 350 bars in the Alto Vera Cruz favela and these are created and closed overnight.*"

Although there are no official statistics on the total number of bars in the favela, it is important to bear in mind that the urban environment of the favela itself, lacking planning and design, results in the fact that most houses and commercial establishments are randomly built without the supervision of any

formal mechanism of control and regulation. It was only in 2006 that an Office of Occupancy Regulation and Urban Control was created as part of the URBEL – the Urban Company in the city of Belo Horizonte. One of the responsibilities of this office is to oversee urban control in favelas. However, to date there is no official information on the exact number of buildings in such areas, including stores and bars, whether licensed or not. The lack of precise data implies that bars still function without being officially supervised. Many of them may be unlicensed and untaxed establishments, which contributes to making them likely places for illegal activities.

Furthermore, the literature shows that many factors help to explain how and why bars attract violence. One factor is alcohol consumption. The link between alcohol and violence is clearly stated in Clarke and Eck (2005) who argue that alcohol, like drugs, is one type of chemical crime facilitator that helps to increase an offender's ability to ignore risks and moral prohibitions (Clarke and Eck, 2005). A study conducted by Louw and Shaw, 1997, in Northern Cape in South Africa reveals that alcohol consumption in "shebeens" (the name for bars in poor communities in South Africa) is the main contributor to the very high levels of violence that exist there including domestic violence, child abuse, assault and murder. As the authors state:

"Shebeens are open throughout the day, and several sell liquor to teenagers and children – many of whom are sent to buy alcohol for adults. Shebeens are the locus of much violence, particularly over weekends, and alcohol is believed to be the driving force

behind most assaults. Characteristically, both victims and offenders of violent crimes are under the influence” (Louw and Shaw, 1997, <http://www.issafrica.org/Pubs/monographs/N014/Part2.html>).

The undisputed link between alcohol consumption and violence is also supported by a study conducted by Duailibi *et al*, (2007), which shows that in Diadema, one of the most violent Brazilian cities in 2000, 60 percent of homicides and 45 percent of complaints about violence against women occurred between 11:00 p.m. and 6:00 a.m., in neighborhoods with a high concentration of bars.

In addition, Holmel *et al.*, 2004, argue that public drinking places provide not only liquor, but also all types of pleasure, being often permissive of deviant behavior. As the authors argue:

“Nightclubs and bars do not sell only liquor; they sell food, entertainment, excitement and perhaps drugs and they provide – at a cost – spaces for strenuous physical activity, for meeting others, for sexual liaisons and generally for behaving outrageously with relative impunity.” (Homel et al., 2004:20).

Additionally, the link between bars and violence is further explained by the social and physical environment and management practices in these places, as suggested by James Roberts, 2007. The author states that bars, known for their tolerance of anti normative behavior, create an environment that encourages aggressive conduct, attracting violence prone patrons.

Inspired by the substantial literature on bars and violence, and based on the assumption that most of the bars in the Alto Vera Cruz function without supervision and control, this study considers bars as crime attractors. This implies that bars are likely predictors of locations in which there is a higher chance of homicides in the Alto Vera Cruz favela.

In this study, bars are defined as public drinking places less than 15 meters distant from the control and homicide addresses.

7.4.2. COMMISSION VARIABLES:

Commission variables are characteristics of places or situational factors that tend to reduce the risks for motivated offenders to commit homicides by imposing obstacles to formal and informal surveillance mechanisms and by allowing easy means of escape. As argued by Professor Clarke, “crime is always a choice”, and whether people choose to commit crime “depends on a rough calculation of the chances of obtaining the reward and the risks of failure – arrest, punishment, a physical beating, humiliation, etc” (Clarke, 2008:179). Even an expressive violent crime such as homicide involves rationality.

The act of killing which conventionally seems to be deliberately undertaken, also involves the offender’s perception of environmental clues which renders favorable the setting of the victim-offender encounter. Individuals with a disposition to kill might judge that there is less risk in committing murder with

impunity in places where surveillance is limited, where access is easy, and where easy escape routes are available. This might reduce the risk of being seen, caught, and punished, thus intervening in the offender's cost-benefit equation as suggested by the Rational Choice Perspective. Based on this concept, the commission variables in this study include interconnected alleys and three types of informal surveillance – surveillance by residents, street lighting, and public surveillance.

1. INTERCONNECTED ALLEYS:

Alleys that are connected to other alleys can create strategic spots for crime, providing hiding places for criminals and escape routes hard for the police to reach. In contrast with dead-ends and closed alleyways they may reduce the risks faced by murderers in the Alto Vera Cruz favela.

In this study, alleys function as crime facilitators. According to Clarke and Eck, 2005, crime facilitators are any social, physical or chemical factors that “help offenders commit crimes or acts of disorder” (Clarke and Eck, 2005:Step30). Interconnected alleys are an example of physical crime facilitators, increasing the “offender's capabilities to overcome prevention measures.” (Clarke and Eck, 2005:Step30).

For the police, the Alto Vera Cruz favela alleys, usually interconnected, and characterized by irregular design, with sharp, unpredictable bends and

intersections, make patrolling harder and render their officers vulnerable to criminal ambush. At the same time, from the perpetrators' perspective, these alleys make it easy for offenders to surprise their victims and subsequently escape.

In this study, field observation covers interconnected alleys located at a distance of less than 15 meters from the control and homicide addresses. The photos below illustrate some examples of alleys in the AVC favela.



Photo 6



Photo 7



Photo 8

2. INFORMAL SURVEILLANCE MECHANISMS

Informal surveillance is part of the concept of “capable guardians” defined by the Routine Activity theory (Cohen and Felson, 1979) – and refers to someone

or something that prevents the occurrence of crime. As previously mentioned, according to this approach, the absence of capable guardians (e.g., formal and informal surveillance mechanisms, parents, and others) is one of the three major elements (along with a motivated offender, and a suitable victim) that must converge at the same time and place for a crime to occur (Felson, 2002).

In addition, informal surveillance mechanisms are considered to be key crime prevention measures, featured among the Twenty-five Techniques of Situational Crime Prevention (Clarke and Eck, 2005). Formal surveillance (e.g., security guards, burglar alarms, speed cameras), natural surveillance (e.g., street lighting, defensible space, and neighborhood watches) and surveillance by employees (park attendants, surveillance of pay phone locations, CCTV) increase the risk involved in the commission of crime by changing the prospective offenders' perception of the costs and benefits of their criminal act. While they do not directly stop crime from occurring, as argued by Painter and Tilley (1999) these factors signal to motivated offenders that *"they can be observed (even if they are not), they may be less likely to offend, given the increased potential for intervention, apprehension, and prosecution"* (Cozens, 2008:163).

Natural surveillance also forms part of crime prevention mechanisms, as suggested by the concepts of Defensible Space by Oscar Newman (1973) and the Crime Prevention through Environmental Design (CPTED) approach put forth by C. Ray Jeffery (1971). According to the Defensible Space approach, natural

surveillance refers to “*the capacity of physical design to provide surveillance opportunities for residents and their agents*” (Cozen, 2008: 160).

Kruger *et al.*, (2001) also distinguish between two types of surveillance: passive and active. The former is defined as “*the casual observance of public and private areas by users or residents in the course of their normal activities*” while the latter “*refers to surveillance by police or other agents whose express function is to “police” an area*” (Kruger *et al.*, 2001:33). Prime examples of natural surveillance are windows and physical design features that increase visibility providing feasible lines of sight for residents to keep their eyes on the street (Cozens 2008; Kruger *et al.*, 2001).

In this study, there are three types of informal surveillance: surveillance by residents, public lighting and public surveillance. Each one is discussed below.

2.1. SURVEILLANCE BY RESIDENTS:

Surveillance by residents is measured by taking into account the presence of a home’s front windows that afford clear visibility of streets and alleys. The main idea is that homes with front windows looking directly onto the street (in contrast to windows obscured by any type of barrier such as bars, high walls, or windows in two storey houses that are set back in balconies) may help deter offenders from committing crime. Residents may be able to recognize the offenders and intervene, calling the police.

The photos below show some examples of different types of home's front windows in the AVC favela.



Photo 9



Photo 10



Photo 11



Photo 12

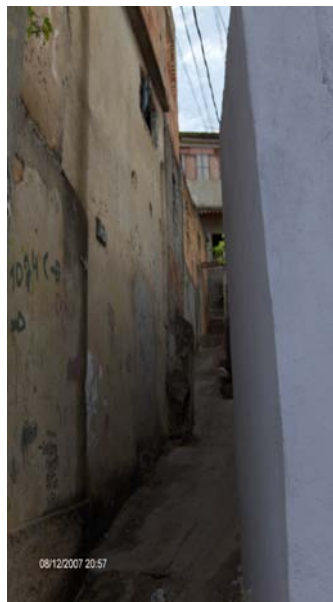


Photo 13



Photo 14

2.2. STREET LIGHTING:

Well lit streets may deter offenders who are more likely to commit crime in locales that are dark. However it is important to bear in mind that improved street lighting may have different effects on crime as stated by Professor Pease, 1999. On one hand, it may reduce crime because (1) offenders might be recognized and caught as they are committing a crime; (2) police become more visible, thus increasing the risk for offenders and leading to criminal desistance; (3) informal surveillance increases by the presence of local residents who are encouraged to spend more time in front of their houses in the evenings, or by people who become less afraid to walk on streets at night (see Clarke, 2008:6.)

On the other hand, Pease, 1999, states that improved street lighting can also facilitate crime, for example, increasing burglary (as more houses are unoccupied due to the fact that more people are involved in outside social activities in the evenings), and other types of crime such as drug dealing, and prostitution. In addition, well lit street can attract disorderly youths from nearby areas and can also make rarely used footpaths potential spots for undesirable behavior. Additionally, street lighting increases the visibility of a potential target from the offenders' point of view, thus increasing the ability of offender's assessment of the target vulnerability and value. Furthermore, well lit streets make capable guardians visible, thus helping offenders to assess the risk of committing a crime.

Despite the diverse impact improved street lighting can have on criminal behavior, it is considered a situational crime prevention measure, reducing the opportunities for crime, and strengthening informal social control and community cohesion. According to Clarke (2008), two theories underline Professor Ken Pease's ideas about the relevance of street lighting on crime. These are:

1. "Street lighting is a situational crime-prevention measure that focuses on reducing opportunity and increasing risk through modification of the physical environment.
2. Street lighting strengthens informal social control and community cohesion through the promotion of social interaction and investment in neighborhood infrastructure" (Clarke, 2008:7).

In this study, street lighting is measured by the presence of lampposts in the observed addresses. Photos below illustrate street lighting in the AVC favela.



Photo 15



Photo 16



Photo 17

2.3. PUBLIC SURVEILLANCE:

Public surveillance like other types of informal surveillance enhances the possibility that eyewitnesses will see crimes being committed, thus augmenting the risk for offenders. Public surveillance is measured by the presence of the following situational attributes: (1) bus stops, (2) public phones, (3) stores and (4) high vehicular traffic. Streets that are classified with high vehicular traffic are those in which the flow of cars and buses are intense. The photo 1 below illustrates a high vehicular traffic street while the photo 2 illustrates a low vehicular traffic street in the AVC favela.



Photo 18: High vehicular traffic St.



Photo 19: Low vehicular traffic St.

Bus stops and public phones are usually placed in settings where there is a concentration of people. Places where there are stores are often busy spots, characterized by the movement of pedestrians shopping, coming and going. In addition, it is assumed that in streets where car and bus traffic is intense, the risk of committing a crime might be higher due to the large number of eyewitnesses in transit, in contrast to local or dead-end streets and alleys where there is less pedestrian and vehicular traffic.

The table in the next page summarizes the main independent variables in the current study:

TABLE 6: MAIN INDEPENDENT VARIABLES AND ITS FUNCTION, ATTRIBUTES AND THEORETICAL FRAMEWORK			
INDEPENDENT VARIABLES	FUNCTION	ATTRIBUTES	THEORETICAL FRAMEWORK
I. Convergence variables	<u>Crime Attractors:</u> Facilitate victim-murderer encounters, thus reducing offenders' efforts in committing homicides.	1. Drug areas. 2. Bars.	Crime Pattern Theory and Routine Activity Approach
II. Commission variables	<u>Crime Facilitators:</u> Make the commission of crime easier, providing escape routes and hiding places for offenders.	3. Alleys.	Rational Choice Perspective, Situational Crime Prevention Approach, Defensible Space and CPTED concepts
	<u>Absence of capable guardians:</u> Reduces the risk for individuals with disposition to kill, imposing obstacles to informal surveillance mechanisms.	4. A home's front windows with visibility onto streets. 5. Street lighting. 6. Stores. 7. Public phones. 8. Bus stops. 9. Vehicular traffic.	

In order to collect detailed information on the independent variables as described above, a systematic field observation was conducted at 100 homicide

addresses, as well as at 100 addresses free of homicides in the Alto Vera Cruz favela. The following section discusses the data collection process.

7.5. SYSTEMATIC OBSERVATION OF INDEPENDENT VARIABLES

Systematic and direct observation of independent variables and their attributes in the Alto Vera Cruz favela were performed between September and December, 2007. This required the use of a structured environmental survey protocol to help to assess the main characteristics of the specific situational factors of homicide and control addresses, thus guaranteeing as much objectivity as possible in the collection and recording of information. A structured environmental survey protocol or check-list with closed-ended units of observation was thus developed for the data collection. In this protocol, the independent variables – all nominal variables, are dichotomous – each variable has a zero value in the absence of the observed units, or a value of one in the presence of the observed attributes. The first idea was to develop a protocol that covered not only information on the main variables but also on various physical features of the observed addresses. A model of this pilot protocol is provided in Annex 1. This protocol was then tested in the field. It was concluded that the protocol was too broad and some changes had to be made in order to render it more accurate and confine it only to the collection of the main variables. A new design of the protocol was created with the objective of reducing the number of

variables, adjusting it to the sample size, and using measures that were more consistent with environmental concepts that guide the design of this current study. An example of this protocol is shown in Annex 2.

Along with developing the protocol, the following additional procedures were established in order to conduct field observation:

- 1) Data collection was performed by the researcher, who was accompanied by a key informant from the Alto Vera Cruz favela. This informant, who lives and works in the favela under study, was found through the Alto Vera Cruz Cultural Center. As a local school teacher involved in cultural activities such as community-theater, this informant is not only known to many residents, he is also familiar with the geography and social dynamics of the streets. Accompanied by this informant, the researcher was able to circulate through the favela without being singled out as a total outsider; in addition, this informant helped the researcher find the selected addresses, many of them in hard-to-reach places, and facilitated the researcher's access to areas considered dangerous, such as drug-selling spots.

- 2) Observation was conducted on Thursdays, Fridays, and Saturdays between 5:00 p.m. and 7:30 p.m., and on Sundays between 10 a.m. and 2 p.m. Although the selected observation hours did not coincide with the

temporal patterns of the homicides (which could lead to temporal bias), they were hours during which there were more people in the streets, walking home from work or school, shopping, hanging out, or having fun in bars, particularly on the weekends. For this reason, it was safer for the researcher and her assistant to conduct the field observation during those hours.

3) To support the analysis, detailed documentation of the characteristics of the main variables was recorded through color photos. A total of 927 photos were taken (see in Annex 2 a series of photos of homicide and control addresses followed by a briefly synopsis of the crime scene based on Police Inquiries).

The use of the protocol and procedures described above, aimed at making the data collection process systematic and feasible during field observation, did not, however, eliminate all challenges and difficulties faced by the researcher in measuring situational factors. These issues are addressed in the following section.

7.6. CHALLENGES OF CONDUCTING SYSTEMATIC OBSERVATION IN THE ALTO VERA CRUZ FAVELA

Systematic observation of situational factors in the Alto Vera Cruz favela was conducted between September and December, 2007, as previously stated and last for 30 days. The researcher's schedule had to be adjusted to the availability of her assistant, making it difficult at times to conduct the observation in a sequential period of time.

Observation of each address, which included filling the protocol form, writing notes, and taking pictures, took about 15-20 minutes. Since such activity was unusual and out of the ordinary in the favela, it attracted attention, especially from drug traffic lookouts, who considered the behavior suspicious.

One of the main challenges of this study lies in the favela's social-geography itself. The Alto Vera Cruz favela is a heavily populated neighborhood comprised of various turfs presided over by diverse drug-trafficking-groups. On account of this, it is not only the drug-dealers' lookouts, but also concerned residents who seemed to keep their eyes active on streets and alleys, especially in the presence of an outsider. There were many situations in which such individuals tried to warn the researcher about her inappropriate behavior, which could lead to troublesome situations with drug-dealers, putting her safety at risk. For example:

Example 1: September, , 2007, Thursday afternoon, around 4:30pm:

The researcher, walking with her camera in one of the major commercial streets in the favela, was approached by the owner of a store that sells construction supplies. The man, who was by the store's front door, left his place, came up to the researcher on the street, and discretely questioned and warned her: *"What are you doing? Are you taking pictures? You have to be very careful because there are drug-dealers look-outs everywhere. They are probably watching you."*

Example 2: September, , 2007, Friday evening:

The researcher was taking photographs of a homicide address near a bar. Two male adults who were in front of another bar across the observed address walked in her direction. With their drinking-glasses in hand, they approached the researcher and advised her that she could not take photographs of people. They mentioned that there was a guy inside the bar who was wanted by the police and they did not want any problems with the police.

Example 3: September, , 2007, Saturday, 5:30pm:

The researcher was discretely trying to take a picture of a homicide address adjacent to a street corner at which a guy was selling drugs to

people in cars, when the security guard of a Municipal building – a cultural center for local adolescents and children – located across the observed address, suddenly arrived and stopped the researcher from taking photographs, warning that she could be noticed by drug-dealers and find herself in danger.

Example 4: October, , Saturday afternoon:

The researcher and her assistant were walking in a location at the intersection of three interconnected alleys in an area known as a drug-trafficking area. Some guys, who where sitting on an alley path by a lamppost, called out to the researcher's assistant: *“you’re not showing her our routes, are you?”*

These examples reveal some of the difficulties in conducting direct observation of situational factors in an area where illegal activities are part of the dynamics of social life. These challenges made field observation an adventure throughout the favela, arousing felling of fear and frustration in the researcher. As a result, the observation data collection and documentation was conducted as discretely as possible, so as to prevent curious residents, and especially drug traffic lookouts, from interfering. Therefore, certain procedures were followed, such as:

- 1) When questioned, the researcher told residents her research related to school work about urbanization in the Alto Vera Cruz favela, deflecting suspicion that she was working for the police.
- 2) When walking around, the camera was hidden in a pocketbook.
- 3) Photos were taken from a distance, to avoid arousing suspicion by getting closer.
- 4) The researcher avoided taking notes right at the observed address – instead recording them at a safe distance – away from the people present at the moment.

Despite of these measures, while walking through the favela, the researcher was sometimes unexpectedly accosted by suspicious and intimidating young males, probably drug-dealers lookouts, who questioned and threatened her, preventing her from taking photos. To avoid attracting their attention further, all addresses in drug-trafficking areas were photographed from a distance. Since the camera was not appropriate for long-distance photos, detailed documentation of the addresses was compromised. In addition, some addresses in locales where there was active drug-trafficking, or where suspicious young males were hanging out were not photographed.

Additionally another challenge in conducting systematic observation in the Alto Vera Cruz favela was that some of the observed addresses were extremely difficult to find, especially the ones located in alleys, many of which have no signs to help identification. Those addresses were found with guidance from favela dwellers and the researcher's assistant.

Lastly, in addition to the difficulties just described, this study presents certain limitations with respect to the measurement of some of the variables, as discussed below.

7.7. DIFFICULTIES IN MEASURING SITUATIONAL FACTORS

The main problem relating to the measurement of situational factors involves the gap between the temporal patterns of homicides and the time at which the field observation was carried out. Although the field observation was conducted on weekends – days when homicide is more likely to occur, it could not be carried out late at night and in the early morning, during the hours when most homicides occur. Conducting observation during both daylight hours and nighttime would have increased the validity of the collected data; however, it was too dangerous to do so.

Additional difficulties in the measurement of some variables are due to the fact that situational opportunities for homicides are susceptible to variations in time (time and day of the week) and in people's routine activities. For example:

1. **THE RELATION BETWEEN PUBLIC SURVEILLANCE AND THE RISK FOR OFFENDERS IN COMMITTING HOMICIDES.** Public surveillance varies according to the time and day of the week, since the presence of people in public spaces tends to shift according to their everyday routines, as they spend time in outside social activities - going to school and work, shopping, and entertainment. Therefore, measuring public surveillance in terms of the locations where it is reasonable to expect greater circulation of people, such as at bus stops, public phones and stores, at times other than those during which homicides tend to occur does not seem to help in the analysis of the direct effect that public surveillance has on homicides. Even so, the measurement of these variables on Sundays (between 10:00 a.m. and 2:00 p.m.), and Thursdays, Fridays and Saturdays (between 5:00 p.m. and 7:00 p.m.) – times that may pose increased risk for offenders in committing homicides, given that there is a greater concentration of people in public spaces may suggest how and why homicides do not tend to occur at those times. The photos below illustrates signs of public surveillance on streets characterized by the movement of pedestrians and car vehicles:



Photo 20: Commercial stores



Photo 21: Bus stop



Photo 22: Public phone

2. **RELATION BETWEEN PUBLIC SURVEILLANCE MEASURED BY VOLUME OF VEHICULAR TRAFFIC AND OPPORTUNITIES FOR HOMICIDES.**

The mere fact that an observed address is located on some local paved street where vehicles can circulate does not mean that it is the object of public surveillance *per se*. The issue is that some of the streets in the favela are characterized by very low vehicular traffic. Furthermore, even though it can be assumed that main local streets have a more intense flow of vehicular traffic, the intensity fluctuates over time.

3. **THE LINK BETWEEN BARS AND OPPORTUNITIES FOR HOMICIDES.** Merely noting the presence of bars, without taking into account their business hours, and the existence of any type of controlling mechanism to deter deviant behavior, seems

to reduce the validity of the analysis of the role bars as facilitators of encounters between victims and offenders. In addition, although bars are usually open between 5:00 a.m. and 10:00 p.m., actual closing times vary according to the flow of people and other unpredictable circumstances. As a result, merely counting the presence of bars may not explain their direct and causal effect on creating opportunities for homicides.

The photos below and in the next page illustrate different types of bars in the AVC favela.



Photo 23



Photo 24



Photo 25



Photo 26



Photo 27



Photo 28

4. **THE RELATIONSHIP BETWEEN DRUG SELLING SPOTS, DRUG GANG AREAS AND HOMICIDE RISK.** Drug trafficking activity is a very discreet activity, and its rhythm changes over time, depending on its location and the time of day. According to the police as well as convicted murderers, drug activity begins around 11:00 a.m. and ends late at night – around midnight – in the Alto Vera Cruz favela. However, it is more intense during the night, when it is concentrated on street corners easily accessed by cars and other vehicular traffic. Nevertheless, it is possible to observe some discreet drug trafficking during the day, especially in alleyways, and in the interior of the favela. Even though drug selling or gathering of gang members may be known to occur at a selected address, those activities cannot always be detected. This necessitates that information be obtained from the

police, or even from offenders, or from members of the community in which drug-trafficking flourish.

5. **THE RELATION BETWEEN STREET LIGHTING AND HOMICIDE.** It was difficult to assess the impact of street lighting on homicide risk by merely counting the number of lampposts during field observation. Although most of the favela seems to be equipped with lampposts, this does not imply that they play an effective role in crime reduction, or that they were functioning adequately at the time and place where homicides occurred. This type of analysis requires a distinct and deeper study of the adequacy of public lighting, which is not the purpose of the present project.

It is also important to highlight that certain situational factors in the selected addresses were easier to measure through direct field observation than others. For example, the presence of street-facing windows in residences as also, the presence of alleys in the favela, were more easily measured than the evidence of drug-trafficking spots. Also in certain circumstances, in order to identify whether an alley was an interconnected one or a dead end, the information could be checked against a map of the favela; in other cases, the researcher had to walk to the end of long and intricate alleyways, or obtain information from a passerby.

In view of the methodological problems discussed above, variables were classified according to the level of difficulty in measuring them. Variables classified as situational factors with low measuring difficulty included, for example, the characteristics of selected addresses which are easily ascertained through direct observation. Variables that depend on additional data sources were classified as situational factors with moderate measuring difficulty. Finally, variables with high measuring difficulty are those which may appear easily tackled through direct observation, yet whose possible effects on reducing the risks of homicides seem to be more susceptible to day and time variation, thus necessitating a deeper analysis. The following table depicts the classification of measurement difficulty for independent variables:

TABLE 7: CLASSIFICATION OF MEASUREMENT DIFFICULTY FOR SITUATIONAL FACTORS

MEASUREMENT DIFFICULTY	SITUATIONAL FACTORS
Low	<ul style="list-style-type: none"> • Home's front window. • Bars. • Stores. • Public phones. • Bus stops.
MODERATE	<ul style="list-style-type: none"> • Drug-selling spots. • Gang-related-drug areas. • Interconnected alleys. • Vehicular traffic
HIGH	<ul style="list-style-type: none"> • Street lighting

In sum, one of the limitations of this study is the risk of the research findings being compromised by the measurement of certain variables without

factoring temporal variation of the homicide patterns into the calculation of the correlation between situational factors and crime occurrence. In order to minimize this problem, four measures were taken as follows:

- 1) Eliminating street lighting as a variable, due to measurement difficulties related to assessment of its impact on homicide reduction and its susceptibility to time variation.
- 2) Eliminating public phones and bus stops as indicators of public surveillance. Most homicides occurred late at night, during times in when it is expected that there will be lower number of people at bus stops, or using public phones.
- 3) Measuring the presence of stores and vehicular traffic (indicators of public surveillance) based on the time at which homicide occurred.
- 4) Measuring the effectiveness of a home's front windows (main indicator of surveillance by residents) based on the time at which homicide occurred, and taking into consideration the temporal patterns of routine activities of residents.

Furthermore, to increase the accuracy and validity of measurements, this study uses information obtained from police homicide reports. In this way, information from the crime scene, recorded on the day and time the crime was committed, can be compared to field work results, resulting in more valid data.

The table in the next page summarizes the results of the process undertaken to overcome measurement difficulties:

TABLE 8: RESULTS OF THE PROCESS UNDERTAKEN TO OVERCOME MEASUREMENT DIFFICULTIES

MAIN PREDICTOR VARIABLES PRIOR FIELD OBSERVATION	DROPPED PREDICTOR VARIABLES AFTER FIELD OBSERVATION	PREDICTOR VARIABLES ADJUSTED BY HOMICIDE TIME	REMAINING PREDICTOR VARIABLES AFTER FIELD OBSERVATION
1. Drug areas			YES
2. Bars			YES
3. Interconnected alleys			YES
4. Home's front windows		YES	YES
5. Public phones	YES		
6. Bus stops	YES		
7. Stores		YES	YES
8. Vehicular traffic		YES	YES
9. Street lighting	YES		

In order to complement this section, the Annex 2 presents a set of photos illustrating features of homicide addresses and their corresponding control addresses. It also provides a synopsis on each homicide case based on police inquiries.

7.8. STATISTICAL ANALYSIS AND FINDINGS

This section describes and discusses the statistical analysis and findings with respect to the matched case-control study. It starts with a descriptive bivariate analysis of the data and the results of a McNemar's test. It also shows the results of a conditional logistic regression model using spatial lags in order to control for spatial autocorrelation.

7.8.1. DESCRIPTIVE ANALYSIS OF 100 PAIRS OF MATCHED HOMICIDE AND CONTROL ADDRESSES IN THE AVC FAVELA

A descriptive analysis of homicide data was performed in SPSS using two related samples of 100 pairs of matched homicide and control addresses. The variables are nominal and dichotomous as explained previously (Chapter 5). The table below displays each variable analyzed in this study and its corresponding measurement.

TABLE 9: CLASSIFICATION OF MAIN VARIABLES AND THEIR MEASUREMENTS	
NOMINAL VARIABLES	MEASUREMENTS
1. Drug area	Presence of drug selling spot or drug-related gang area.
2. Interconnected alleys	Presence of alleys connected to another alleys or streets.
3. Bars	Presence of alcoholic establishments.
4. Surveillance by residents	Presence of home's front windows that afford clear visibility of streets or alleys.
5. Public surveillance	Intense vehicular traffic and presence of commercial stores.

It is important to highlight that the measurement of surveillance by residents take into consideration the time at which homicide occurred and the temporal patterns of routine activities of residents.

Surveillance by residents is classified as low or high. Observed addresses with low surveillance by residents are those in which home's front windows are blocked by bars, walls or other obstacles. In addition, observed addresses with low surveillance by residents include those addresses in which homicide occurred between 10:00 p.m. and 6:00 a.m. – times in which the surveillance by residents is probably very low.

Regarding to public surveillance it is measured by the presence of intense flow of vehicular traffic and commercial stores, taking into consideration the temporal patterns of homicides.

Public surveillance is classified as low and high. Low public surveillance refers to observed addresses in which the traffic of vehicles is reduced or inexistent and there is none commercial establishment. Observed addresses in which the traffic of vehicles is intense and there are commercial establishments but in which homicide occurred after 10:00 p.m. are classified as with low public surveillance. Commercial stores in the AVC favela usually close between 7:00 p.m. and 8:00 p.m. and probably the traffic of buses and cars is significantly reduced after 10:00 p.m.

The table on the next page displays the binary percentage of 100 homicide addresses and 100 matched control addresses at each level of each

situational variable being investigated. These results are displayed for descriptive purposes and are not used for calculating significance levels.

TABLE 10: PERCENTAGE DISTRIBUTIONS OF SITUATIONAL VARIABLES IN 100 PAIRS OF MATCHED HOMICIDE AND CONTROL ADDRESSES IN THE FAVELA (N = 100 PAIRS OF OBSERVED ADDRESSES)		
TYPE OF SITUATIONAL VARIABLES	HOMICIDE ADDRESSES %	CONTROL ADDRESSES %
LOCATED IN DRUG AREAS OR NEAR DRUG SPOTS	94.0	33.0
NEAR BARS	48.0	22.0
ADJACENT INTERCONNECTED ALLEYS	74.0	26.0
LOCATED IN ADDRESS THAT AFFORD HIGH SURVEILLANCE BY RESIDENTS MEASURED BY HOME'S FRONT WINDOWS WITH CLEAR VISIBILITY OF STREETS AND ALLEYS*	13.0	40.0
LOCATED IN ADDRESS THAT AFFORD HIGH PUBLIC SURVEILLANCE MEASURED BY HIGH VEHICULAR TRAFFIC AND PRESENCE OF COMMERCIAL STORES*	15.0	43.0

*variables are adjusted by the time at which homicide occurred.

Data source: Systematic observation of 100 homicide and 100 corresponding control addresses conducted in the favela, between September and December, 2007.

Table 10 shows that the percentage of homicide addresses located in drug areas are very high (94%) while the percentage of control addresses located in similar areas is low (32%). In addition, the percentage for observed homicide addresses located near interconnected alleys is 74%, higher than control addresses that present a percentage of 26%.

Furthermore, the table displays lower percentage for homicide addresses when surveillance mechanisms were taken into account. For example, the percentage of homicide addresses in which public surveillance was observed is 15%, while the percentage of control addresses is 43%. Additionally, the percentage of homicide addresses in which surveillance by residents was observed is very low (13%), while the percentage of control addresses is very high (40%). These results indicate variation between situational features of homicide and control addresses. In order to test whether this variation is significant, the McNemar's test is performed as shown in the next section.

7.8.2. ANALYZING McNEMAR'S TEST

The McNemar's test is a non-parametric statistic which allows the consideration of hypotheses that have a categorical (nominal) dependent variable (Black, R.T., 1999). It is appropriate for assessing difference of proportions on matched pairs of two related samples. In this study, the McNemar's test is used to assess whether or not a particular situational factor

(predictor variable) has a significant effect on paired samples of matched homicide and control addresses (outcome).

In order to carry out a McNemar's test, the data, which is comprised of 100 pairs of homicide and control addresses, is arranged at the levels of each predictor or situational variable, in square tables with dichotomous variables as table 11 below:

**TABLE 11: DISPLAY OF VARIABLES TO CARRY OUT
MCNEMAR'S TEST**

Control address	Homicide address	
	Exposed	Not exposed
Exposed	A	B
Not exposed	C	D

The McNemar's test assumes that the total number of rows ($a+b$) is equal to the total number of columns ($c+d$). This means that the proportion of situational variables in homicide addresses is the same as the proportion of situational variables in their corresponding control addresses. Thus, it assumes that the mean of paired samples is equal. Based on this assumption, the null hypothesis in this study assumes that the proportion of situational factors in homicide addresses is the same as the proportion of situational variables in their corresponding control addresses. In this way, none of the situational variables being studied has any effect on homicides in the observed addresses.

On the other hand, the alternative hypothesis assumes that the sum of the rows is not equal to the sum of the columns. This means that the proportion of

situational variables in homicide addresses is not the same as the proportion of situational variables in their corresponding addresses. Thus, the mean of the paired samples is not equal. In this study, the alternative hypothesis assumes that each situational factor has an impact on homicides in the observed addresses. The McNemar's test is computed in SPSS using the following formula:

$$X^2 = (c - b)^2 / c + b$$

Results of the McNemar's test shows the *P value* (the significance value of the null hypothesis), by using the chi-square distribution based on 1 degree of freedom. The chi-square is computed using the formula below:

$$X^2 = \frac{([b - c] - 1)^2}{(b + c)}$$

In the current study, the formula above uses discordant pairs, that is, the number of pairs for which addresses free of homicides were exposed to the risk factor – the situational variables – while the homicide addresses were not, and, inversely, the number of pairs where homicide addresses were exposed to the risk factor while the addresses free of homicide were not.

The McNemar's chi-square test is computed using SPSS software. Its results are displayed in the table in the next page.

TABLE 12: RESULTS OF THE McNEMAR'S TEST (N = 100 PAIRS OF MATCHED HOMICIDE AND CONTROL ADDRESSES IN THE AVC FAVELA, BRAZIL)		
Predictor variables	Chi-square	<i>P value</i>
1. Drug areas	60.016	,000*
2. Bars	14,205	,000*
3. Connected alleys	39,446	,000*
4. Public surveillance	22,781	,000*
5. Surveillance by residents	19,314	,000*

Data source: Systematic observation of addresses in the Alto Vera Cruz favela, Belo Horizonte, Brazil, between September and December, 2007.

* *P value* is significant at 5% level or p value < 0.05

The table above shows the significance value for McNemar's test. These results help to determine whether or not there is strong evidence against the null hypothesis. As shown in the table, the McNemar's test is significant at a 5% level for each predictor or situational variable being studied. It suggests that there is a statistically significant difference in the proportion of each situational variable under analysis in homicide addresses, and the percentage of each situational variable in the corresponding control addresses. This indicates that there is an association between situational variables and homicides.

7.8.3. CONDITIONAL LOGISTIC REGRESSION ANALYSIS

The conditional logistic regression analysis is an extension of the McNemar's test and is used to examine the relationship between a binary

dichotomous dependent variable and a set of predictor variables in matched case-control studies (Hosmer and Lemeshow, 2000.) The binary response is coded as 1 (case) or (control).

Conditional logistic regression, unlike the standard logistic regression models, does not assume that observations are independent since its main requirement is that observations are matched or grouped in some way. When matched pairs are included in the model, the unit of observation in each matched pair “is not two independent cases but the difference between the two cases within each pair” (Menard, 2010:246.) Inclusion of matched case-control samples violates the assumption of standardized logistic regression models that “probability of selection of one case is independent of the selection of any other case,” and also, “the assumption of a single observation per case” (Menard, 2010:245.)

In this study, conditional logistic regression is used to investigate the significance of various situational factors possibly related to opportunities for homicides in the favela. Although the value of the Moran's I test suggest a weak spatial autocorrelation among homicide locations, the spatial dependency is taken into consideration by incorporating spatial lag of homicide and control addresses.

The conditional logistic model is performed in the SPSS software through which a multinomial logistic regression is computed based on differences

between matched pairs of homicide and control addresses for each situational variable.

The results of the conditional logistic regression analysis controlling for spatial autocorrelation show how significant the chances are of homicides occurring in the presence of predictive situational factors as they are displayed in the table below.

TABLE 13: RESULTS OF THE CONDITIONAL LOGISTIC REGRESSION ANALYSIS CONTROLLING FOR SPATIAL AUTOCORRELATION (N= 100 pairs of matched homicide-control addresses in the AVC favela, Brazil)			
SITUATIONAL VARIABLES	REGRESSION COEFFICIENTS (B)	P VALUE	ODDS RATIO EXP (B) (95% CONFIDENCE INTERVAL)
1. Drug areas	4.076	.007*	58.924
2. Bars	3.979	.004*	53.480
3. Connected alleys	3.234	.018*	25.392
4. Public surveillance	-3.847	.025*	.021
5. Surveillance by residents	-2.749	.034*	.064
6. Spatial lags	.961	.548	2.616

* *P value* is significant at 5% level or *p value* < 0.05

Interpreting the *p values* shown in the table above leads us to infer that the association between situational variables and homicides is not likely due to chance; instead, there is a higher probability that situational factors play a relevant role in creating opportunities for homicides. In the conditional logistic

regression model, the interpretation of the logistic regression coefficients (B) gives the conditional odds ratio (Knobe, D. and Bohrnstedt, G.W. 1991) In this study, the odds ratio calculates the chances of observing cases (e.g., homicide addresses) that are exposed to risk factors, over the chances of observing control cases (e.g., addresses free of homicides) that are exposed to the same factors for each pair of case-control individually.

7.8.4. FINDINGS AND INTERPRETATION

The conditional logistic regression model, which takes spatial lags into account, show that situational variables, rather than spatial autocorrelation component of homicide data, play a relevant role in explaining the occurrence of homicides in certain locations. The values of spatial lags were not significant at p value less than 0.05. The results suggest that the chances of homicides occurring in certain addresses in the AVC favela are due to characteristics of these locations rather than the incidence of homicides in nearby locations.

The findings suggest that the chances of homicides occurring in addresses located in drug areas are very high, - at p value less than 0.05: about 58 times higher than in addresses not located in drug areas.

In addition, the chances of homicides occurring in addresses located near bars are significant (p value less than 0.05). The odds ratio indicates that the

chances of homicides occurring near bars are more than 53 times higher than in addresses far away from bars.

The odds ratio also suggests that the relative risk of homicides is over 25 times higher (at p value less than 0.05) in addresses located near connected alleys than in addresses far from alleys or dead ends and closed alleys.

As for areas with public surveillance, the results suggest that at addresses where watchful eyes are more prevalent, the association between this variable and homicides (p value less than 0.05) is over 3 times lower than in addresses in which public surveillance is reduced.

Finally, the results suggest that at addresses where there are homes with front windows offering clear vision to streets and/or alleys, the relative risk of homicides is more than 2 times lower (p value less than 0.05) than in locations where surveillance by residents is limited.

In sum, the results presented here are of substantial import to the design of crime prevention policies incorporating situational variables as relevant crime reduction measures for homicides in the AVC favela.

7.8.5. ADDRESSING A PARADOX: THE RELEVANCE OF PUBLIC AND COMMUNITY SURVEILLANCE AS AN IMPORTANT SITUATIONAL CONSTRAINT ON HOMICIDES

This section seeks to address the theoretical paradox raised by the findings regarding public surveillance and surveillance by residents as important situational constraints on homicides in the AVC favela, an environment which criminals seem otherwise to control. Criminals, most of whom are young males and adolescents involved in local drug trafficking, are familiar faces in the streets and alleys of the favela. On any ordinary day, they blend in with passers-by. Some of them are drug-dealers' look-outs, keeping a watchful eye out for outsiders, the police or enemies. They can also be seen standing at the alleys' sharp curves, selling drugs to local buyers, or at strategically located streets, selling drugs to outsiders in cars. However, favela residents will tell you that sometimes, for example during gang wars, these criminals are seen in groups, running throughout the alleys, guns in hand, driving residents off the streets. Notwithstanding, criminals are bonded to the community through complex social relationships. On one hand, they employ threats and violence against those individuals who try to take action against their criminal activities. On the other hand, they may be relatives, neighbors or old acquaintances of some of the favela's residents. This familiarity, and the social bonds with criminals, seems to give rise to ambiguous feelings within the community: feelings of fear and

impotence, as well as feelings of esteem, because the criminals are also perceived as the easiest resource for the immediate needs of individuals within the community. Criminals can lend money and offer assistance as well as protection against robberies and rape within the favela. In such an environment, do murderers really care if there are witnesses when they commit their crimes?

From the theoretical standpoint, the importance of surveillance mechanisms in crime prevention and control has been upheld by many academics and experts within the discipline of Environmental Criminology. As stated by Felson “crime seeks places and times that are largely unsupervised” (Felson, 1997:79.) This essential idea is reinforced by the Rational Choice Perspective, which suggests that criminals make a judgment at the time of committing a crime; the possibility of getting away with impunity is judged to be higher in places where surveillance is limited.

The research findings in the present study corroborate the concept that surveillance mechanisms have a significant bearing on crime prevention and reduction. Analysis of 100 homicide cases in the AVC favela demonstrates that most homicides occur late at night and very early in the morning, times when surveillance by the public and residents is reduced. At these times, the number of potential witnesses on the streets, especially in commercial areas, is low on account of the decrease of vehicular traffic and pedestrian movement. At the same time, the guardianship of streets by residents also tends to be lower. As a result, the risk of criminals being caught is reduced. In addition, as the murderers

themselves say, potential victims tend to be more vulnerable late at night, times when they are likely to be without the protection of their allies. It is important to bear in mind that most of the victims share the same socio-demographic characteristics as their murderers; they are adolescents or young males who have been lifelong residents of the favela. They are known to one another and are involved in drug trafficking. As criminals report, late at night, when drug trafficking activities slow down, potential victims are shot when they are at their most vulnerable - usually alone, near bars, or walking through the alleys or streets on their way home.

It thus appears reasonably logical, from the offenders' point of view, that the commission of murders late at night is less risky due to the vulnerability of victims in the absence of surveillance mechanisms. It is also important to note that locales where surveillance by the public and residents are prevalent might be locales with extended guardianship of the streets by three different likely controllers - anonymous witnesses, victims' allies, and the police. The relevance of each one of these potential controllers on the offenders' risk calculus is explained below:

1) **Extended guardianship of streets by anonymous witnesses.** Streets where there is a concentrated flow of pedestrians and vehicular traffic, and where the front windows of residences offer clear visibility of streets and alleys tend to increase the possibility that anonymous witnesses might report illegal activities in

the streets, especially if a homicide is committed in public spaces. In such locales, criminals have less control over potential witnesses, many of whom may be traveling in cars or buses, going in and out of stores, or inside their homes without being noticed from outside. Thus, the risk of being caught is increased. The use of threats or violence against potential witnesses might be less effective due to the difficulty of the latter being identified by the offenders. Thus the relevance of public surveillance and surveillance by residents on homicides as indicated in this study might be explained by the role that they play on the offenders' cost-benefit equation, as it increases the chances of murderers being reported to the police by anonymous witnesses.

Furthermore, it is important to note that even in a violence-ridden favela such as the Alto Vera Cruz, where criminals seem to be in control, they cannot escape the presence of informants who keep the police abreast of the names of the main murder suspects. Although such information does not constitute sufficient evidence for the police to catch criminals, it helps the police strategically to intensify surveillance of certain individuals or groups. In addition, in such locales, offenders might also have to deal with the factor of extended guardianship of potential victims by their allies, which will be discussed next.

2) Extended guardianship of potential victims by their allies. Locales where surveillance by the public is prevalent might be also locales where potential victims are protected by an extended guardianship provided by their

allies who stand by on street corners, near bars, or who often hang out in groups throughout the main streets of the favela. In addition, during day times and evenings when drug trafficking is active, drug-dealers' look-outs blend in with passers-by in the most crowded streets of the favela, keeping alert for the arrival of enemies, i.e. rival gang members, thus providing protection to their allies. From the offenders' point of view, the commission of homicide in locales where the potential victim is probably protected by allies or where look-outs are more likely to be present is risky; they can be flushed out by rivals, and the chances of retaliation by their enemies are increased, rendering them vulnerable, in turn, as the next potential victim. They also incur the risk of being reported to the police.

3) Police surveillance. Locales where there is a concentrated flow of pedestrians and vehicular traffic, especially in commercial areas, are also places where there is greater supervision by the police. This is on account of the possibility of more conflicts and problems arising in such locales due to the concentration of people, as well as on account of easy access through the paved streets. Although the police rarely catch criminals red-handed, the fact that the police have easy access to certain places, even though they may arrive after the crime is committed, can play a role in the calculus of an offender's cost-benefit equation. More surveillance by the police in such areas, does not, however, always mean a significant increase in the risk of being caught.

The research findings of this study suggest that locales where surveillance by the public and residents is prevalent are locales where the potential risk for offenders is greater. A conjunction of elements intervene in the offenders' decision making process, such as (1) the possibility that anonymous witnesses might take action against them, (2) the chances of being pointed out by their enemies, enhancing the risk of retaliation as well as the risk of being caught and (3) increased surveillance by the police, as well as easy access to crime locations by the police. All these three elements increase the risks of crime by reducing the control that criminals seem to have in the favela.

OVERVIEW:

Chapter 7 describes the matched case-control study and its findings. It starts with an explanation of the main features of the case-control study. Next it discusses (1) the sampling process, (2) data, (3) the main variables, and (4) the main strategies in conducting a systematic observation of the independent variables in the favela. It also considers the main difficulties in measuring situational variables and the process of selecting the appropriate independent variables in this study. Furthermore, it presents a descriptive analysis of homicide data using two related samples of 100 pairs of matched homicide and control addresses. It goes on to discuss the results of the McNemar's test that is applied to assess whether or not a particular situational factor (predictor variable) has a significant effect on paired samples of matched homicides and control addresses

(outcome). Finally, the results of the matched-case control study are presented and interpreted.

PART 4

DISCUSSION AND POLICY IMPLICATIONS

8

SUMMARY AND DISCUSSION

This chapter starts with a summary of Part 3: Research Design and Findings. Next, it presents some theoretical and research strengths as well as methodological limitations of this study.

8.1. SUMMARY

The exploratory analysis of the distribution of homicides in the favela involves the use of spatial point pattern analysis techniques which focus on the spatial distribution of the locations where homicides were committed. It also provides information on the relationship between spatial patterns of homicide points and spatial patterns of two other geo-referenced situational variables, e.g., drug-trafficking locations and alleys. The point pattern analysis is applied because it permits investigating two main research questions in this study: First, why homicides occur in certain places in violence-ridden favelas; and second, do situational factors help to explain the distribution of homicides within the studied favela? The results of this analysis show that homicides are generally concentrated within two areas ruled by gangs involved in drug-trafficking, replete with alleys.

The table below summarizes each of the main spatial point pattern analysis techniques and its goals and findings, used in this study.

Table 14: Exploratory Analysis of Spatial Patterns of homicides: Goals and Findings

Point pattern analysis Techniques	Goals	Findings
Kernel density function	Identify hot spots of homicides in the AVC favela	Homicides are not homogeneously distributed within the favela. They are concentrated in two areas controlled by drug-trafficking gangs.
Ripley's function	Test for clustering	Homicide locations tend to be more clustered for distances greater than 65 meters.
K-12 function	1. Test for the relationship between homicide point pattern and drug-trafficking point pattern.	Homicide locations tend to occur close to drug-selling spot locations, especially when the distance between these events varies between 10 and 200 meters.
	2. Test for the relationship between homicide point pattern and alley point pattern.	Homicide locations tend to occur near to alley locations when the distance between these events are less than 150 meters.

The results in the above table suggest not only that homicides tend to be concentrated in certain locales within the studied favela but also that the concentration of homicides in certain locales might be correlated with immediate situational factors.

The analysis of homicide spatial patterns also includes an analysis of spatial dependency or spatial autocorrelation. Contrary to the point pattern

analysis, the spatial autocorrelation analysis examines the interdependency of homicides in adjacent locations due to underlying common features. As argued by Werneck, 2008, this is an important spatial statistic that helps to avoid unstable regression coefficients and unreliable estimates of confidence intervals and significance levels in the regression model. The spatial autocorrelation was estimated by using Moran's I statistic, which indicates the extent to which the occurrence of homicides in one location may be influenced by the occurrence of homicides in nearby locations. The Moran's I is equal to 0.1068, suggesting a minimal spatial autocorrelation. However, the regression model took the spatial dependency into consideration, controlling for spatial lag.

The findings of the matched case-control study of homicide demonstrate that situational factors play an important role in the risk of homicides in specific places. The results of the conditional logistic regression model controlling for spatial dependency showed that homicides occurring at certain addresses in the favela are not related to spatial dependency components as would be expected due to the lower value of the Moran's I statistic. Rather, the findings indicate that homicides tend to occur in specific places where situational factors (e.g., drug areas, interconnected alleys, bars, surveillance by residents and public surveillance) are present.

To sum up, the results of the spatial data analysis and the conditional logistic regression model corroborate the main hypotheses in this study, showing

that situational factors skew offender's judgment of the efforts and risks they may face before committing homicide.

These findings show that, despite some limitations, identifying, examining and intervening in situational factors to make the commission of murders riskier for potential offenders can help establish useful crime prevention policies, in addition to some other advantages that will be discussed in the next section of this chapter.

DISCUSSION:

8.2. RESEARCH AND THEORETICAL STRENGTHS OF THIS STUDY

The major theoretical contribution of this study is to show how a substantial body of scientific studies focusing on criminals' use of specific opportunities unique to their locations in order to commit crimes has benefited the field of Environmental Criminology. The study presents some advantages when compared with previous research on homicides in violence-ridden neighborhoods, in the following ways:

First, it provides a direct, structured observation of situational factors in the location where the crime occurred, along with a rare example of a case-control study on homicides where the cases in question are places rather than people. Exploring and comparing the opportunities criminals have to commit crime in certain places may contribute to a scientific understanding of the way features of

these places affect the way criminals think and plan to commit murder. It also enables a systematic discussion of the importance that contextual differences in opportunities have in causing some places to be more prone to violent crime than others. This study does not intend to provide a deterministic analysis of the environmental causes of a problem as complex as homicide, but instead tries to investigate situational factors that could intervene in offenders' cost-benefits calculus, making murders more likely to occur in certain places, and not others, in the context of a Brazilian favela.

Second, this study focuses on analyzing the homicide event itself, contrary to the typical analyses that investigate the "roots causes" of criminality based upon the links between criminal disposition, social control mechanisms and community dynamics. In this sense the study is concerned with the role that situational factors play in shaping criminal behavior, and in structuring opportunities for violence in certain places in a hot spot neighborhood.

Third, it includes an exploratory spatial analysis of the distribution pattern of homicides, underlining the importance of research findings that show the impact of situational factors on criminals' decisions to commit homicide. It is a rare study in Criminology that exhaustively analyzes the geographical dimension of homicide locations, while also incorporating spatial autocorrelation components in the conditional logistic regression model.

Fourth, this study conducts a micro-level of analysis of the circumstances surrounding specific homicides, through systematic observation, and by using a

structured protocol to provide detailed descriptions and quantitative measures of addresses where homicides were committed, as well as addresses where no homicides were committed. This guarantees as much objectivity as possible in the collection and recording of the information, increasing the reliability measurements. In this sense, the study differs substantially from previous research studies that rely heavily on meso and macro analysis using police and aggregated data, or situational factors corresponding to social features of individuals (e.g., offenders and victims).

Fifth, this study provides visual records of characteristics of the observed addresses through photographs, making it possible for more than one person to check on the results of the systematic observation of the observed addresses, thus facilitating reliability checks.

Sixth, it provides a basis for comparing situational factors and homicides in one favela with those same factors in other favelas from across Brazil, as well as in other countries. Such a comparison can help advance the research field in a complex problem such as homicides in impoverished hot spot communities.

Seventh, this research supports previous research findings that focus on the importance of places in the commission of crimes, highlighting the presence of bars, drug-areas, alleys and surveillance mechanisms, both by the public and by residents, as important indicators in an attempt to measure violence.

In sum, this matched case-control design on homicides offers alternative responses for violence in favelas, focusing on removing or reducing

environmental opportunities for crime as suggested by the Situational Crime Prevention model, thus expanding and complementing the current repertoire of crime prevention strategies.

8.3. METHODOLOGICAL LIMITATIONS OF THIS STUDY

The main methodological limitations of this study are:

First, this study uses a small sample that could lead to statistical validity problems, such as, for example, reducing the power of the statistical test. Power refers to the probability that the test will find a statistically significant (not due to chance) difference between groups when a difference really does exist, thus the researcher rejects the null hypothesis when necessary. Using an overly small sample can lead to a Type II Error that occurs when the researcher does not reject the null hypothesis when it is in fact false. One solution to the statistical power problem would be to increase the sample size. However, that could not be done in this study because the sample size includes the number of homicides with full information on addresses that occurred in a set period of time in the favela being studied. In order to reduce bias due to sample size, the number of independent variables (equal five, with one degree of freedom) is adequate to the total amount of 100 matched pairs of control and homicide addresses in this study.

The second problem is one of generalizing the findings to explain violence in another (different) favela. This study focuses heavily on the immediate situational factors in locations where homicides occurred in the Alto Vera Cruz favela. For this reason, the research findings cannot be generalized to explain the relevance of situational factors impacting murderers in other favelas that are homicide hotbeds. To better examine the relevance of environmental factors as they apply to the question of homicides in favelas, the development of a comparative study would be necessary to broaden the research.

Third, no reliability checks are used on observed variables. The fact that the observations were conducted exclusively by the researcher could lead to subjectivity bias in data collection, thus invalidating the findings. However, this problem could be controlled as the characteristics of observed addresses in the study were registered through photographs (927 photos were taken), making future reliability checks possible.

Fourth, this study analyzes situational factors which are only one aspect of the complex problem of homicide in favelas. Homicide, just as any other type of crime, is a social phenomenon that *“involves social relationships between offenders, victims, members of the criminal justice system, and the general public”* (Young, 1991 in Tilley, 2009:80.) From this standpoint, homicide can be explained by investigating the psychological and social roots that contribute to criminal disposition and behavior. There is a vast literature on criminality that seeks to explain why certain individuals commit crime, while others do not.

In this study, homicides are analyzed as a crime event based on opportunities that make it easier to be committed. The main focus is to explore locales in which homicide occurred. This study assumes that “individual behavior is a product of an interaction between the person and the setting” (Felson and Clarke, 1998, 1), and highlights one of the main principles of environmental criminology that “opportunity is the root cause of crime” (Felson, 2005). In sum, there are many ways to look at homicides. The situational factors explored in this study are only one of them.

Fifth, this study uses systematic observation, which is only one method of measuring situational factors. It may have some disadvantages in comparison with others. For example, offenders' self reporting provides practical details about how and why opportunities facilitate the commission of crime. In addition, interviews or focus groups with people who could estimate situational factors such as local residents and the police who patrol in the favela could broaden the investigation of situational factors and violence, thereby increasing the reliability of measurements. Analysis of photographs is another method of measuring situational factors that has rarely been explored.

Sixth, this study is susceptible to informational bias. This problem is mitigated by the fact that there were limited changes in the local environment during the period in which the homicide data was analyzed, thus reducing the possibility of data bias.

In sum, despite these methodological weaknesses, the main advantage of this study is to provide new hypotheses to be investigated more creatively. It will hopefully enhance the understanding of the clues that exist in local environments to indicate where the relative risk of homicide is greatest, and it may provide a repertoire of responses to control and prevent these crimes in the favela being studied.

OVERVIEW

Chapter 8 summarizes Part III and examines the theoretical and research strengths of this study as well as its main limitations.

9

Policy Implications

The findings presented in this study use conditional logistical analysis to provide empirical evidence showing the main situational factors that lead to homicides in the Alto Vera Cruz favela. The presence of bars, areas where drugs are bought and sold, along with adjacency to interconnected alleys and lack of surveillance by residents and the public, are all shown to be crucial elements that help lead criminals to commit homicide. In addition, a previous analysis of homicides in the favela shows that guns are the main instrument used in the majority of killings.

The policies presented in this part are tailored to address these situational risk factors, before the study goes on to recommend a range of opportunity-reduction measures. The core recommendation of these strategies is to intervene on immediate situational factors of crime settings that can be manipulated and changed, making it harder for offenders to commit murders. This approach follows environmental criminology's main assumption that offenders, like all human beings, are rational individuals. That is, someone about to commit homicide must reflect, even if just slightly, before acting, thinking about costs, efforts, and gains (Felson, 2005) even if just for an instant before acting. Based on this principle, the current policies provide several strategies intended to increase the risks and obstacles for offenders, shifting their perception on the costs and benefits of crime. These policies could add alternative responses to

criminal justice practitioners, community members and other stakeholders involved in the continuing effort to reduce violence in the Alto Vera Cruz favela.

The policy implications for homicide in the Alto Vera Cruz favela are based upon two of the five categories from the Twenty-five Situational Crime Prevention Techniques: increasing the obstacles and increasing the risks for offenders, based on the Rational Choice Approach.

Policies related to increasing obstacles for offenders include:

- (1) Access control of alleys, and
- (2) Monitor existing regulations on neighborhood bars more effectively and make regulations more restrictive, limiting the number of licensed bars and regulating the hours during which of bars can remain open to the public.

Policies related to increasing the risks for likely offenders combine:

- (1) Improvement of natural surveillance by residents by re-designing interconnected-alleys in which drug-trafficking groups are active, and
- (2) Strengthening formal surveillance through implementation of Closed Circuit Television (CCTV) over public spaces.

Each of these policies is illustrated in the following table:

TABLE 15: HOMICIDE PREVENTION POLICIES

HOMICIDE PREVENTION POLICIES BASED ON SITUATIONAL CRIME PREVENTION APPROACH	CHANGING OFFENDER'S COST- BENEFITS EQUATION	
	INCREASING THE EFFORTS	INCREASING THE RISKS
1. Access control through alley-gating.	+	
2. Cut off bars from attracting violence through: <ul style="list-style-type: none"> • Regulation • Control of the number of licensed bars • Curfew on alcohol sales and consumption in public places 	+	
3. Assist natural surveillance through urban planning and re-design of alley-settings in drug areas.		+
4. Strength formal surveillance through CCTV cameras strategically located and monitored by the police.		+

Each one of the homicide-reduction policies are discussed as follows:

9.1. ACCESS CONTROL THROUGH ALLEY-GATING:

This study recommends alley-gating as an effective response for homicide reduction in violent favelas, especially those with dead-end alleys. Closing alleys with gates imposes a physical barrier that stops offenders from running and hiding and from carrying out illegal activities. It also increases the sense of ownership that residents in alley-settings have over the common area, controlling behavior and activities that take place within the alleys.

This is not a new strategy. It is part of the CPTED techniques which tries to limit the opportunity for crime to flourish by manipulating the built environment (Jeffrey, 1972). Alley-gating has been implemented in England as an effective response to burglaries, as previous discussed in this study. This is not a new strategy in the Alto Vera Cruz favela either, where some dwellers have also closed alleys as a response against deviant behavior.

It is important to take into consideration favela residents' own perception regarding the effectiveness of alley-gating to prevent violence. Residents in seven alley-gated settings in the AVC favela said that closed alleys have positive effects on reducing violent acts and public disorder, adding that the closed alleys make residents feel safer. They estimate that shootings, misdemeanors related to drug use, vandalism and violence have diminished in their location since the implementation of gates.

The first alley-gating initiative in the AVC favela was implemented around 1998, according to one of the local residents. It was the result of community police meeting with residents who complained against shootings, and the presence of drug dealers and drug addicts. Since then, the gate remains open during the day and closes at 10 p.m. Others residents in alley-areas in the Alto Vera Cruz favela integrated similar initiatives, inspired by the same feeling they were unsafe. Residents of alley-gated settings argue they feel safer as a result of peace being restored with the use of gates. There were no more individuals smoking marijuana or cocaine; no more sounds of shootings or people running

through the alleys trying to escape and hide from the police, or sometimes breaking into houses. A series of photographs of examples of gated alleys in the Alto Vera Cruz favela is presented in the following page:



Photo 29: Gated alley (since 1998)



Photo 30: Gated alley (since 2004)



Photo 31-32: Gated alley (since 2005)



Photo 32

Alley-gating initiatives suggest that some residents of the Alto Vera Cruz favela are taking a very simple, low-cost and practical way of preventing crime – controlling exits, thus increasing the risks for offenders in committing crimes, as recommended by the situational crime prevention techniques model.

However, the implementation of this strategy requires a deep and systematic empirical analysis of initiatives already in place. It is important to consider alleys' features, their surroundings, crime problems and local residents' demands, in order to decide in which settings alley-gating may work as a suitable crime prevention measure. The planning, implementation and evaluation of this measure should involve a partnership between researchers, crime analysts, the police, residents in alley-settings and engineers responsible for the urban planning and design of favelas in Belo Horizonte.

9.2. CUT OFF BARS FROM ATTRACTING VIOLENCE

Research findings reveal that bars are a very strong predictor of likely places for homicides. Bars are crime attractors providing opportunities for illegal activities. Although this research does not show exactly how bars are associated with places where homicides are committed, it offers some hypotheses:

First, the heavy consumption of alcohol by likely victims increases their vulnerability to being victimized – they might be easy to find and hunt, reducing the obstacles for offenders. Victims' consumption of alcohol in the Alto Vera Cruz

favela might be high, considering that 31 out 36 homicide reports with information on autopsy's blood test for alcohol and drug use show positive results. It also shows that 24 out 31 victims with positive blood test were murdered at night and early morning.

Second, the ubiquity of unlicensed bars that stay open all hours in the Alto Vera Cruz favela, (there are no official statistics on the number of existing bars,) thus there is no regulation over their licensing or taxation. The lack of regulation on these bars and the times they can operate might be an important element that contributes to making bars and their surroundings suitable settings for illegal activities. The evidence shows that policies meant to prevent homicide should include situational measures that prevent bars from attracting violent behavior, and some recommendations should be considered such as:

1. Regulating bar's business operation.
2. Controlling the number of licensed bars, shutting down those that do not provide appropriate conditions for patrons, such as ventilation, lighting, restrooms, and seats.
3. Restricting alcohol sales and consumption in public places, reducing the time of bars' operation, considering that over 50 percent of homicides in the AVC favela occur between 7:00 p.m. and 6:00 a.m.

The recommendations presented here are supported by extensive literature on bars and crime showing that alcohol consumption and violence are

highly correlated (Roberts, J. 2007; Homel *et al.*, 2004) Situational prevention policies have been focused on management practices, improving the areas surrounding bars, and regulation.

In addition, an evaluative study on dry laws and homicides in the metropolitan area of Sao Paulo, the largest metropolitan area in Brazil, concludes that restricting recreational consumption of alcohol through adoption of a dry law – mandatory nocturnal closing hours for bars and restaurants – has a positive impact in reducing homicides (Biderman *et al.*, 2006). As the authors state:

“At our benchmark estimate, dry laws cause monthly homicide rates per 100,000 inhabitants to fall by almost 0.5, which means a 10% reduction. To the best of our knowledge, this is the first estimate of the impact of alcohol restrictions on bars and restaurants on violent crime accounting for endogeneity and that cannot be confounded with other policies or secular trends. Restricting opening hours has the advantage of being easily enforceable. Consider the enforcement of the minimum drinking age: it is much harder to monitor whether a bar sells alcohol to minors then verifying whether it is opened at certain hours. ..Prohibition and taxation fail because they do not reduce consumption, and may shift consumption to heavier “psychotropic.” Restricting recreational consumption is less radical and more targeted than prohibition. The purpose is not to prevent people from drinking, but to make it difficult to do so in particularly dangerous settings” (Biderman *et al.*, 2006: 19-20).

Another good example of successful experimentation in reducing homicide through regulation of alcohol sales is in the town of Diadema in the state of Sao Paulo, Brazil (Duailibi *et al.*, 2007). As mentioned before, prior to 2002 in Diadema, the majority of homicides and violence against women occurred between 11 p.m. and 6 a.m. in neighborhoods with high concentrations of bars. In 2002, the mayor of Diadema adopted a new municipal code prohibiting the

sale of alcohol after 11 p.m. This policy reduced the number of homicides by 44 percent and became a known for one of the most effective prevention efforts in Brazil.

Interventions in bars to reduce violence in the Alto Vera Cruz favela should be part of a problem-oriented policing strategy calling for partnerships with local authorities, public officials of the URBEL, crime analysts, bars owners, and the police. A crime prevention strategy should be implemented with an emphasis on problem-solving analysis. Community meetings should be held to publicize new crime prevention strategies in the favela. In order to control whatever negative effects these measures might have, such as creating a market for illegal alcohol retailers, or increasing other types of crime and displacement of violence to other locations, evaluative research on the effectiveness of these prevention measures on changing criminal behavior should be systematically enacted.

9.3. ASSIST NATURAL SURVEILLANCE BY CHANGING THE URBAN DESIGN OF THE FAVELA:

This study may help urban planners and architects to incorporate opportunity-reducing measures to physically change the urban design of the favela, for instance, (1) widening settings consisted of numerous interconnected alleys in drug areas, (2) avoiding the unintentional creation of hiding places and escape routes for criminals, and (3) allowing residents to more easily monitor

their surroundings. These measures might help to make the favela more secure. As shown in Kernel maps there are two hot spots for homicides in the Alto Vera Cruz favela, one located in the Pit Bulls Brothers' drug-trafficking turf, and another in the Augusto Papine's drug-trafficking turf. In addition, kernel maps identify a large area considered a cooler spot of homicides on turf controlled by the *Cruzeirinho* drug-trafficking gang. These spots where homicides are frequently committed share a common characteristic: the presence of interconnected alleys as previously shown. In addition, the results of the conditional logistic regression show that homicides are more likely to occur near interconnected alleys rather than near places without conjoined alleyways.

The idea of changing the physical environment of alley-settings in drug areas stems from Oscar Newman's approach of defensible space for crime prevention, which was introduced in the 1970s. This approach involves "*the physical layout of communities to allow residents to control the areas around their homes*" (Newman, 1996:9). Defensible space programs include a wide range of planning and design strategies to restructure public areas (streets, grounds, playgrounds, parking lots) outside their buildings and the interiors within them (lobbies, stairs, corridors, elevators, laundry rooms, etc.) and their re-assignment to the control of neighboring residents. According to Newman, this approach is suitable for residential areas with a large number of people sharing common spaces, in which "*residents cannot assert responsibility for their safety and maintenance, and these places are left vulnerable to crime and vandalism*"

(Newman, 1996:17). The Alto Vera Cruz favela seems to fit as one example of such residential areas. It has a high population density, in which houses were irregularly and tightly built one next to another, without leaving any space in their surroundings. Besides a small park, numerous bars and few luncheonettes, there is no other public place for recreation in the favela.

The design of alley-settings suggests that residents do not share a common space that they identify and recognize as theirs. In these areas houses are built one next to another without ventilation between them, thereby creating narrow and long irregular paths that are connected one to another resulting in a disorganized public space in which graffiti can be seen everywhere. Windows on front houses are small, and offer no clear sightline to the street outside. Houses are also surrounded by cement walls in front, without visibility to alley-paths.

The idea of Defensible space should be applied to the Alto Vera Cruz favela in order to restore the ownership of the favela to its law-abiding residents. Linked with the Defensible space approach is the concept of Crime Prevention through Environmental Design (CPTED) which was introduced by Jeffrey (1972). According to this concept, physical interventions in the built environment influence the offender's decision process that precedes criminal acts. Based on this approach, five crime prevention principles should be applied in order to provide a physical environment that can reduce opportunities for crime. These principles are:

3. **“Surveillance and visibility:** Passive surveillance is the causal observance of public and private areas by users or residents during the course of their normal activities. Active surveillance refers to surveillance by police or other agents whose express function is to “police” an area. Visibility is the degree to which an environment is made visible by elements such as lighting and uninterrupted lines of sight.
4. **Territoriality:** Territoriality is a sense of ownership of one’s living or working environment. Territoriality and a sense of ownership are encouraged when residents identify with the spaces and where the space and its configurations are tangible to them.”
5. **Access and escape routes:** Certain types of criminal events and sites are often deliberately chosen for their ease of access to escape routes. Similarly, the availability of access and escape routes also adds to the safety of potential victims
6. **Image and aesthetics:** The image projected by a poorly maintained building or a public area has been clearly linked to levels of crime and particularly to the fear of crime. This link is often referred to as “crime and grime.”
7. **Target hardening:** Target hardening reduces the attractiveness or vulnerability of potential targets by, for instance, the physical strengthening of building facades or boundary walls.” (Kruger et al., 2001:34-35.)

Interventions in the physical design of the Alto Vera Cruz favela should take into account both concepts – the defensible space approach and CPTED strategies.

It is important to bear in mind that intervention is a complex solution for residents looking to reclaim a sense of identity and control over public spaces in their neighborhoods. The bonds they share with their neighbors, combined with the possibility they will be threatened by offenders for their efforts to thwart crime, are difficult barriers to overcome. Murderers in the Alto Vera Cruz favela are not intruders; they are inhabitants of the favela, which makes it more difficult for other favela residents to reject them. These residents may have conflicting feelings of

respect and fear, as one drug-dealer “boss” revealed. According to him, favela residents usually do not report crime. Even though they see a crime in action they don’t want to testify against criminals. It is very rare for someone to become a witness in a criminal case because no one wants to point the finger at offenders. Potential witnesses know criminals retaliate against fellow favela residents who report crimes to the police. Criminals know the power they wield; therefore they threaten citizens in order to prevent them from going to the police. In addition, drug-dealers try to earn residents’ respect by protecting the community against robbers or assaults within the favela. As a result, these offenders feel confident they will be welcomed to sleep, shower, and dine in any house in the favela. .

Any re-design of the layout of favelas, especially in hot spots around drug areas, should take into account that law-abiding residents are subjected to threats on a regular basis, as well as an atmosphere of fear that permeates the community, even though many law-abiding inhabitants may be acquaintances, friends, and family-members of those involved in crime. An urban re-design with new buildings and surroundings promoting more natural surveillance by residents over public spaces should be combined with a package of other situational interventions that might increase formal surveillance as well, such as the implementation of CCTV in favelas, as it is discussed next.

9.4. INCREASING FORMAL SURVEILLANCE THROUGH ACTIVE CCTV SYSTEMS

This study opens a broad discussion on the implementation of surveillance technology such as active closed circuit television (CCTV) systems that can monitor in real time what happens in public spaces in the favela.

According to Jerry Ratcliffe (2006) CCTV systems can be extremely sophisticated. They can include bullet-proof casing, vision capability, motion detection, advanced zoom and automatic tracking capacities. The author classifies CCTV systems in two types: passive and active. The latter refers to systems in which individuals monitor a series of displays in real time while the former refers to systems in which the images are not monitored. Theoretically, Ratcliffe emphasizes, CCTV systems function as a useful means of oversight, leading offenders to realize they run a higher risk of getting caught. But evaluations of the effectiveness of CCTV systems in crime prevention have shown them to be an appropriate situational-crime-reduction measure for property crime rather than for violence and public disorder. CCTV systems might have less impact in preventing crime problems in which offenders' perception of risks are reduced due to the use of alcohol or drugs, as is common in many crime situations in which offenders are unimpeded at being surveilled (Jerry Ratcliffe, 2006.)

The implementation of CCTV in the Alto Vera Cruz favela and other hot spot favelas is of questionable value because, offenders don't care if the cameras are recording their actions, and they are unlikely to stop their illegal activities. They will probably shoot, disconnect or damage the cameras, and in all likelihood move their activities to a different setting. In addition, the disorganized socio-geography of the favela, interconnected by numerous alleys and irregular topography might make it difficult to find an appropriate location to place the cameras. There is also cause for concern regarding the expense of implementing CCTV systems that could lead to hostile public perception that taxpayer money are being wasted on poor, socially disorganized favelas where residents don't pay taxes.

However the counter argument in favor of implementing an active CCTV system in the favela in this study is that it can hasten police responses to incidents involving shootings, especially in locales in which gangs are active and where bars are located. It can also assist the policing group GEPAR in the Alto Vera Cruz favela, providing information on local offenders, such as where they hang out, who their allies and enemies are, and everyday illegal activities that risk escalating into violence. In addition, CCTV systems can encourage an atmosphere of increased surveillance in public spaces, reducing impunity for criminals and reducing residents' feeling of vulnerability at the hands of criminals. A network of cameras can also reduce residents' feeling that the authorities don't care about their safety, except during elections. In addition, active CCTV systems

might increase the risks for offenders, increasing the certainty that they will be caught if they commit violence. CCTV systems also might bring about quicker convictions in criminal cases because police investigations will no longer depend only on the testimony of local residents, most of whom are very unlikely to collaborate with the police due to threats by the offender.

However in order to increase the effectiveness of CCTV systems in Alto Vera Cruz, the cameras must be equipped to withstand offenders' attempts to disable them, and should be strategically located, systematically monitored, and implemented as one part of a broader situational intervention aimed at planning and rebuilding the favela's urban layout. As a result, CCTV might not only help police to respond more effectively to crimes, they can also help create a safer atmosphere in the favela.

In sum, it is important to highlight that the implementation of the policies presented here should involve residents and officials involved directly and indirectly in reducing violence in the favela – community members, criminal justice practitioners, family members, offender's handlers, municipal authorities, other community stakeholders and researchers. Crime prevention policies should also be implemented as a whole package of different problem-solving strategies that should be systematically assessed.

OVERVIEW:

Chapter 9 presents the main policy implications consisting of a series of situational crime prevention measures such as (1) access and control through alley-gating, (2) natural surveillance by interventions on the urban environment; (3) regulation and controlling of the number of licensed bars and restriction on alcohol sales and consumption in public places, (4) and strengthening formal surveillance through active CCTV systems in the favela.

CONCLUSION AND FUTURE RESEARCH

This study shows how the problem of homicides in a Brazilian favela increases proportionate to specific settings inside the favela which allow criminals to get away with killing more easily. These settings are characterized by the sale of illegal drugs, adjacency to bars, numerous hiding places and escape routes, and an urban landscape that helps to reduce surveillance by residents and the public. The main goal of this study is not to provide an extensive analysis of social and individual causal factors of the motivations for violence nor is it to reduce the analysis of a complex problem such as homicide to deterministic environmental causes. Instead, it is aimed at exploring the role that situational features of settings in which violence occurred plays in explaining how and why certain places are more prone to the commission of murder by reducing risks and obstacles for killers.

This study uses this approach to reinforce the conceptual component of the situational crime prevention perspective that practical solutions to crime should focus on manipulating the immediate opportunities that exist for criminals by, managing situational variables to make the commission of crime less attractive for potential offenders. From this standpoint, changes made to the opportunity-cues that a criminal may find in his surroundings could potentially affect a motivated offender's decision-making process, thus helping to change criminal behavior. In addition, making places safer might have a broader positive

effect on improving the quality of life in communities where the government has failed to provide basic resources and public services.

A variety of responses have been applied in order to eradicate violence in the Alto Vera Cruz favela through both repressive and preventive criminal justice responses as well as social programs aimed at empowering the community to address local crime problems. However, none of these has focused on investigating opportunity variables in settings in which homicide occurred.

In addition, the research findings of this study suggest the importance of investigating the distribution of homicides in geographical space as well as its temporal patterns in order to design efficient solutions to reduce homicides. However, the implementation of these responses must consider not only their impact on criminal behavior itself, but also the social costs that they might have on the everyday life of the local community. Situational measures to respond to violence must be accompanied by a systematic assessment of possible displacement of crimes from one location to other locations, diffusion of benefits and the understanding that criminals will adapt their own behavior to preventive measures.

The research findings presented here also open possibilities for a broader discussion for Latin American policy makers, criminal justice practitioners, crime analysts, researchers and other potential stakeholders, regarding the challenges of containing murder rates in impoverished areas. The study recommends that future research should focus on understanding the immediate opportunities that

help to make specific settings favorable to violence such as bars and their surroundings, as well as drug areas. In addition, a future research agenda should also promote more empirical and comparative studies on the relationship between urban design in economically deprived neighborhoods and spatial distribution of homicides and other violent crimes.

In sum, the study presented here provides a different way to look at violence in homicide hotbed favelas, strengthening a basic principle of Environmental Criminology that opportunities make the thief, and no crime can occur without the existence of situational factors that help criminals commit and get away with crimes.

OVERVIEW

The conclusion of this study indicates some themes for a future research agenda such as empirical studies on the immediate opportunities that help to make specific settings favorable to violence such as bars and their surroundings, as well as drug areas. In addition, a future research agenda should also promote more empirical and comparative studies on the relationship between urban design in economically deprived neighborhoods and spatial distribution of homicides and other violent crimes.

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Annex 1:

DATA Collection – PILOT PROTOCOL				
Address _____				
Place free of homicide () Place with homicide ()				
Date: _____ Time _____ Weekday _____				

Independent Variables	Measurements		Code	
Physical-geographical and situational variables	Units of observation	Measures	YES (1)	NO (0)
Physical and natural barriers that facilitate the action and the escape of the offenders	Types of vegetation and other barriers that can limit the vision of any external observer and/or to provide hiding place for the offender	Vegetation that offers a hiding place for the offender.		
		Other type of barrier that offers the attacker the possibility of surprising the victim		
	Physical aspects of the houses that could facilitate the escape of the offender from the crime scene	Roof material that supports the weight of a person weighting at least 50kg		
		One storey attached houses that facilitate the offenders' escape from the place		
		House enclosure less than 2 meters high		
	Features of the accesses and exits that could facilitate the offenders' escape	<u>Type of Accesses:</u> 1) Main street 2) Local street 3) Pedestrian route or alley 4) Connecting street to another neighborhood		
		<u>Features:</u> 1) Stairway accesses/exits 2) Curved accesses/exits 3) Accesses/exits with angles up to 90o 4) Straight accesses/exits 5) Accesses/exists in flat or level topography 6) Accesses/exits in topography equal or to below 37o (which is an acceptable level) 7) Accesses/exists in		

		topography above 37o (which is considered a risk)		
	Volume of vehicle and pedestrian traffic	<u>of vehicle traffic:</u> 1) Light 2) Very light 3) Moderate 4) Heavy 5) Very heavy <u>of pedestrian flow:</u> 1) Light 2) Very light 3) Moderate 4) Heavy 5) Very heavy		
	Adequacy or inadequacy of public lighting	Lampposts at least 15 meters from the observed place		
		<u>of lampposts:</u> 1) Wood/rustic 2) Metal/modern		
Physical barriers to informal surveillance of places	Layout of houses that could serve as obstacles to the informal control and surveillance of public spaces	<u>of houses:</u> 1) Attached houses 2) Non-attached houses 3) Shanty 4) One storey house 5) Two storey house 6) More than two stores		
		<u>of windows patterns for ventilation and lighting:</u> 1) Windows with clear glass 2) Bascule or louvered window 3) Metal Venetian window		
		<u>position:</u> 1) On the front walls 2) On the side walls		
		<u>type:</u> 1) Metal 2) With glass 3) Wood		
		<u>position:</u> 1) Front entrance 2) Side entrance 3) Back entrance		

		<u>pattern:</u> 1) Front garden 2) Back garden		
		<u>vegetation:</u> 1) Grass 2) Bushes 3) Weeds 4) Trees of all sizes		
		<u>of house enclosure:</u> 1) Cement wall 2) Fence 3) Gate 4) Wild vegetation 5) Fences, gates, walls, vegetation between the houses		
		<u>of the enclosure:</u> 1) Knee-high 2) Waist-high 3) Above eye level		
Physical barriers to formal surveillance	Concentration of alleys that obstacle police surveillance of places	<u>of alleys:</u> 1) Closed alleys (with gates) 2) Dead end alleys 3) A segment of a main street 4) A segment of a pedestrian route 5) A segment connected to a street leading to another neighborhood 6) Connected to other alleys		
		<u>of alleys:</u> 1) Equal to 90cm 2) More than 90cm 3) Less than 90cm		
Social-geographical variables: Factors which facilitates the encounter of offenders and their victims	Drug dealers' turf	Observed address inside drug dealers' turf.		
	Adjacency or proximity to a drug selling-street spot	<u>of drug selling activity:</u> 1) Evidence of young adolescents or adults selling drugs. 2) Evidence of peer group gangs hanging out.		
	Presence of bars	1) Bars near the observed address (distant less than 15 meters).		

	Absence of infrastructure and mechanisms to control the use of public places such as plazas, parks and soccer fields	1) Presence of abandoned plazas, parks and soccer fields near observed address. 2) Evidence of any identification that indicates formal or community control of the use and function of the area. 3) Evidence of a place manager 4) Evidence of official garbage collection. 5) Evidence of graffiti or vandalism. 6) Evidence of any litter or debris.		
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PROTOCOL TO ASSESS SITUATIONAL FACTORS IN THE AVC FAVELA 4. Address _____ 5. Type of address: Free of homicide () or Homicide address () 6. Date: / / 2007 - Time: _____ Weekday _____				
Independent Variables	Measurements		Values	
Predictor variables	Units of observation	Measures	Yes (1)	No (0)
Convergence Variables	1. Adjacency of an observed address to drug areas	<u>areas:</u> a) Note whether the observed address is inside drug-trafficking gang turf or adjacent to a drug selling spot. b) Note if there is evidence of individuals selling drugs or the presence of peer group gangs hanging out at the observed address. Complementary police information on the location of drug spots and various drug area borders is used.		
	2. Proximity of an observed address to bars	: Is there any public drinking place less than 15 meters away from the observed address? If yes, how many bars are there? _____		
Commission Variables	1. Proximity of an observed address to interconnected alleys	<u>alleys:</u> Is the observed address an interconnected alley or is it within at least 15 meters of an interconnected alley? Note that the value of zero might also refer to an existing dead-end alley or a closed alley.		
	2. Informal surveillance mechanism in the observed address	<u>front windows with clear visibility to street:</u> Are there home's whose front windows offer clear visibility to the outside at the observed address? Note that the value of zero might refer to: a).A home whose' front windows are limited by high walls or other physical barriers. b).A home whose' front windows are located on the second level of two storey houses without clear visibility to streets. Addresses that are not residential, but are commercial stores, garage gates, enclosed spaces, churches, plazas and abandoned lots without clear sight lines to the street.		
		: 1) Is there evidence of any type of stores near the observed address? 2) If yes, how many stores are there? _____		
		<u>phones</u> Is there evidence of public phones near the observed address? If yes, how many public phones are there? _____		
		<u>stops</u> Is there evidence of bus stops near the observed address?		

		<u>traffic</u>		
		Is the address located in a route in which cars and buses circulate?		
		Is there any lamppost located near the observed address?		

Annex 3: Photographs of observed addresses.

Homicide address 1: 1352 Desembargador Bráulio Street/Otavio Alley

Date of crime: 1/27/2002 – **Time of crime:** 6:00 p.m.

Date of photos: 9/27/2007 – **Time of photos:** 5:23 p.m.



Synopsis of crime: *The 17-year-old male victim was killed by 4 gunshots. He was identified as a drug addict by witnesses and the autopsy confirmed drugs in his system. The homicide occurred on a commercial street characterized by heavy vehicle and pedestrian traffic near Otavio Alley, which connects Desembargador Bráulio Street to Augusto Papine Alley, a drug area. The Otavio Alley was gated in 2005. The victim had left his home minutes before being shot and was alone at the time. According to the police, drug debt was the main motive for crime.*

Corresponding control address: 759 Cicero Alves Alley

Date of photos: 12/15/2007 – **Time of photos:** 11:30 a.m.



Homicide address 2: 532 Augusto Papine Alley (gated alley since 2005)

Date of crime: 9/20/2003 – **Time of crime:** 11:00 p.m

Date of photos: 10/19/2007 – **Time of photos:** 3:31 p.m.

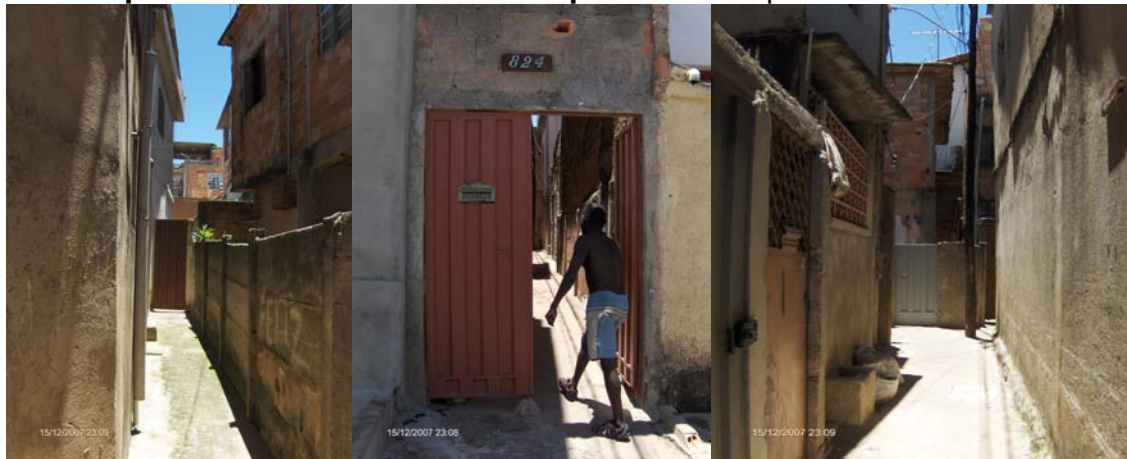


Synopsis of crime:

“The victim’s body was found in a narrow, poorly lit dead-end path on Augusto Papine alley. Autopsy results showed drugs in the victim’s blood. There were no witnesses to this homicide, which is still being investigated at the time of this research. It is suspected that victim and killer knew each other. The homicide setting is characterized by the high walls of a few unfinished brick houses, which are obstacles to informal surveillance. Fearful of the constant shootings and drug dealing in the area, the local residents closed the alley with a gate in 2005.

Corresponding control address: 74 Rocha Meireles Alley Cicero Alves Alley

Date of photos: 03/05/2007 – **Time of photos:** 2:25 p.m.



Homicide address 3: Antonio Felipe Alley with Eduardo Alley **Date of crime:** 09/08/2005 – Time of crime: 2:30 p.m.

Date of photos: 10/20/2007 – Time of photos: 2:35 p.m.



Synopsis of crime: an 18-year-old male was killed with 2 shots on the intersection of Antonio Felipe Alley and Eduardo Alley. The autopsy confirmed drugs in his system, and according to the police the motive for crime was drug debt. The victim had apparently left a bar and was walking alone when he was shot. No witnesses came forward. The homicide occurred in Buraco de Sapo – a drug area – near the residence of one of the drug dealers who control the local drug traffic.

Corresponding control address: 759 Cicero Alves Alley

Date of photos: 12/15/2007 – **Time of photos:** 11:30 a.m.



CURRICULUM VITAE

Place of Birth: Belo Horizonte, Brazil.

Education:

2010: Ph.D. Criminal Justice – Rutgers, The State University of New Jersey.
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Subject pursued: Policing, Environmental Criminology, Crime Analysis, CPTED, Crime Prevention Policies, and Comparative Criminal Justice.

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1999-2000: Instructor of Government School - Joao Pinheiro Foundation, Minas Gerais, Brazil.

Publications:

Souza, E. (2006). “Explorando Novos Desafios na Policia: O Papel do Analista, o Policiamento Comunitario e a Metodologia IARA.” In *Analise Criminal e o Planejamento Operacional*. Vol. 1, pp.92-103. Instituto de Seguranca Publica, Rio de Janeiro, Brazil.

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