

## The Role of Morphology in a Context of Social Inequality

### **Circe Monteiro**

Universidade Federal de Pernambuco, Graduate Program on Urban Development MDU, Recife, Brazil  
monteiro.circe@gmail.com

### **Carolina Puttini Iannicelli**

Universidade Federal de Pernambuco, Departamento de Expressao Gráfica, Recife, Brazil  
carolina.pti@gmail.com

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### **Abstract**

*The state capital city of Recife in the Northeast of Brazil is known as the most dangerous city in the country. It not only presents the highest rates of murder of young people but also has the reputation of being a very unsafe city due to the prevalence of street crime. Recife also presents high levels of poverty and social inequality. Nearly 70% of the population lives in shanty towns scattered throughout the city; it is spatially characterized by islands of wealth in a sea of poverty. The threat of untargeted street crime happening at any time anywhere puts everyone at risk. The sense of insecurity and fear, allied with a lack of confidence in the police, leads many inhabitants to adopt measures for their individual security. While driving, car windows are always closed, and have a screen film to prevent those outside being able to see in, as a general rule, no one dares to stop at a red light late at night. High walls, iron bars, electric fences, armed gatekeepers, video surveillance are very common features of residential buildings. All these measures make public spaces and the public interface, especially sidewalks, more insecure, no movement and prone to crime. This paper was planned to study the spatial pattern of crime that has occurred in the city's wealthiest neighborhood: Boa Viagem, famous for its beach and tourism. The study seeks to identify the spatial qualities of crime locations. The study deals with urban crimes, mainly mugging and theft which take place in the streets of the neighborhood. Spatial aspects such as global and local accessibility were explored by means of space syntax measurements as well as depth from favelas and commercial and services equipments. The local results reveal that these spatial qualities in isolation provides weak explanations to understand the local pattern of crimes locations. There is strong evidence that other social qualities of the space play an important role in the occurrence of theft and mugging. Other features are also considered such as proximities to markets, shopping centers and poor neighborhoods such as favelas. A total of 4800 occurrences of theft and muggings in 2006 were mapped and analyzed. Local results contradict international findings because they show that in a context of high social inequality, such as in Recife perceived social qualities of spaces provide the most soundly-based explanations for the occurrence of urban crimes.*

### **Introduction**

This article sets out to offer a contribution to recent studies on configuring urban space and the occurrence of crimes (Shu, 2000; Sahbaz and Hillier, 2007; Nes, 2007; Shu and Haung, 2003, Schneider and Kitchen, 2007, Atlas, 2008). Unlike the majority of studies that observe patterns of crime in European cities (burglary and car theft ) we shall present results on two types of violent crime that occur with great frequency in the streets and open spaces of Brazilian cities: theft and mugging. While most studies indicate that security is greater in more accessible areas and when there is movement and the co-presence of cars and pedestrians (Hillier and Shu, 2002) there are

contrary indications that such a relationship cannot be verified in other contexts. A study in Chile about the perception of insecurity and places where crimes occur, (Green and Green, 2003) suggests that in Latin American Catholic cultures based on closeknit social networks, the presence and movement of strangers in the streets is seen as an indicator of insecurity, "the stranger is seen with distrust."

Another similar study conducted in residential areas in a town in the south of Brazil (Reis et al, 2003) also indicates that there is an inversion in the correlation between greater integration, greater perception of security and lower incidence of crime. This investigation aims to verify whether, in a diverse socio-cultural context, with great social inequality between the groups that use the same space, the occurrence of crimes reflects different forms of spatial logic in the perceptions of risks, the assessment of opportunities and choices of situations prone to crime. We have set out to verify the veracity of assumptions that are widely broadcast as "common knowledge" which consider that it is dangerous to be at the interface close to favelas (shanty towns) and that the most dangerous places at night are the ones that are the most spatially segregated and empty ones.

The results presented here are partial and are part of a more extensive research which aims to identify the spatial pattern of crimes in public spaces, taken from the multivariate profile of macro and micro spatial qualities present in each crime situation.

### **Why is street theft and mugging a rising trend?**

According to a United Nations report, "two thirds of the inhabitants of cities have been victims of some kind of crime at least once in a five year period" (ICPC, 2008). Among the categories of offense that most grew in the last twenty or thirty years are crimes related to drugs and mugging. This situation is felt differently in different places around the world. The increase in muggings is felt with greater intensity in Latin America countries (victimization rate of 6.7%) than in European countries (1.3%) and North America (2.3%) according to official reports (ICPC, 2008).

The increase in theft and muggings in cities challenges various disciplines to put forward policies, and projects that make urban spaces safer. Consequently we have been witnessing an increasing number of studies on the spatial patterns of urban crimes, and explorations that indicate to us what the role is of spatial, environmental, functional or social contexts in structuring safer urban contexts.

One reason that determines the urgency of addressing street crime is that these happen in the public spaces of cities and are characterized by indiscriminately victimizing every type of citizen, without distinction of social class, age or gender. Therefore, the greater incidence of these crimes causes a great sense of insecurity, people feel at mercy of criminals at anytime and anywhere. The increase in street mugging associated with the absence of a system of effective public protection is also responsible for the emergence of generalized urban fear. This fear is the agent which most transforms cities and has led to the emergence of hostile architectures, or so called architectures of fear (Ellin, 1997). To the extent that city-dwellers implement individual protection measures, such as putting bars on windows, installing safety doors, erecting high walls with electric fencing and adopting more stringent control systems in their spaces, they transform the atmosphere of the street, the city neighborhood and the way that people behave in them. The new "privately secured" spaces according to our assumptions have brought about the greater vulnerability of public spaces that have gradually been losing their natural users and offer better opportunities for offenders.

### **Street crimes in the context of social inequality**

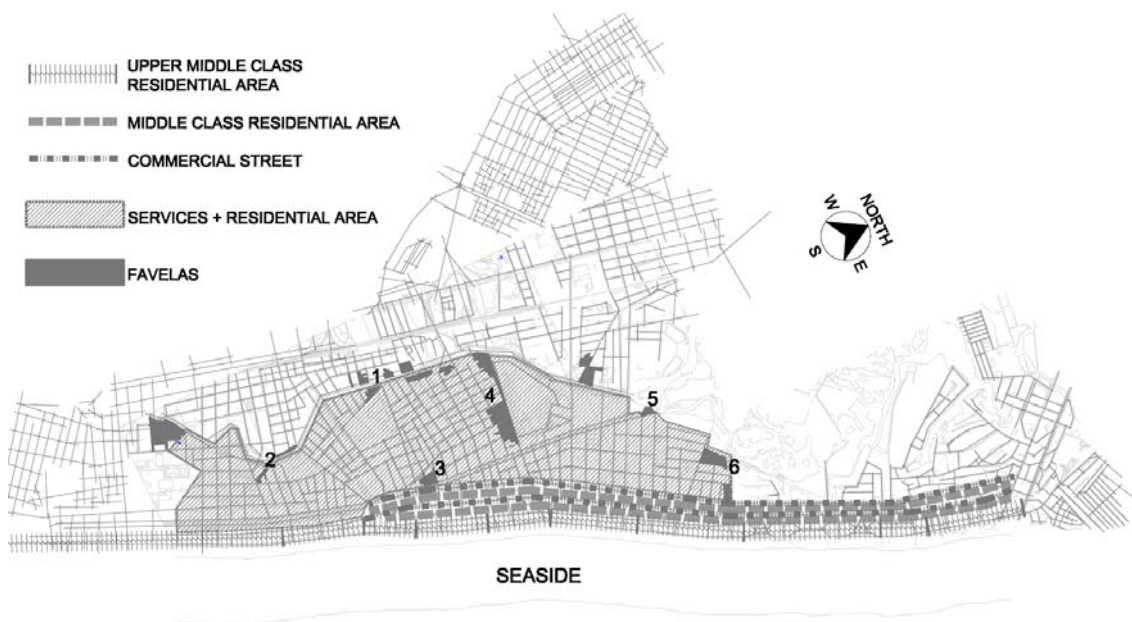
Sharp social inequality and large-scale poverty are the main trade-marks of large Brazilian cities. In the last ten years, Brazilians living in shanty towns have increased at a rate almost three times greater than the overall average of population growth. While the general population has grown at a rate of 0.74% per year, the number of those living in shanty towns has grown at a rate of 2.4%. Recife is no exception, a city of 1.5 million people characterized as a city with a population of poor

people in shanty towns and lower middle-class neighborhoods situated cheek by jowl with islands of wealth.

We have chosen to analyze the district of Boa Viagem, one of the reasons being that it is considered a neighborhood for the upper middle class, due to its location at the beach and having the best infrastructure of services as to the location of schools, shopping centers, restaurants and a vast array of leisure facilities for tourists. The modern and cosmopolitan district which houses a rich minority, contrasts with the many shanty towns that were already located in areas along the river and beside the mangroves before the neighborhood grew and densified. The neighborhood is very heterogeneous, being one where shanties co-exist with luxury apartment buildings and are close to busy commercial areas, and the Shopping Center. The district of Boa Viagem has approximately 100 thousand residents, 15% of whom live in the eight shanty towns or poor areas that remain in the neighborhood due to a law that protects them by classifying them as Special Zones of Social Interest – ZEIS (in Portuguese) (see Figure 01 ). Although the space occupied by the favelas has not increased, there has been an increase in residential density in these areas, the dwellings in have been verticalized, the buildings have been improved, but the relationship of physical segregation continues. The favela`s space resulting from the spontaneous growth is complex and with low legibility. Only the residents and people who are known venture into the alleys and internal streets of the shanty. Not even the police risk entering a favela to search for criminals.

All favelas, in general, have a main entrance. This open interface is usually very dynamic, full of people and children going about their daily activities as well as those who keep a watch on who leaves and enters the area. For this reason the shanty towns were chosen as the central point for drug-trafficking, because of their proximity to rich areas and the extreme surveillance and access control.

This district of Boa Viagem has the highest square meter value in the city, and is therefore much sought after by the realty estate sector. The residential occupation of the middle class and upper middle class area is highly densified, with new buildings rising up to 40 floors.



**Figure 1**  
*Boa Viagem neighborhood and the location of favelas*

This mix is interesting from the social point of view because people from various levels of income divide areas in common spaces and go about their daily lives alongside each other in spaces in the neighborhood especially on the beach the very nature of which is considered the most democratic of all.

This coexistence apparently used to generate little conflict. It was an almost symbiotic relationship between the poorest residents who generally worked in the richest households, and the service sector that needed workers. Criminality has been breaking this pact of coexistence. The increase in criminality and very often of violent crime in the streets, on the sidewalk on the promenade, in the bars, has reached a high level. The inefficiency of the coercive authorities in addition to there being no clear identification of who the criminals are, has made the middle class fortify and isolate themselves behind high walls and non-see-through facades (see Figure 03), and install tight security systems with cameras, electric fences and non-see-through gates.

Fear makes the residents avoid the streets. To buy bread at the corner, they use their cars. Children are taken to nearby schools in bullet-proof cars. Pedestrians are few and far between on sidewalks, which are starting to be used only by people with no purchasing power, or workers, who ply their trades around the streets of the neighborhood, and circulation of passing by people, what Hillier calls 'through movement'.



**Figure 2**

*Closing off sites in Boa Viagem*

### **Pathway to data**

A second reason for choosing the neighborhood of Boa Viagem is due to the police having implemented a system of monitoring and crime analysis called INFOPOL which has allowed the details of each crime occurrence in the neighborhood to be recalled.

The computer system is unwieldy to consult and had a mapping system of little use (large spots with stars marking the number of crimes). The information on the localization of the crimes does not have many details and are both highly imprecise and inaccurate. The main problems identified are the use of different names for the same street and the practice of identifying the occurrence of crimes alongside a street, without giving their precise spatial position.

After examining the raw data, it was decided to work only with mugging and theft, because these are urban crimes committed against passers-by, which involves a spatial situation in which it was committed, the fact of greatest interest for this study.

The data discussed here refer to crimes that occurred throughout 2006 all over the neighborhood. It was necessary to check each occurrence to be able to identify the exact location of each offense. The result of this overview showed there were 6647 occurrences of theft and muggings. It was only possible to map the location of 737 cases, or 11.09% of total incidents, of which 368 were muggings, equivalent to 5.5% of the total number of hold-ups, and 369 crimes of theft also equivalent to 5.5% of all street robbery .

To locate these crimes on the map and to determine whether the crime occurred on public roads or on the victim's lot, each incident was examined to ascertain the nature of the public place, and to distinguish between parking spaces, public highways, sidewalks, residences, commercial establishments, etc..

### **The local nature of street crimes**

The crime of mugging is inserted in the list of crimes against personal property. This crime has the same characteristics as theft. However, it has factors which when added to the element of the type subtracting, generates a new penal type. There is in mugging the subtraction of any moveable object, for oneself or for others, but with the existence of a serious threat or the use of violence against the person, the factors which when used cause the thing to be handed over, are the special circumstances which reveal how it differs from theft. "The conceptual distinction between theft and mugging is that in the first it is illegal subtraction, the second, public and violent removal"

In street crime, there is not necessarily any relationship between the perpetrator and the owner of the object stolen, and violence when used with a view to obtaining a victim's property can affect third parties. One of the major differences in street crimes in Brazil, compared with similar occurrences in other countries is the high degree of violence used. Reports on urban crime in European cities record thefts taking place with a minimum of confrontation and with no threats being made to the victim: pockets are cut with knives, there are pickpockets, or possessions are snatched by thieves on motorbikes. The contrary of this occurs in Recife where most muggings see the display of guns or other weapons. A simple theft of a mobile phone is carried out with a gun held to the head of the victim and often ends in murder. The poor quality of data does makes difficult the identification of how many murders in the city had mugging as the initial move. This type of armed theft also called *assalto* (mugging) in Portuguese leads to the criminal who carries a gun feeling empowered and to his paying little or no heed to whatever third-party watch may be being maintained. Indeed there are many cases where third parties are killed because they have witnessed or tried to prevent a mugging.

What this detail tells us is that, by this logic of criminal action, the choice of location of the crime is mainly based on the perception of reward, and being on the look-out for "quality" victims as they have the greatest purchasing power, demonstrated by the type of car or clothes they have, or place and the activities which they take part in. Unhappily, tourists are the preferred target in the district of Boa Viagem, because they carry larger sums of money and pieces of equipment such as cameras and camcorders.

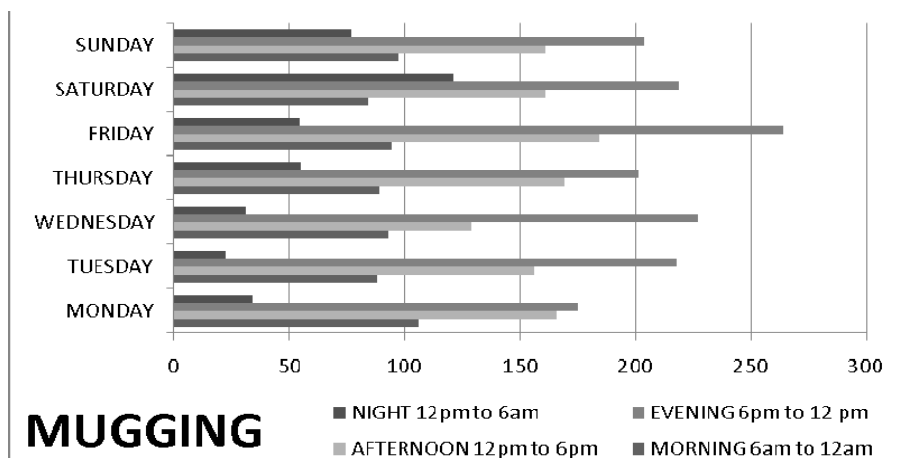
### **The time of day of crimes and the myth of going home early**

According to Canter (2003) two factors are crucial in the link between victims and criminals, time and space. Arising from this, a series of variables defines situations of greater or lesser danger. The first approach towards understanding the pattern of street crimes in Recife was to consider the time of day at which the crimes occurred. Once more, we listened to ideas and common sense advice on security held by society at large. For most people, leaving home at night is very dangerous. Mothers with teenage children either do not let them go out at night or advise their children to remain at parties until dawn and only to return early in the morning. We chose to examine the crimes of theft and mugging as to the time and place at which they occurred. The time of the events was defined by two variables: the time of day and the days of the week. As to the first variable, the occurrences were classified into 05 sub-categories which distinguished between different moments of the day:

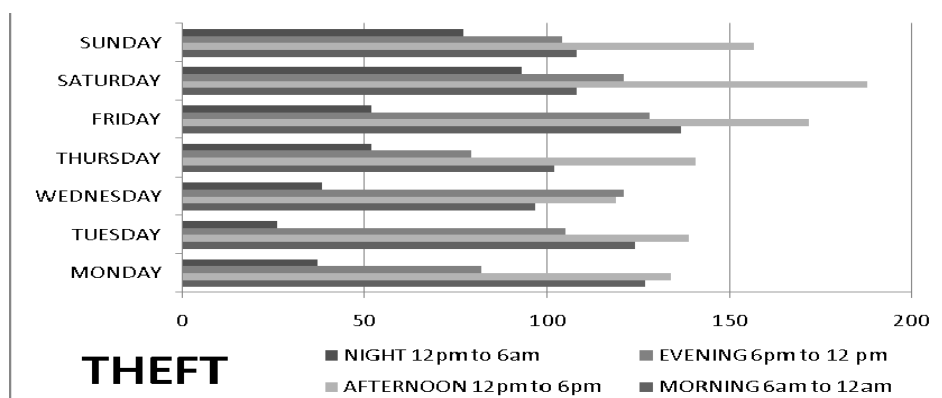
- Morning: crimes occurred between 06:00 and 12:00 noon.
- Afternoon: crimes occurred after noon and before 18:00.
- Evening: crimes occurred after 18:00 and 0000 midnight.
- Overnight: crimes occurred after midnight and 0600.
- NI (not identified): crimes which do not have the exact time specified.

When we analyzed the numbers of all muggings that occurred in 2006, we noticed that early evening is the period in which there occurs the highest incidence of this type of crime, followed, in order of frequency, by the afternoon, morning and night (Figure 3). It is worth pointing out that in the tropical climate of Recife people usually go out at night to meet friends in bars, restaurants and recreational areas. Unlike many European countries 10 p.m. is the time of greatest movement as it is then that people leave home for evening entertainment spots. Boa Viagem is the neighbourhood that also concentrates the largest number of places of entertainment which attract visitors from all over the city and beyond. The closer to the weekend, the greater is the flow of those seeking evening entertainment.

The analysis of the occurrences of theft and mugging indicates that we are in the presence of two different logic. Theft (Figure 4) occurs with greatest frequency in the afternoons followed by the mornings, such frequency being even more pronounced on Fridays and Saturdays. These are the days on which people get paid, spend a happy hour with friends and stay late in town. Friday afternoon and evening is also the period when most muggings occur and this crosses over into the early hours of Saturday, but with a significant drop on Sundays. The beginning of the week corresponds to the days with the fewest occurrences at any time of day.



**Figure 3**  
Occurrences of Muggings per weekday and time



**Figure 4**  
Total occurrences of thefts per weekday and time

The results corroborate in part the observations of Sahbaz and Hillier (2007) made in a London Borough characterized by its variety of uses and the composition of its residents. That is, in both, the situations, in spite of the different cultural habits, rush hours and the times of day with the greatest movement of people correspond to the peak times for these kind of street crimes to occur.

These results, although they seem obvious, demystify some deep-rooted ideas in Recife that it is more dangerous to travel through city streets at dawn than at the beginning of the night when there is more movement. Due to high incidence of muggings on the streets it is a local custom not to obey traffic lights at night, and to drive at high speed to avoid motorbikes coming alongside one's car. In this local context, mothers of teenagers, however, seem to be right to stress there is greater danger when leaving clubs and places with a high movement of people at night.

### **The social and morphological logic in the distribution of crimes**

In order better to understand the morphology of the district, it is necessary to describe some of both its spatial and social features. Boa Viagem was built up in the 70s as a new area of the city by the beach. The neighbourhood is bounded to the east by the sea and on the west, by mangroves and a railway line. The link with the city centre and other districts is formed by two bridges at its north entrance. The continuous occupation of the shore moves in a straight line to the south and forms well-populated districts in another municipality. The privilege of living by the sea-shore is enjoyed by the more affluent social classes, which is clear from the high luxury standard of residential buildings on the shore-line. The high value of this land means that this strip is occupied strictly for residential use.

Two long roads parallel (road A and B) to the shoreline avenue (road C) running in a north-south (NS) direction bring the entire flow of movement into the neighbourhood and take it out again and are characterized by being the sites of commercial and service buildings and residences of an average standard. The occupation of the farthest inland area in the district is more recent and mixed. The residents of these areas benefit from the urban infrastructure of the district but live in more densely-populated areas in apartments of below average quality. The areas close to the neighbourhood on the west are occupied by old housing estates and connected by roads (road D and E) that connect upper-working class neighbourhoods and the outskirts of the city where many poor people live. Only three roads make this east-west (EW) connection. While the NS avenues display uses and inhabitants of well-defined social classes, the EW roads are, on the contrary, noted for the diversity of uses and of social classes: the closer to the sea, the richer the residents, and the closer to western boundary, the poorer the residents and the more mixed the use of the land.

### **Global integration local integration of street crimes**

The syntax analysis of Boa Viagem shows us a neighbourhood with a well-defined integration core comprising the main traffic routes, the three broad avenues parallel to the sea (NS - roads A-B-C) and some perpendicular roads which link the district to the area west of the city (EW -roads D- E). Figure 5 shows the nucleus formed by the most globally integrated roads and Figure 6 the routes of local integration roads. The data available allowed all street crimes that occurred in 2006 to be correlated with the integration values of the roads.

Two hypotheses already outlined in previously (Brantingham and Brantingham, 1981; Sahbaz and Hillier, 2007) are examined: one is that acts of theft are more associated with local spatial logic, and muggings more so global accessibility patterns. That is, those who perpetrate theft seek out their targets in places of daily movement where victims are going about their daily business such as going to the bank, shopping, and where they may also be on their home ground, thus with great knowledge of the vicinity. In different ways, mugging that involves violent attack, is thought to take place near the main access avenues and to be guided most by the sense of spatial and temporal opportunity.

Regressions show that both the correlations of Global integration with mugging and that of local integration with theft are low, the first shows  $R^2 = 3:57$  and the second  $R^2 = 2.06$ . These analyses must be refined due to the great difference between the length of the streets that run NS compared with the EW ones as well as to considering the concentrated pattern of occurrences in certain segments of the streets. A more precise explanation is that, although the shore-line road is the longest of the system and is the one that has the greatest number of crimes, such crimes occur only in some segments of that avenue.

Posterior analyses which correlated thefts with the location of facilities that attract daily movements on the roads in accordance with distinct times of day (banking hours and stores hours of opening, or schools with movement concentrated at peak hours, or even chemists' and supermarkets with longer than normal opening hours), showed an interesting highly correlated time-place patterns of street crimes.

The poor quality of the data on theft and the absence of details on how the deeds were perpetrated (whether the assailant fled on a motorbike, on foot or by car, if he was alone or with a support group) did not allow further exploration to be made at that moment on the dynamic of the crimes.

### **Criminality at the interface of poor areas**

There is a myth that places close to poor areas are more unsafe and dangerous. The morphology and typology of poor areas cause fear in their neighbours who are used to the logic of the orthogonal city. Most residents of the neighbourhood say they are afraid to go anywhere near slums as they fear they will be mugged.

A second myth that runs parallel to this idea is that the poor are criminals or have the propensity to commit crimes. Reality shows the contrary. Residents of shanties are mostly honest people with defined occupations and who have been living in these areas for a long time. However, a shanty town, because its spatial structure is one of difficult access and high control, may very well serve as a shelter for people of evil-intention.

So the next form of exploration was to examine the occurrences of all crimes (of mugging and theft) in public spaces in the vicinity of the favelas of the district. The entries to the shanties were considered as root points, so a count was made of the crimes that had occurred at each step depth according to the distance from the shanties.

The favelas were separated into groups according to their location in the district and the characteristics of their surroundings, and this included some being considered jointly because they share the same urban interface.

- A Area 1 is located between two main east-west link roads in the district and display the highest number of occurrences of crimes.
- Area 2 is a residential area with bars and restaurants nearby.
- Area 3 is where there is a large shanty which surrounds the city's main Shopping Centre.
- Area 4 covers a group of 4 shanties located on the Banks of the river and close to residences and the region of private schools.

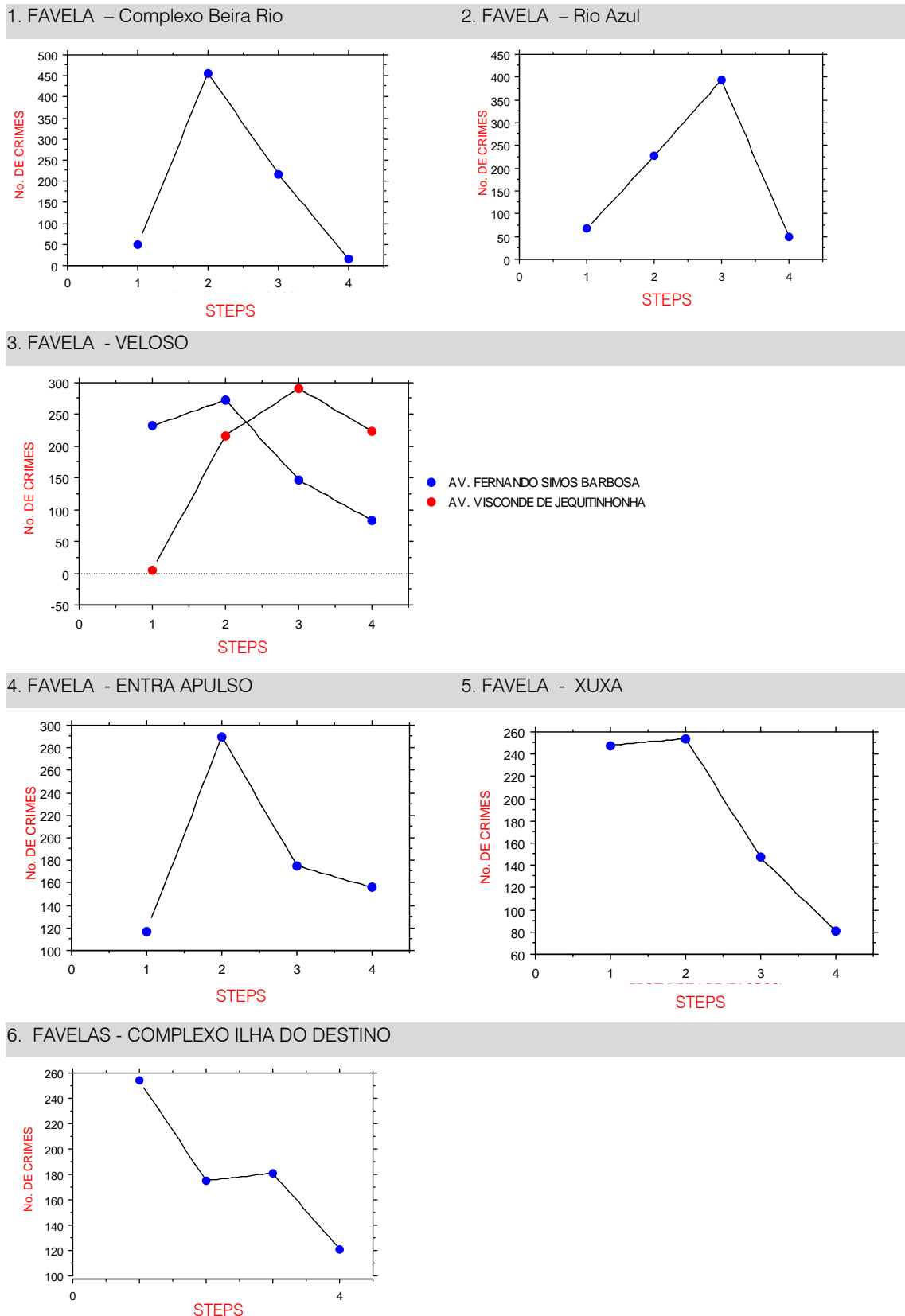
In shanty 1 we observed that the number of crimes at its nearest interface is low and increases significantly and reaches its peak at a distance of two steps from the shanty and diminishes in the areas which are 3 and 4 steps away. This area includes a group of poor areas located on the banks of a canal and along the access route to the neighbourhood which has a rapid flow, as there are no obstacles that require traffic to stop (traffic lights or intersections). The occurrence of 457 crimes in a region at an intermediate distance from the shanty occurs in a mixed area of houses in which there are also some bars, offices, schools, petrol stations, supermarkets and a tennis club.

Favela 2 is also located on the banks of a river at the rear of the neighbourhood. The number of crimes increases with depth from the favela entrance, and reaches a peak of 394 crimes, 03 steps away from the shanty. In this case, this neighbouring region also has schools, churches, gyms, flats and residential buildings and a greater flow of people at trade times.

Shanty 3 has two access roads, is central to the neighbourhood and close to residential areas and many restaurants that attract a large number of people, especially tourists, at the most diverse times of day. The incidence of crime is higher in this region and these roads had, respectively, 232



and 273 occurrences, which only decreases 04 steps away, where there were 83 cases. When we consider the two entrances to the shanty, in both cases the pattern is repeated of there being a greater incidence of crime not in the spaces close to the favela, but rather in medium range distance.



**Figure 9**  
Street crimes occurrence according to depth from "favelas" entrance

Favela 4 spreads alongside one of the largest shopping centres in the country, Shopping Centre Recife. The Entra Apulso shanty is a unique case in the district of Boa Viagem. Its population, currently around 3,500 people, has been there for decades and is highly organized. Around the shanty there are, besides the shopping mall, commercial and residential buildings, schools, churches and commerce located in the streets that give access to the shopping mall. In fact, it is these uses that are now invading the high value space of the shanty town. The roads at a depth 01, 03 and 04 have a balanced number of occurrences, ranging from 117 to 175 cases, the peak is at depth 02, with 290 cases which is not very far from the average of other cases, and follows the pattern shown in other slums.

Favela 5 is close to a link road with high Global and Local Integration values. Perhaps for this reason, the levels of depth 01 and 02 are those which present the highest crime rate, the latter being the apex of the graph, and had 254 occurrences, a number close to that of depth 01 which had 248 crimes.

Finally the group of shanty towns 6 is very close to the best private schools in the district and to fitness centres, dance schools, vehicle distributors and commercial and residential buildings, thereby justifying the large number of crimes at the levels of depth 1 and 3 from the shanty, which are located exactly where the Colleges with a large flow of people are.

When we analyze the data from all the shanties studied, we can see that the issue "the closer to the shanty, the more dangerous the place" is a myth, and one that is not borne out by the reality of the facts. It is to show prejudice to think that the residents of shanties are bandits. This idea is related to the morphology of these spaces, segregated on account of low intelligibility levels, and into which nobody has access. It is this characteristic which makes this space attractive for and used by people who have broken the law as a shield from or protection against the police.

Improving the access roads or the public interface of the shanty is fundamental if this state of affairs of providing a hiding place for criminals and traffickers is to be eliminated. We should remember that security is an asset desired by the residents of the neighbourhood as well as by the residents of the shanties, which renders it necessary for there to be studies on urban solutions that better address these social-space interfaces.

## **Conclusion**

The survey undertaken, has sought to establish the spatial pattern of crimes in a reality that is very different from that of countries where most knowledge has been produced, that is to say, in a society with a social imbalance, with a high incidence of crime, high impunity and low public neighbourhood policing. One problem faced in this type of research is the shortage of information and the presence of data which is largely unreliable, which therefore restricts studies to the quality information that is available.

This article presents results which sought to verify or demystify common sense notions by the population on perceptions of times of day and dangerous places in the neighbourhood. The increase of crime in the city and the inability of public safety policies to contain the phenomenon, produce a feeling of immense vulnerability that transforms both the space and the habits of sociability and conviviality that characterizes the culture of this tropical region of the country.

One of the assumptions of the authorities is of the lack of logic governing criminal behaviour and the impossibility of foreseeing occurrences. The profile of poverty and the low age of the criminals associated with the use of drugs and hallucinatory agents, fuels the idea of random happenings and the notion that what is worse than having organized crime is having disorganized crime.

The still exploratory results show an association between the various spatial and temporal patterns in the two most common forms of street crime, mugging and theft. The first seeks situations where there is the greatest movement of people, places of passage and readily accessible globally. The occurrences of theft follow a temporal pattern that accompanies activities and every day comings and goings. The local logic is given a potential boost by the presence of activities that generate

movement. Although more detailed analysis is necessary, the results suggest the presence of street crimes of mugging and theft, specific spatial patterns. These could be better understood if there was more detailed data on the criminal incident available, such as the method of approach and the type of get-away.

The socially constructed representation that places close to favelas are likely to be highly unsafe could at least be questioned since crimes increase a lot in regions at medium distance from these areas. That is to say, if the criminals live in the shanty, they do not operate close to home but rather in adjacent areas.

A second conclusion is that the favelas, because of its spatial morphology on which there is little intelligibility but which has great internal control may well be being used as a shield by criminals who are from other places.

However this may be, the results reveal the role of space in determining situations prone to criminal activities. This present research follows describing micro-spatial characteristics with a view to identifying situations of risk and security. The guidelines for urban interventions to be proposed will aim at the spatial empowerment of the local people and recuperating cultural habits of sociability in public spaces so that the streets may return to being spaces for passage and communal living for residents and visitors and not the territory of criminals.

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