

# Urban safety in residential areas<sup>1</sup>

## Global spatial impact and local self-organising processes

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### Abstract

This paper reports some preliminary data, analysis and results that have arisen from the first year of a three-year research project aimed at identifying spatial characteristics involved in urban safety and feeling of (in) security in residential areas. This complex subject is been approached from a multidisciplinary perspective, involving social science techniques, econometric methods and categories from urbanism, combined with a space syntax approach including configurational modelling, space use observation and statistical analysis. The first phase of the project involves the collection of data from six settlements located in an old district of the city of Santiago de Chile with similar social characteristics but with different spatial characteristics

The preliminary results deal with the identification of variables involved in the feeling of insecurity, the contrasting of places that were considered unsafe by the population and those where mugging had actually taken place and the analysis of space use patterns. Rather than provide answers, the results at the moment have helped to clarify the problem, and raise new fine tuned questions.

### Introduction

Violence and crime are social problems present in most –if not all– societies, and have always attracted much public attention. Today is no exception. Much has been argued regarding its origins –it has been associated with inequality, poverty and sometimes genetics– but the general consensus is that it is a social problem of great complexity and of significant importance in the quality of urban life.

Aware of the difficulties in understanding the roots of the phenomena and in offering solutions at that level (overcoming poverty, diminishing inequality or manipulating genetics), the research presented in this paper approached the subject in a way that has been insufficiently explored: the spatial perspective. The choice of this point of view is due to two important considerations. The first is that all social phenomena, and certainly crime and the feeling of safety in residential space, have an important spatial component (Hillier and Hanson, 1984). The second is that the

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seriousness and complexity of the problem requires answers at an operative level, and the residential habitat offers this possibility as it can be manipulated at a relatively low cost offering results in a relatively short term (compared to social variables).

The spatial approach to urban safety is not new. In fact most of the current discussion, although with very different interpretations, can be traced back to the writings of Jane Jacobs in the 1960s (Jacobs, 1961). The ongoing research reported in this paper aims at consolidating a new stage in the spatial approach to residential safety based on the use of space syntax methods (Shu, 1999; Hillier and Shu, 2000; Space Syntax, 2001) complemented by other approaches within a multidisciplinary framework.

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The paper presented here reports some preliminary data, analysis and results that have arisen from the first year of a three-year research project. Six social housing settlements located in the same local authority in Santiago de Chile, with similar social characteristics but with different spatial characteristics, were selected, and the location of assault and robbery, and the feeling of (in)security were studied using social science techniques, econometric methods and categories from urbanism, combined with a space syntax approach including configurational modelling, space use observation and statistical analysis.

### **Variables involved in feeling of (in)security**

The feeling of (in)security was initially studied using focus groups, stated preference and discrete choice modelling. The focus groups carried out (according to age, gender and type of dwelling) helped to identify two main relevant variables in the feeling of security in residential space: visual field (“how much I can see”) and visual control (“how much I am seen”). Each of these variables was decomposed into three attributes: visual field into (i) straight or curved road, (ii) presence of a crossroad and (iii) presence of trees; and visual control into (i) transparency of fences, (ii) presence of a kiosk and (iii) presence of other people. A stated preference experiment with computer abstract representation combining the six attributes was designed and applied to 107 inhabitants of four selected estates. In Figure 1 an example of the type of option that was offered to respondents is presented.

Based on these exercises a two-wave Delphi Survey was designed and applied to 68 Chilean experts. The results show that the attributes related to ‘Social Network’, especially ‘Neighbours Acquaintance’ were considered the most important in giving the inhabitants a sense of security. This is in line with one of the study’s hypothesis which postulates that one of the main sources of insecurity in Latin American culture arises from the ‘stranger’.

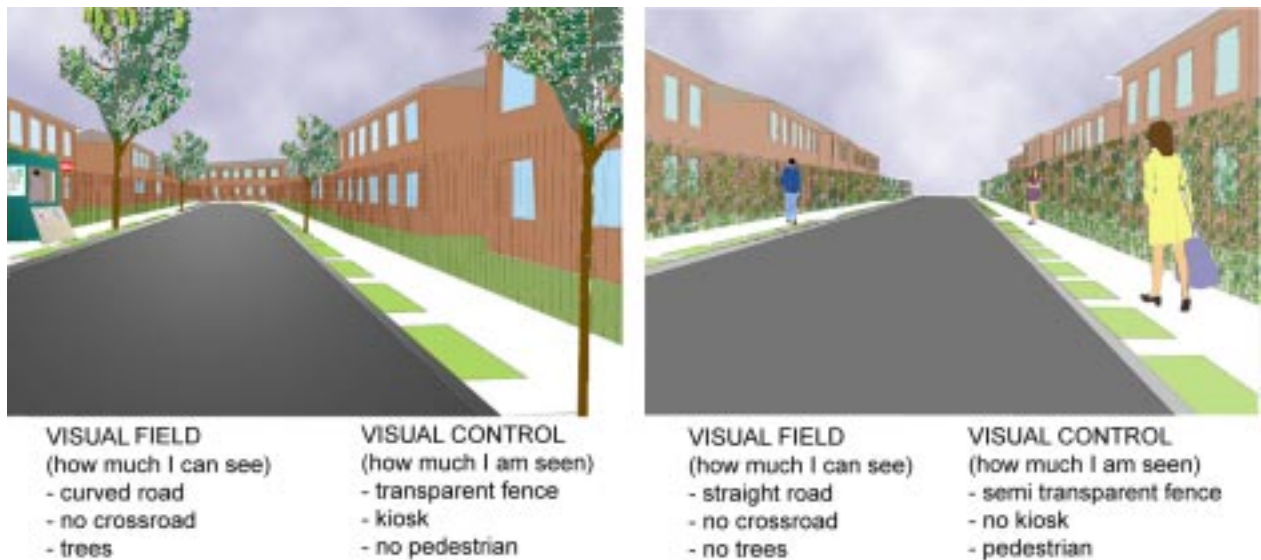


Figure 1: Example of stated preference exercise

The problem may be reduced by transforming the stranger in an ‘acquaintance’, mainly by the creation of a social network. ‘Visual Field’ and ‘Visual Control’ share the second and third place, which favour the co-presence and natural control of public space. Among these, ‘lighting’ was one of the attributes considered most relevant in the feeling of insecurity. This finding is of course in line with those of many current studies and the work of practitioners (see for example the applications of CPTED in Canada, or the work of Sillano, 2002).

### Identification of ‘unsafe’ places and mugging

The second stage of the study involved collecting data from the selected settlements. A thorough observation of the spatial characteristics of the settlements and their surroundings (commerce, urban furniture, public transport, danger focus, type of building, public lighting and more) was carried out and represented in geo-referenced maps. Also, the collection of direct data on crime was considered a first priority as the high rate of unreported crime is one of the usual difficulties in this type of study, together with the inaccuracy of police records regarding precise location of crime. A survey was applied to the inhabitants inquiring on basic socio economic characteristics, robberies and assaults, feeling of insecurity and security measures taken (setting of alarms, not going out at night, leaving lights on and others). The crime data collected involved three types: house robbery, patio robbery (when robbers entered the patio but not the house) and mugging.

In the following figures selected data regarding one of the settlements, Chacabuco, will be presented. Chacabuco is an informal settlement that dates from the 1960’s, and is located in the poor northern sector of the city. It was legalised

through the Neighbourhood Upgrading Programme some twenty years ago, and today presents a good level of consolidation; nevertheless is reputed to have a fairly high level of delinquency.

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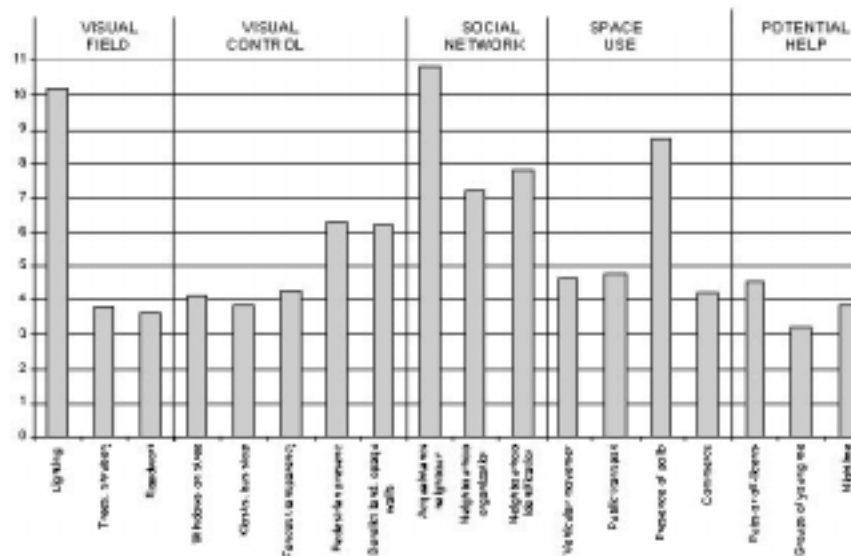


Figure 2: Attributes valuation of (in)security feeling by Delphi experts

Figure 3 shows the reported mugging and the places reported as ‘insecure’ by the inhabitants of Chacabuco. Some observations that can be made from the image are the following:

- i) Mugging seems to concentrate in one specific corner, at the bus stop, but it is not signalled as especially ‘insecure’.
- ii) Mugging is generally located in the perimeter of the settlement and specifically towards the unconstituted end of the main road (in front of a park).
- iii) Although there was almost no mugging reported in the small alleyways, they show a relativity high density of feeling insecure marks. Nevertheless, this data has yet to be analysed in more depth, considering movement flows, so as to calculate a measure of ‘mugging risk’.
- iv) Lastly, there are broad areas reported as insecure where no mugging was reported, raising at least a doubt on the accuracy of ‘common knowledge’.

The survey included several questions on the strength of social networks, such as ‘amount of friends’ ‘desire to move from the settlement’, ‘participation in social organizations’ and others. Based on these answers some social network maps were built coding social networks from stronger to weaker. In line with the results of the Delphi study, the areas with stronger community ties tend to coincide with those declared as most secure. Nevertheless these do not relate to the crime rates, since the alleyway with the highest house and plot robbery is the one with the highest social network and therefore with the highest security perception.



**Figure 3: Reported mugging and insecure places**

**Space use patterns**

Finally, moving and static people were recorded at different time periods during the day, distinguishing between children, young women, young men, adult women and adult men. Moving people were counted through the ‘gates’ technique in two intervals of five minutes each during six hourly periods per day. That is, every place was observed for 60 minutes (distributed from 12:00 AM to 6:00 PM) a day, and the exercise was repeated for two consecutive days (Wednesday and Thursday). Static people were observed through the ‘snapshot’ technique that involves the design of routes that cover all convex spaces. The routes were repeated twice at six hourly periods, that is taking two ‘snapshots’ at every hourly period, during two days.



**Figure 4: Pedestrian movement and static presence in public space**

Figure 4 shows both the moving and static observations. The images show a densely used public space, with a heavy movement flow in the perimeter complemented by a high density of static people, that is using practically all open space<sup>2</sup>.

Nevertheless the most interesting aspects appear when analysing the patterns of movement flow during the day, disaggregating the data by age and gender. Figure 5 shows that movement differs considerably. In particular, the greatest difference seems to be between the 'young men' and the 'adult women' group. While the first show the lowest movement rates during the first counting (starting at 12:00 AM) they rise to the highest during the last counting of the day (at 17:30). Inversely, adult women show the highest early presence (at 12:30) but a mid range presence in the late afternoon (at 17:30 PM). This is important and should be studied further, as previous studies have shown that differential space use by age groups can be a sign of social malaise<sup>3</sup>, while on the contrary the concept of 'virtual community' postulated by Hillier (1996) implies the use of public space by all social groups.

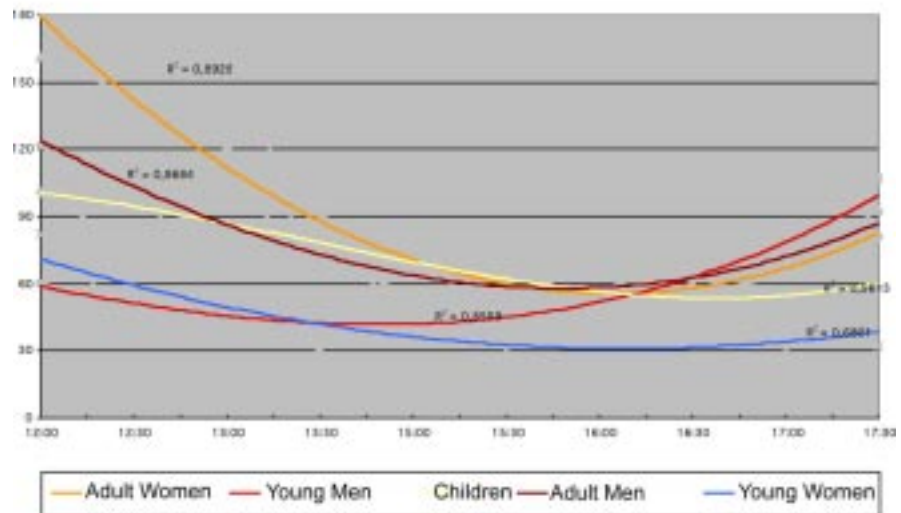


Figure 5: Pedestrian movement by different actors

### Preliminary conclusions

At the moment the research is aiming at answering two different questions that are inter-related: what are the effects, if any, of spatial variables on the occurrence of crime? And, what are the effects, if any, of spatial variables on the feeling of insecurity? Although the answer to the first question would probably allow to lower delinquency rates on residential areas, the second would most probably have a greater impact on the quality of life of urban dwellers, since it affects every day life. Although the research is still in its first phases, the preliminary data shows some interesting insight to these complex problems.

In the first place it must be noted that the areas identified as unsafe by the respondents have little relation to the places where crime concentrates. This should be considered as a sign of alert to revise our beliefs in the most objective possible way<sup>4</sup>. The preliminary analysis shows that crime seems to relate to unconstituted, poorly identified areas that have no clear inhabitants.

Nevertheless the main point here is that the data shows that pedestrian flow fulfils a different role in crime location and feeling of security in a Latin American catholic culture than it does in protestant cultures. The latter have the capacity of facing a stranger as such, and associating for a common goal, while in Latin America the concept of stranger hardly exists. He is either friend or foe. This means that although the pedestrian flow enhances safety, the movement has to be by 'acquaintances', since the stranger is seen with distrust (for further details on this argument see Greene, 2002, based on the writings of Cousiño and Valenzuela, 2000).

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This then brings us to the traditional proposal shared by most researchers and practitioners in the field, that to enhance security it is vital to reinforce community ties. The difference of this research is that it postulates the reinforcement of community ties not as territorial relations in privatised space, but as open relations between inhabitants that share the same residential space in a public realm (without isolating themselves from the rest of the system). This idea is of course related to the concept of 'virtual community' and is quite at odds with concepts such as 'defensible space', which propitiate 'gated communities', reinforcing local ties at the expense of the global relations.

Finally, in this project urban space is being modelled and analysed using space syntax software (at present Axman, High Resolution Axman, Meanda, Depthmap and Evas, but Axwoman, Isovistanalyst and Fathom are also planned to be included). This last perspective will hopefully give the most vital clues in the understanding of spatial variables in crime and feeling of insecurity.

#### **Aknowledgements**

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#### **Notes**

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<sup>2</sup> A special consideration must be made since the measurements were made during school holidays.

<sup>3</sup> An example of this type of phenomena is described as the 'L-shape' effect in Hillier(1996), as it is the

shape that a scattergram takes when two groups of inhabitants occupy space in opposite ways: where one is present the other is absent and vice-versa.

<sup>4</sup> It is important to stress here the difference between raw data on crime occurrence and crime risk, which considers the probability of suffering from crime by relativising the data with real movement flows

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