Experiences of Violent and Property Victimization in Santiago Neighbourhoods:

Multilevel approaches to Social Disorganization theory and new ecological studies of crime

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Ph.D. in Social Policy

The University of Edinburgh

2018

Declaration

Declaration in accordance with University regulations.
I hereby declare that this thesis, titled ‘Experiences of Violent and Property Victimization in Santiago Neighbourhoods: Multilevel approaches to Social Disorganization theory and new ecological studies of crime’ has been composed completely by myself and that the work contained herein is my own except where explicitly stated otherwise in the text. This work has not been submitted for any other degree or personal qualification.

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ABSTRACT

Social Disorganization Theory (SDT) stated that in poor and unstable neighbourhoods, residents may have difficulty developing and maintaining social order, due to the weaknesses of their social networks and the infrequent exercise of informal control. As a consequence, in those areas criminal victimization tends to be high and persists over time. Latin American poor neighbourhoods are often characterised by high residential stability, dense informal networks, strong social cohesion, and yet they often have high levels of violent crime, which constitutes a challenge for SDT. Studies from new ecological approaches have asserted that even if informal networks are weak, neighbours can engage in actions to prevent crimes when the form of intervention is appropriately targeted and the activity is conducted in a partnership with agencies of public control, such as the police or local authorities. Thereby, the general distrust in police and local authorities, and the weak nexus between those institutions and local communities, which characterize most poor areas of Latin-American cities, represent relevant obstacles for the encouragement of neighbours' involvement in crime prevention initiatives.

Despite the low rates of violent crimes in Chile, global figures tend to hide how complex the crime phenomenon is in the country, and particularly in Santiago city. In the capital and largest city of Chile, the distribution of High-Social-Impact crimes is highly unequal with a greater concentration of violent crimes in the most marginalized and poorest districts of the city. In this context is worth asking, *to what extent do neighbourhood structural conditions, community-organizational mechanisms and new forms of public control influence the experiences of violent and property victimization in households of Santiago neighbourhoods?* And, *to what extent do such mechanisms mediate the relationship between structural conditions and the likelihood of being victim of a crime in Santiago neighbourhoods?* To address these questions, the present study draws on an integral theoretical framework aimed at providing a holistic multilevel approach to explaining victimization risk across Santiago neighbourhoods.

Data for this study are drawn from a community-survey of 5,860 persons (from 15 to 90 years old) who lived in 242 selected neighbourhoods of the Santiago city. The survey was conducted in 2010 by the Centre for Studies on Citizen Security (CESC), based at

the University of Chile, in the context of their research project ‘Crime and Urban Violence’. The hierarchical structure of the data (incorporating both individual and neighbourhood level measures) and the adaptation of internationally validated measurements, presents an excellent opportunity to evaluate complex hypothesis with advanced statistical tools.

The research has shown that in neighbourhoods with a high concentration of poverty and low residential stability the probability of being a victim of violent crime is greater than in rich areas. However, when people manifest positive sentiments toward their neighbourhood, perceive collaboration and social cohesion among neighbours, and have positive perceptions with respect to police responses, this largely mediates the negative effects of structural conditions on household victimization by violent crimes, thereby eliminating these effects. These findings have important policy implications. They suggest that in disadvantaged communities it is imperative that police and local authorities not only try to reduce crime through traditional approaches, but also improve trust and engagement of the public aiming to build sustainable partnerships.

LAY SUMMARY

Latin American poor neighbourhoods are often characterised by high residential stability, dense informal networks, strong social cohesion, and yet they often have high levels of violent crime, which constitutes a challenge for sociological theories and crime prevention policies. Studies from new ecological approaches have asserted that even if informal networks are weak, neighbours can engage in actions to prevent crimes when the form of intervention is appropriately targeted and the activity is conducted in a partnership with agencies of public control. Despite the low rates of violent crimes observed in Chile and in the capital, Santiago, global figures tend to hide how complex the crime phenomenon is in big cities. In Santiago the distribution of High-Social-Impact crimes is highly unequal with a greater concentration of violent crimes in the poorest districts of the city.

In this context, advanced statistical analysis were produced using a dataset composed by 5,860 cases (persons from 15 to 90 years old who lived in 242 neighbourhoods of the Santiago city). This analysis searched to answer the question: *to what extent do neighbourhood structural conditions, community-organizational mechanisms and new forms of public control influence the experiences of violent and property victimization in households of Santiago neighbourhoods?* And, *to what extent do such mechanisms mediate the relationship between structural conditions and the likelihood of being victim of a crime in Santiago neighbourhoods?*

Findings of the research has shown that in neighbourhoods with a high concentration of poverty and low residential stability the probability of being a victim of violent crime is greater than in rich areas. However, when people manifest positive sentiments toward their neighbourhood, perceive collaboration and social cohesion among neighbours, and also have positive perceptions with respect to police responses, this largely mediates the negative effects of structural conditions on household violent victimization, thereby eliminating these effects. These findings suggest that in disadvantaged communities it is imperative that police and local authorities not only try to reduce crime through traditional approaches, but also improve trust and engagement of the public aiming to build sustainable partnerships.

ACKNOWLEDGEMENTS

First of all, I must say that this thesis represents the culmination of a dream that arose many years ago, of which I am proud and happy today. It is also the conclusion of a long journey undertaken on my own but through which many have accompanied me, and I am sure that without that support I would not have achieved it. For that, I express here me gratitude to most of that people.

I express my thanks to the Chilean Government (Becas Chile – CONICYT) who granted me with a scholarship that made possible this PhD studies at the University of Edinburgh, School of Social and Political Sciences, and to live in Edinburgh.

I pay my deep sense of gratitude to the Dr Paul Norris and Susan McVie for his dedication and constant support towards my work, for his useful theoretical advices, for his rigorous methodological orientations and for his meticulous work of revision in all the stages of the process, but especially for his understanding and fraternal support in three difficult periods: after the birth of Ernesto, on the return to Chile, and after the birth of Emma. They always made me feel confident that I could successfully finish the process.

My gratitude to the Centre for Citizen Security Studies at the University of Chile, place where I started my professional career, in 2002, and where not only I learned to develop rigorous research but also work with deeply and honest interest in influencing the persistent problem of violence. Especially, I feel deep gratitude to my colleagues and friends, Catalina Mellado and Daniel Fredes, who help me in the last stage of this long journey with valuable literature suggestions and clever methodological advices.

When Javier and I arrived in the United Kingdom, the adaptation process was not easy but we were fortunate to meet good friends, first in London, and then in Edinburgh. Without a doubt Blacket's family was a fundamental pillar for both in the whole process, and for that reason I want to thank you for being there from the beginning and until today. But I especially want to acknowledge my friend Ayleen, because together we started this dream in Chile, together we enjoyed and suffered the whole doctorate, and because she insistently pushed me to finish the thesis until I achieved it. Thank you my dear friend.

Lastly, but not the least, my deeply and sincere gratitude to my parents, René and Eliana, who have always been my main inspiration and example of life. My thanks also go to my sisters, Loreto and Lisset who were part of the beginning of this dream and always trust that I would achieve the goal with success. Mom, dad and sisters I would like to thank you from the bottom of my heart for your patience, support and love.

And, of course, I cannot fail to recognize and thank to my life partner and my great love, Javier, for whom it was not easy to make the decision to leave relatives, friends and work in Chile, but finally he took the decision and made this journey acknowledging that it was not only my thesis project, but also our family project... and that was how, in the middle of the thesis, Ernesto was born, and in the stage of establishing in Chile, Emma was born. My babies, they are today my main reason of proud and happiness. Thank you Javier, for giving me support in the most difficult moments, for enjoying with me the most beautiful part of this journey, and for continuing being part of this venture, our life.

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INTRODUCTION

> *'The victims of crime and the victims of abuse of power, and also frequently their families, witnesses and other who aid them, are unjustly subjected to loss, damage or injury and that they may, in addition, suffer hardship when assisting in the prosecution of offenders.'*
>
> *(*Declaration of Basic Principles of Justice for Victims of Crime and Abuse of Power, adopted by the UN General Assembly on November 29th, 1985)[1]

Since the beginning of victimology[2] as a scientific discipline, between the '60s and the '70s, scholars have attempted to develop theoretical models that provide plausible explanations for the unequal distribution of crime victimization across people and places (Fattah, 2014; Pease and Tseloni, 2014). But unlike other criminological theories, as Fattah (2014) and Meier and Miethe (1993) pointed out, victimization theories emerged closely linked to the development of empirical research, and indeed, thanks to the great amount of data produced by victimization surveys.

Victimization surveys were born as an alternative barometer for crime extent, because they can measure victimization incidence and prevalence, as well as other factors that are not measured by the police, such as perception of risk and fear of crime (Hoyle, 2012; Meier and Miethe, 1993). Since victimization surveys provide information not collected from other sources, their data has made notable contributions to the development of victimization theories. For instance, the British Crime Survey (BCS) has consistently revealed that while the risk of being a victim in a minor offence is relatively high, the risk of suffering a serious crime is low in the United Kingdom (Hoyle, 2012). However, as

[1] http://legal.un.org/avl/ha/dbpjvcap/dbpjvcap.html

[2] Victimology interprets crime as the social relationship between victim and offender, with emphasis on the victim, his/her characteristics and his/her participation in the emergence of the crime event (Fattah, 2014).

Pease and Tseloni (2014) observed, the distribution of victimization risk in industrialized countries is highly unequal, and crime events suffered by some groups are repeated[3].

As Fattah (2014) stated, a great body of literature concerning victims' profiles and the identification of risk factors has been developed since the eighties on the basis of victimization data[4]. However, while some theories are aimed at finding explanations of victimization risk with a particular interest in personal and family characteristics, known as micro-level theories, other theories are focused on explaining contextual or macro-social characteristics which can be associated to the rates of crime.

Among the **micro-level explanations** of crime victimization, two theories have gained a central place in the criminological field for the last four decades: 'lifestyle exposure' and 'routine activity'. *Lifestyle theory* supported the idea that demographic differences in victimization likelihood are attributable to differences in the personal lifestyles and routine daily activities of victims. Thus, people's daily activities may expose them to be in contact with crime events (Meier and Miethe 1993; Hindelang et al., 1978). In a similar sense, the *Routine-Activity theory* argued that people may become attractive targets for motivated offenders when they spend more time doing daily activities in environments where they are exposed to crime, and where they are incapable of protecting themselves (Meier and Miethe 1993). Thus, as Cohen and Felson (1979) argued, the absence of any of these three key elements is sufficient to prevent a crime experience.

Although those theories have relevant differences in the way they conceive the probabilistic nature of the potential causes of crime, both share the idea that a crime event may occur when three elements converge in time and space: 'a motivated offender, an attractive target/victim, and the absence of capable guardianship.' (Pratt and Turanovic, 2016: 336). Thus, both theories provide a situational explanation for crime.

[3] An average of 40% of crime events committed against individuals and households are repeats against targets already victimised in the same year (Pease and Tseloni, 2014: 17).

[4] Before victimization surveys, between the '50s and the '70s, the majority of victimization studies were based on cases studies focusing on specific types of victims and micro-level explanations of crime. Therefore, the emergence of large studies based on victimization surveys, during the '80s, has permitted to expand and diversify the topics addressed within the victimology discipline (Fattah, 2014; INE, 2011).

In this thesis, some demographic and socioeconomic variables linked with lifestyles and routine activities have been examined, in the sense that the presence of those variables may increase 'the attractiveness' or reduce 'the ability of guardianship' of the home or another family member, and, as a result, an increasing likelihood of crime victimization for a particular household is evidenced. However, considering that those micro-level theories have been criticised for their limitations in incorporating macro-level factors in the victimization risk, as Lauritsen (2001) argued, contextual variables have also been examined in the present study. With the aim of overcoming said limitations, in this thesis a 'Multilevel approach' of crime has been pursued.

In the eighties, thanks to the development of victimization surveys, sophisticated statistical tools and new ecological theories of crime, the **'Multilevel studies of crime'** emerged as an alternative approach. Allowing to consider both micro-level and macro-level factors, multilevel studies have contributed to developing a more comprehensive understanding of the victimization phenomenon and its multi-causal nature.

Within the multilevel approach of crime, **Social Disorganization theory** (SDT) has attained a central position in the contemporaneous development of criminological field. In the original version of SDT, Shaw and Mckay (1942) stated that in poor neighbourhoods of Chicago inner city, the heterogenic composition of these areas, the frequent mobility of families and the dysfunctional problems within families, affected families' capacities to supervise youth behaviours and eroded community possibilities to build strong networks and to exert informal controls. According to the revised version of the theory (Kornhauser 1978; Sampson and Groves 1989; Bursik and Grasmick 1993), the weakness of informal and formal networks and the eroded ability to exert informal controls over the community, are the main channels through which neighbourhood effects are transmitted to victimization.

Questioning the validity of the SDT, diverse studies have demonstrated that the effects of informal and formal networks on crime are inconsistent, because these associations are not equally significant across different types of crime. Besides, ecological research stated that nowadays infrequent interactions among neighbours are indeed the usual scenario, and dense ties are not always required to enact social controls. According to

Sampson and colleagues (1997), residents' trust, solidarity and willingness to intervene in common issues, are the required elements to produce effective communities or, as they called it, 'collective efficacy' to prevent crimes. As it will be exposed below, this explanation of victimization has been largely supported by several studies in different contexts, however, findings from Latin American neighbourhoods have refuted this theory, as well as SDT, and this remains to be a challenge for ecological theories of crime.

Based on an alternative approach, authors like Carr (2003) and Velez (2001) have argued that even in a context of weak ties, if residents from poor areas are capable of developing strategic links with authorities and police, they can produce some forms of social controls or 'new parochialism'. This kind of social control, characterized by the partnership between formal control agencies and the community, can significantly contribute to reduce crime victimization. On the contrary, when citizens' satisfaction with police services at the local level is poor, to the extent that police are even perceived as a non-legitimate institution, the residents' willingness to report crime or to collaborate with the police can decrease. As a result, crime victimization will tend to rise. Although there is still limited evidence to support this kind of hypothesis at international level and even less in the Latin American context, this idea leaves interesting questions open for further analysis throughout this thesis.

Even though Chile has sustained a privileged position regarding the high level of violence predominant in other Latin American countries (Latin America being the second most violent region of the world), the general downward trend in criminal statistics contrasts with the unequal distribution of crime, particularly in big cities such as Santiago, the capital of the country. The high levels of socioeconomic inequality and residential segregation, which have characterized Santiago city, explain to a great degree why in some districts and neighbourhoods multiple social disadvantages or vulnerabilities have accumulated in the last three decades. Consequently, violent crimes have increased in such contexts. In fact, some case studies carried out in those neighbourhoods, have demonstrated that greater victimization levels observed in vulnerable districts tend to be even higher in some of the district neighbourhoods. Thus, socially excluded urban territories (districts and neighbourhoods) concentrate violent crimes to a great extent and

in said areas, victims and offenders usually share the same residential area and a similar socioeconomic status.

In order to deal with this reality, diverse institutions and public policies for citizen security at national and local level have been created in Chile since the end of the nineties. Said policies have complemented both control and crime prevention approaches. Those policies and programmes, mainly implemented at the district level, have been oriented towards the development of local management capacities and the generation of plans and projects focused on the resolution of specific local problems. Said experiences have had a relative success thanks to the central role played by mayors, the improvement of information systems, the technical support from the national government and the participation of local organizations, although the lack of continuity and the absence of evaluation mechanisms are still persistent deficits in those crime prevention policies.

By contrast, the public response, focalized in poor and violent neighbourhoods, has shown less significant advances. Security programmes in neighbourhoods, combining control and prevention measures, have emerged so far as a populist response in front of demands from the citizenry and as a reaction to frequent news about violent crime cases appearing on the media - rather than as the result of an accurate diagnosis of the needs existing in certain territories. This situation has been caused, in part, by the lack of reliable information at the neighbourhood level. As a consequence, the design of programmes, the selection process of neighbourhoods and the actions implemented have not been coherent, neither sustainable. Most of the measures implemented have given more value to police-repressive actions and infrastructure investment, leaving behind the necessary development of local management capacities, the involvement of communities and the evaluation of such actions.

The previous theoretical background and, particularly, the crime and public policy background of Santiago city (the capital of Chile) raises two valuable questions: *to what extent do neighbourhood structural conditions, community organizational mechanisms and new forms of public control influence the experiences of violent and property victimization in households of Santiago neighbourhoods?* And, *to what extent do such*

mechanisms mediate the relationship between neighbourhood structural conditions and the likelihood of being a victim of a crime in Santiago neighbourhoods?

To address these questions, the research design of this study draws on a multilevel approach and a secondary data analysis examining the experiences of victimization suffered by a household (and its members) within Santiago neighbourhoods. The cross-sectional data of this study has been taken from a community survey of 5,860 persons (from 15 to 90 years old) who lived in 242 selected neighbourhoods of Santiago city. The survey was conducted in 2010 by the Centre for Studies on Citizen Security (CESC), based at the University of Chile, in the context of the research project **'**Crime and Urban Violence'. Both the hierarchical structure of the data (incorporating both individual and neighbourhood-level measures), and the adaptation of measurements internationally validated, present an excellent opportunity to evaluate a complex hypothesis with advanced statistical tools.

Thus, this thesis was formulated to address nine hypotheses: the first four hypotheses deal with the influence of demographic and socioeconomic variables on the risk of violent and property crime victimization, at the household level. The inclusion of these variables is supported by micro-level theories of crime and a situational crime approach. In contrast, the next four hypotheses are related to the influence of structural conditions and community mechanisms on the risk of violent and property victimization, measured at the household and neighbourhood level. The examination of these variables is supported by multi-level theories of crime and an ecological crime approach.

Lastly, the main hypothesis of the study tested was: 'Even though the structural conditions of some neighbourhoods may be disadvantaged, positive feelings toward neighbourhood, collaboration among neighbours, strong social cohesion and informal control, and a good perception of authorities (police and municipality) can contribute to developing a new form of public control (or new parochialism), and, as a consequence, the risk of violent victimization will be reduced yet not necessarily the risk of property victimization.' To test those nine complex hypotheses, the main statistical tool carried out in the study was the multilevel logistic regression model, specifically applying the approach of 'Random-intercept models'.

Consequently, the core argument of this thesis was that in disadvantaged neighbourhoods with a high concentration of poverty and low residential stability the probability of being a victim of a violent crime is higher than in rich areas. This negative effect is produced mainly because concentration of poverty and residential instability erode residents' sentiments toward their neighbourhood, limit their intention to collaborate with others and their social cohesion, which in turn it is a hindrance to informal controls and the possibility to prevent crimes. In addition, in these poor areas the performance of police institutions is often negligent and inefficient, and for those reasons, residents have negative perceptions about police responses to local needs. In other words, when public policies at the local level successfully promote positive community attachment, reinforce collaboration and social cohesion, and at the same time, improve residents' perceptions towards police, it is more likely that communities may recover their ability to exert informal controls and develop crime prevention initiatives, under a more predictable and safer context. Findings of this study largely supported those ideas and demonstrated that the negative effects of neighbourhood structural conditions on household victimization by violent crimes can be reduced, and indeed eliminated, through the promotion of local, institutional and community resources.

Those are the main contribution of this thesis, which have multiple theoretical and public policy implications. Previous findings suggest that in Latin American disadvantaged neighbourhoods with high levels of crime and weak access to institutional resources, the improvement of police closeness to the community, following a preventive and collaborative approach, is an imperative demand. It is urgent that local authorities and the police not only try to reduce crime through traditional approaches but also improve trust and engagement of the public with the purpose of building sustainable partnerships among authorities, police and community, and in this way contribute to reducing crime victimization. Unfortunately, the fact of resorting to authorities in order to report crimes or to collaborate in crime investigations by neighbours or organizations is often seen by other neighbours as disloyalty, which tends to put at risk those collaborating individuals. Consequently, these acts tend to damage social cohesion.

The foregoing demonstrates that the first initiatives shall imperatively be originated from the authorities and shall be developed with caution, respecting and valuing local resources, but - above all - it shows that the path to follow will tend to be stony and full of obstacles. Said policies shall require a strong political leadership on the part of the local government, to duplicate the efforts for the diagnosis and knowledge of the problems, as well as for the follow-up and evaluation of the whole process with a strong participation of the community. Nonetheless, the specific steps which should be followed by the authorities and the police to build stronger bridges between them and communities, the best way to promote new forms of social controls, and the types of controls that could be more effective in dealing with crime in distrustful and demobilized communities, are questions which required to be addressed in further research.

This thesis is composed by eight chapters. After this introduction, the first chapter provides criminological and public policy context for this study. The second chapter contributes to clear out the theoretical and operational definition of the study unit: the neighbourhood. The third chapter offers the main theoretical background and the literature review which support the questions and study hypothesis. The methodology framework is exposed in the fourth chapter, which includes the most relevant aspects of the dataset and the methods applied. Next, chapters five, six and seven, represent the core part of this thesis, as in those chapters the main study hypothesis is dealt with by using diverse statistical tools. The most important contributions of this study are described in the eighth chapter under the multilevel regression analysis. In the final chapter, the main findings of this thesis are discussed in order to establish conclusions and provide theoretical, practical and policy-oriented implications for further studies.

CHAPTER I. THE CHILEAN AND THE SANTIAGO CITY BACKGROUND: CRIME PROBLEM AND SECURITY PUBLIC POLICY.

I.1. Introduction

This chapter will set out the socio-economic, criminological and public policy context for this study. It will focus specifically on the nature of the Santiago neighbourhoods that are the focus of this thesis, and how they compare to the rest of Chile. Then security public policy will be analysed, outlining those policies which have been intended to improve citizens' experiences in vulnerable neighbourhoods and local policies around citizen security.

The chapter is divided into three sections. After this introduction, the second section of this chapter develops a descriptive overview of the crime phenomenon in Chile and Santiago from 2005 to 2015, based on official statistics and literature revision. In this regard, an in-depth analysis is made regarding the unequal distribution of violence and crime throughout all the country's territories – in particular, large cities such as Santiago. This section also highlights the fact that the unequal distribution of crime is worsened on a smaller territorial scale, i.e. neighbourhoods within districts. The latter facts are the justification to study these phenomena at neighbourhood level which is why they imperatively constitute the object of study of this research paper.

The third section describes the development and status of citizen security policies in the country; an emphasis is given to prevention policies focused on vulnerable districts and neighbourhoods. In this regard, is described the sequence of policies that have been applied in Chile during the last three decades, stating that there have been significant advances concerning the design and management of security policies at the municipal level, but not at security programs focused on neighbourhoods -principally due to the lack of continuity of policies and the absence of evaluation.

I.2. Unequal Crime Distribution in Chile and in Santiago city

This section presents a panoramic review of the territorial distribution of High-Social-Impact crimes (HSIC) in Chile and Santiago, in the last two decades. Firstly, the main trends regarding the reporting rates by violent and property crimes were described, at national level, as well as the trends in the indicators of victimization collected by the National Urban Citizen Security Survey, highlighting in both cases the differences between the averages and the rates observed in specific areas of the country.

Secondly, to show historical trends and to deepen the analysis of the unequal distribution of crime, especially within the city of Santiago, relevant research findings at the national level were discussed. Finally, a comparative analysis of the High-Social-Impact Crimes (HSIC) rates was made, between the districts of Santiago city, which were classified according to their socioeconomic status. From these analyses, the reader will be able to get a glimpse of the criminal reality in Chile and its capital, Santiago, emphasizing its territorial distribution and its associated factors.

I.2.1. Current Crime Distribution in Chile

Within the Latin American region marked by high crime rates, and high homicide rates[5] as a result thereof, crime events in Chile seem to be under control, with low levels of police records for common crimes and low levels of violence in these crimes. Even though in the last decade (from 2005 to 2015) an upward tendency was observed at national level in police reporting rates[6] for High-Social-Impact Crimes (HSIC)[7], within that category

[5] According the World Report on Homicides (UNODC, 2011), Latin America has 9% of the world population and 27% of the homicides, and also 10 of 20 countries with the biggest homicides rates in the world.

[6]Since 1997 the Ministry of the Interior and Public Security has been collecting, systematising and periodically publishing official crime data, including reported cases and arrests made by the two national police institutions. However, in 2010 the Under-Secretariat of Crime Prevention updated statistical reports using a new methodology and adjusting the data from 2005 onwards (*More information at: www.seguridadpublica.gov.cl/estadisticas*).

[7] According to the Chilean police's terminology, the category of property crimes or property theft includes: vehicle theft, theft of car's articles or objects inside, burglary, theft in uninhabited property and another type of theft (except petty larceny or minor theft). The category of violent crimes (sexual and non-sexual) considers: robbery, mugging, injuries, homicide and rape. Finally, the global category of High-Social-Impact crimes (HSIC), defined by the police and the Under-Secretariat of Crime Prevention, includes two previous categories of crimes, namely, violent crimes and property crimes, and add to those the minor theft or petty

while property crimes increased (21%), violent crimes such as injuries, homicide and rape decreased (-37%, -7% and -10%, respectively), and domestic violence diminished (-6%). A similar trend is observed in the Metropolitan Region, where property crimes rates raised and some violent crimes rates, such as injuries, rape and domestic violence, declined (for more detailed information, see Appendix I.1 and I.2) – according data published by Under-Secretariat of Crime Prevention.

Despite the general low rates of violent crimes in Chile, as will be analysed below, global figures tend to hide how complex the crime phenomenon is in the country, and particularly in Santiago city. Crime distribution in Chile is highly unequal with a greater concentration of HSIC in the country's biggest cities. In the year 2015, the Northern-border regions of Tarapacá and Antofagasta, followed by the Metropolitan Region, presented the highest rates of HSIC (3274.4; 3183.0 and 3133.5 respectively), greater than the national average (2,701.3). These same regions have the highest rates in property crimes, as well as in violent crimes, showing in both categories greater levels than the national average.

Since official statistics are not so accurate because of underreporting and other methodological drawbacks, it is important to complement police records with the victimization indicators provided by the National Urban Citizen Security Survey (ENUSC). Data contributed by the ENUSC has revealed a downward trend in the aggregated measure of victimization for property and violent crimes[8] at national level, particularly between 2005-2007 and 2008-2015[9]: The indicator decreased from 36% to 32% between 2005 and 2007, and from 32% to 24% between 2008 and 2014, except in the year 2015 when the figure increased from 24% to 26% (see the Appendix I.1). Furthermore, four regions exceeded the aggregated measure of victimization registered at national level in

larceny. Although domestic violence and drugs-crimes are not directly included in the HSIC category, in the periodical reports produced by the authorities those two types of crime, which also have high social impact in citizens and mass-media, are also informed to the public.

[8] The aggregated victimization is an indicator that represents household victimization in one or more of the following crimes: robbery, mugging, burglary, theft, injuries, motor vehicle theft and vehicle-related theft.

[9] The 2005-2007 and 2008-2015 periods are analysed separately, because in 2008 the sampling frame of the survey was changed, which affects the comparability of the data.

2015 (26.4%): the northern regions (Tarapacá 40% and Atacama 31%) and the central part of the country (Metropolitan region 29% and O'Higgins region 27%).

Nonetheless, at the national level, while most property crimes at household level remained stable in the period 2008-2015, most violent crimes followed a downward trend in the same period, with exceptions in 2011 and 2014-2015[10]. In the Metropolitan Region, from which Santiago city is part, similar trends were observed, but the incidence of victimization by violent crimes is higher than the national means, particularly at the end of the analysed period (for more data see the Appendix I.2). The 2011 episode of upward trend in both Chile and MR might be explained, in part, by the economic crisis suffered in 2009, the 2010 earthquake and the change of national government in 2011. Whereas the upward trend in 2014-2015 might be explained by the worldwide economic crisis faced in that period, which impact on national economic growth and unemployment rates.

The disparity between trends expressed by the complaint rates and by the prevalence of victimization is mainly due to the population represented by each indicator and the method of collection used. Thus, the first indicator only represents victims of crimes who voluntarily went to a police office to state a complaint, with respect to the total population of a given territory. By contrast, the second indicator considers both victimized and non-victimized households within a sample of households, that sample represents the total national population and the population of each region of the country. The image of the delinquency captured by surveys, as ENUSC, is certainly more complete than the one compiled by the Police records, as several authors have stated (Meier & Miethe, 1993; Hoyle, 2012; Aromaa, 2012).

To deepen this analysis regarding the unequal distribution of crime in Chile, and within the city of Santiago, a brief review of the main studies carried out in the last two decades is presented below. As ENUSC began to be applied in 2001, first in a few regions of the

[10] In the period 2008-2015, victimization by burglary crime kept a stable level (around 5%); theft slightly decreased from 9.8% to 9% and theft of vehicle parts or articles inside vehicles decreased from 18.6% to 12.9% - this rate only considered households owning vehicles. Among violent crimes, mugging diminished from 8% to 4.6%, robbery decreased from 6.3% to 4.6%, and injuries from 2.7% to 1.7%. For a more detailed data see appendix 2 (Source: www.seguridadpublica.gov.cl/estadisticas).

country, and only in 2003 at the national level, most of the studies are based on police records. Besides, it is worth mentioning that the ENUSC does not have representativeness at district or neighbourhood level.

I.2.2. Historical Review of High-Social-Impact Crime Distribution in Chile and Santiago

The purpose of this section is to describe how crime and victimization has evolved in Chile in the last two decades, and how it is distributed among socioeconomic groups at national level, and between territories (e.g. cities, districts) with specific characteristics linked to phenomena such as exclusion, segregation and social vulnerability. In particular, it was sought to portray the unequal distribution of victimization experience within the Santiago city, between territories with diverse socioeconomic features. This issue was approached from a brief review of studies carried out in the country, from an ecological perspective of crime, since the end of the '90s.

Crime distribution in Chile. Historical trends

The 1980s and 1990s in Chile were characterized[11] by a noticeable upward trend in police recorded rates for common crimes, particularly property theft crimes (Olavarría, 2006; Dammert & Oviedo, 2004; Frühling & Sandoval, 1997). The highest crime reporting rates were concentrated in regions and cities with the biggest population in the country, such as the Metropolitan Region of Santiago. Besides this, Frühling and Sandoval (1997) and later Dammert and Oviedo (2004), confirmed the way in which crimes were unequally distributed according to segregation patterns within Santiago city. Hence, according to Dammert and Oviedo (2004: 280), considering the total of reported crimes accumulated in the decade between 1987 and 1997, while 50% of theft and 50% of robbery are mostly concentrated in middle and high-status districts of Santiago (From the centre to the northeast of the city, see figure I.1), 50% of homicide and 50% of rape crimes

[11] According to Dammert and Oviedo (2004), the most significant increases in crime reporting rates, both in the Metropolitan Region of Santiago and at national level, were observed between the years 1982 and 1986 within the context of an authoritarian government, economic crisis, high unemployment rates, and increasing inequality.

predominated peripheral and lower-income districts. Dammert and Lunecke (2002) and Olavarría (2006) achieved similar conclusions at national level, demonstrating this relationship between socioeconomic variables and victimization.

In 2002, Araya and Sierra (2002) developed a 'Socio-Criminal Vulnerability Index'[12] searching to identify factors which explain the greater vulnerability of certain territories (districts) in Chile about occurrence of HSIC. They studied 63 urban districts using data from the period between 1998 and 2000. By means of a correlation analysis, the authors demonstrated that those districts with higher levels of social vulnerability presented higher percentages of individuals convicted on account of high-social-impact crimes (Araya & Sierra 2002: 36-37). Subsequently, Araya (2009) updated the Socio-Criminal Vulnerability index by incorporating new indicators, using statistical data from the years 2003-2006 and applying such data to 291 districts[13]. Based on the analysis of this new index, the author made similar conclusions to those for the year 2002, even though the socio-criminal vulnerability index was not so strongly correlated to the percentage of population convicted on grounds of HSIC in the case of those districts which had more rural population and were scarcely populated, which reveals that violent crime is a mainly urban problem, as the literature of the region as stated (e.g., Vilalta, Castillo & Torres, 2016; Araya, 2009; Silva, 2014; Olavarria and Allende 2014; Arriagada & Morales, 2006).

Crime distribution in Santiago city. Historical trends

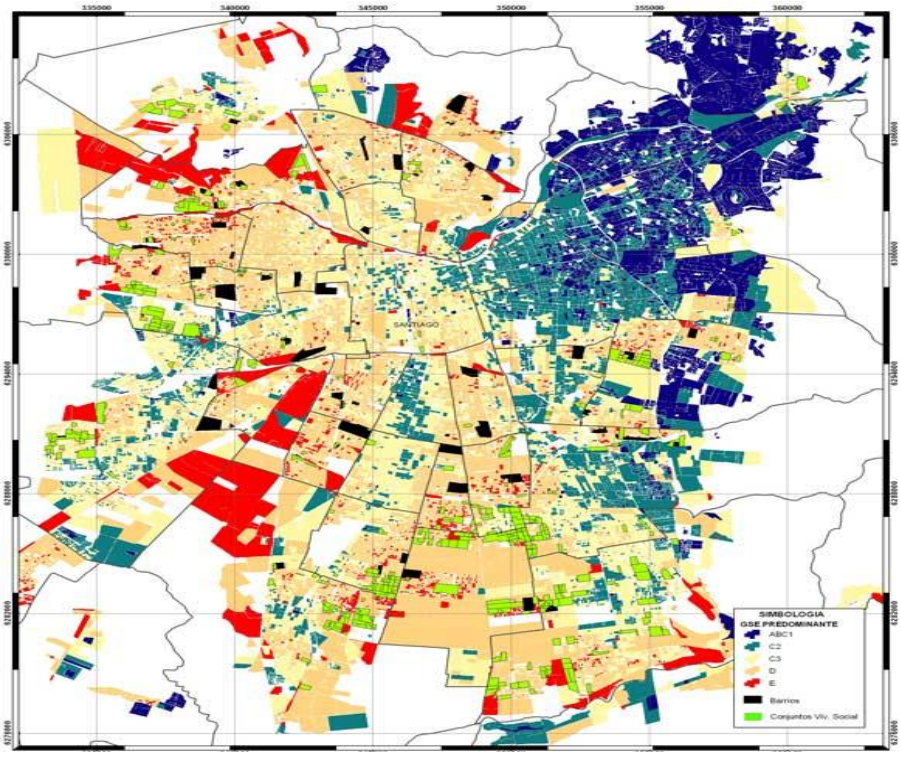
Frey (2009) has found that there is a relevant correlation between the occurrence of certain types of violent crimes and the presence of vulnerability, at the district level in **Santiago city**. To test this hypothesis, the author used the socio-criminal vulnerability

[12] Some of the indicators used by the researchers were the following: poverty indicators (e.g. percentage of population in poverty and percentage of population in extreme poverty); unemployment, educational drawbacks (e.g. number of school years completed, percentage of illiteracy); consumption of legal and illegal substances (e.g. prevalence of alcohol consumption, prevalence of illegal drug consumption); family environment (e.g. rates of domestic violence reports), and demographic profile of the surroundings (e.g. percentage of urban population, percentage of youth) (Araya & Sierra, 2002).

[13]The socio-criminal vulnerability index was composed by 3 factors: a) Factor 1: percentage of urban population, percentage of youth, grade repetition in elementary education in 2006, and score of "Simce" test obtained by second-grade students in high school; b) Factor 2: unemployed in 2003, unemployed in 2006, and percentage of poor people; and c) Inequality (Araya 2009).

index, proposed by Araya in 2009, police records and data from the 2007 National Urban Citizen Security Survey[14]. Domestic violence (crime report rates) has the strongest positive association with the Index, followed by homicide (reports and arrests), robbery (victimization incidence), rape (crime reports) and injuries (reports). On the contrary, there was not any association between property crime and the socio-criminal vulnerability index. Based on those results the author concluded that violent crimes are associated with social exclusion or the relationships among 'marginal people' in the map of the city (see Figure I.1). By contrast, property crimes are linked with the map of inequality, because those crimes are more common in areas where there are clusters of financial, commercial and touristic services, and in rich neighbourhoods (Frey 2009: 10).

Figure I. 1. Map of Santiago city, Socioeconomic distribution of districts



Notation: Blue (ABC1); light blue (C2); light pink (C3); pink (D); red (E); Black boxes (emblematic neighbourhoods); green boxes (social housing neighbourhoods).
Source: Housing Institute, Faculty of Architecture and Urbanism, University of Chile, 2006.

[14] The author used data from the ENUSC 2007 at the district level because, until 2010, the authorities had not recognized that the survey is not representative at this level. After the year 2010 the district level reports were discontinued.

Moreover, based on a study carried out by 'Paz Ciudadana' (Citizen Peace) Foundation and 'Carabineros' Police Force, Blanco (2010: 35) stated that about 35 of the total 346 Chilean districts are the origin districts of 50% of the cases where young individuals were arrested and taken to police stations for offending. These districts, principally located in Santiago City, are characterized by its large population size, high proportion of youth (under 19 years old), high unemployment rate, high residential mobility, low educational and social capital, and the almost inexistence of family socialization practices, among other factors highlighted by international literature. At the same time, Blanco (2010: 10) concluded that while a given district may exhibit low victimization levels, some neighbourhoods therein can double the district's average.

Given the fact that official statistics was not disaggregated at the neighbourhood level, and police records were just disaggregated at district level, a small number of Chilean studies have tackled the issue of analysing the concentration of crime (offenders and/or victims) in specific territories of the country. Just some case studies (using qualitative or mixed methods) have examined the persistent reality of violence and crime in poor neighbourhoods of Santiago, most of them beneficiaries of citizen-security's policies, which are described in next paragraphs.

Lunecke and Ruiz (2007), and Manzano (2009) have stated that violence has worsened in some Santiago neighbourhoods during the nineties and particularly from the year 2000 onwards. This is true mainly regarding economic violence linked to drug trafficking crimes and bearing of firearms.

Based on a diagnostic research carried out in 'emblematic' neighbourhoods of the cities of Santiago, Valparaíso and Concepción, between 2003 and 2006, Lunecke and Ruiz (2007), pointed out that violence in vulnerable neighbourhoods is an everyday practice and is expressed through three dimensions: institutional, economic and social. About institutional violence, residents stated a negative perception vis-á-vis justice and police forces, they perceived them as inefficient, corrupt and, in some cases, abusive in their manner toward poor people, particularly the youth (Lunecke & Ruiz 2007). Concerning economic violence, the authors highlighted both drug consumption and drug trafficking activities take place in public places within these territories, and these activities are linked

to public disorder, fights and other crimes. And, finally, social violence is expressed in high levels of domestic and school violence (Lunecke & Ruiz 2007). According to the authors, events originated from drug consumption and drug trafficking constitute the violence dimension with the highest social impact on residents in the biggest cities of the country (Lunecke & Ruiz 2007).

Likewise, Manzano (2009) made a study case of two vulnerable neighbourhoods in Santiago by means of a mixed methodology between 2007 and 2008. She confirmed that the rates of crime report and arrests due to HSIC in both neighbourhoods were higher than the rates recorded in their respective districts. In particular, as per data provided by 'Carabineros' Police force[15], a significant proportion of violent crime reports within the district corresponded to cases originating in the studied neighbourhoods, that is, robberies, injuries and homicide (60% or more in the case of homicide). This fact becomes more relevant when it is observed that these territories are small both in geographical and population size (Manzano, 2009). According to the author, a great proportion of residents from poor and high-crime neighbourhoods tend to perceive themselves in a condition of high vulnerability of being victims of violent crimes, and also perceive that drug trafficking is one of the most serious problems in their surroundings[16].

In synthesis, based on the previous analysis, the distribution of crimes in Chile and especially in Santiago is highly unequal. Observing a higher concentration of crimes against property in sectors of higher resources, and a greater incidence of violent crimes in low socioeconomic status sectors. In addition, some case studies carried out in Santiago have showed that the incidence of crime affects to a greater extent certain urban districts, but within those districts just few neighbourhoods tend to concentrate higher levels of crime than the district average. In those high-crime local areas, social vulnerability converged with a great incidence of violent crimes, crimes where contact

[15]The records from 'Carabineros' Police force for high-social-impact crimes from 2001 to 2007, both crime reports and arrests, correspond to the areas denominated 'quadrants'. Quadrants have limits similar to those of the neighborhoods under study, yet they are not completely coincident.

[16] According to a survey applied in said study, almost 80% of the participants considered that they were likely to become victims in the first neighborhood; in the second neighborhood, more than 90%. In both neighborhoods almost 100% of the participants stated that 'selling drugs' was a frequent crime in the public spaces.

between victims and perpetrators are common. Thus, given this high concentration of crimes, the study of crime victimization at neighbourhood level is fundamental to understand the criminal phenomenon in the great cities of Chile.

However, as most of the antecedents presented until here refer to the national context, or rather, they are based on studies focalized in very specific contexts, to complement existing evidence regarding the distribution of crime within Santiago, a brief analysis in this line is presented below. The descriptive analysis compares the criminal situation of Santiago's districts using police statistics from 2005 to 2015.

I.2.3. Unequal crime distribution in Santiago City: Analysis of police reporting statistics

With the purpose of illustrating the unequal crime distribution in Santiago City, a comparative analysis is presented below regarding the evolution of crime reports received by the police – specifically HSIC, as well as some specific crimes within this category for the period 2005-2015. This comparative analysis was carried out taking districts[17], as the study units, since the information systematised and disseminated by the Under-Secretary for Crime Prevention (provided by the two Chilean police forces) was disaggregated only for the following levels: regions, provinces, and districts[18].

In the above-mentioned comparative analysis, 33 out of the 34 districts which comprise Santiago City, were classified into four groups. These groups were built based on the percentage of people belonging to each socioeconomic status (from the higher SES called ABC1, to the lower SES D-E). Thus, the first group is composed by districts with a high concentration of people from the lowest status (D-E). The second group is shaped by districts with a medium concentration of poor people and a high concentration of middle status people. The third group is formed by districts with a medium proportion of middle and high status people, and low concentration of poverty. And, the fourth group is

[17]Even though a district is the smallest territorial-administrative unit in Chile and it represents the best approach to the study unit 'neighborhood', it should be recognized that different socioeconomic realities may coexist within each district, mainly in the most populated districts.

[18]See the following web page: http://www.seguridadpublica.gov.cl/estadisticas/tasa-de-denuncias-y-detenciones/.

composed by districts with a high proportion of high status people, and a low concentration of poor people - as shown in the Figure I.2.

Figure I. 2. Socioeconomic Groups of Santiago City's Districts

Group of districts	Cut points (% of people by SES)	Districts
G1, Low status group with high concentration of poor	SES D-E over 60% and ABC1 below 40%	La Pintana, Cerro Navia, Lo Espejo, San Ramón, Renca, La Granja, El Bosque, Lo Prado.
G2, Middle-low status group with medium-level of concentration of poor	SES D-E between 40.0%-59.4% and over 66% C3-D-E	*Pedro Aguirre Cerda, Pudahuel, Conchalí, Recoleta, San Joaquín, San Bernardo, Quinta Normal, Cerrillos, Puente Alto, Quilicura, Estación Central.
G3, Middle status group with low concentration of poor	SES D-E between 39%-26%, C3 over 20%, and ABC1-C2 over 22%	Independencia, Maipú, La Cisterna, **Huechuraba, **Peñalolén, La Florida, Macul, San Miguel, ***Lo Barnechea.
G4, High status group, very low concentration of poor	SES D-E less than 25%, C3-D-3 less than 50% and ABC1-C2 over 30%	Ñuñoa, La Reina, Providencia, Las Condes, Vitacura.
*Pedro Aguirre Cerda belonged to G1 but was re-categorized to G2; **Huechuraba and Peñalolén belonged to G2 but were re-categorized to G3; ***Lo Barnechea belonged to G4 but was re-categorized to G3. Source: Own elaboration based on data of Adimark (2004).		

The Santiago district, which is the core district of the capital city with the same name (also known as "Santiago Centro" or "the downtown area"), was excluded from the analysis because crime levels are well over the average of a province, region, and even the country - due to its peculiar population features[19]. This fact hinders whichever comparative analysis might have been made. The complete list of districts with the associated socioeconomic and crime data can be seen in Appendix I (from I.5 to I.8).

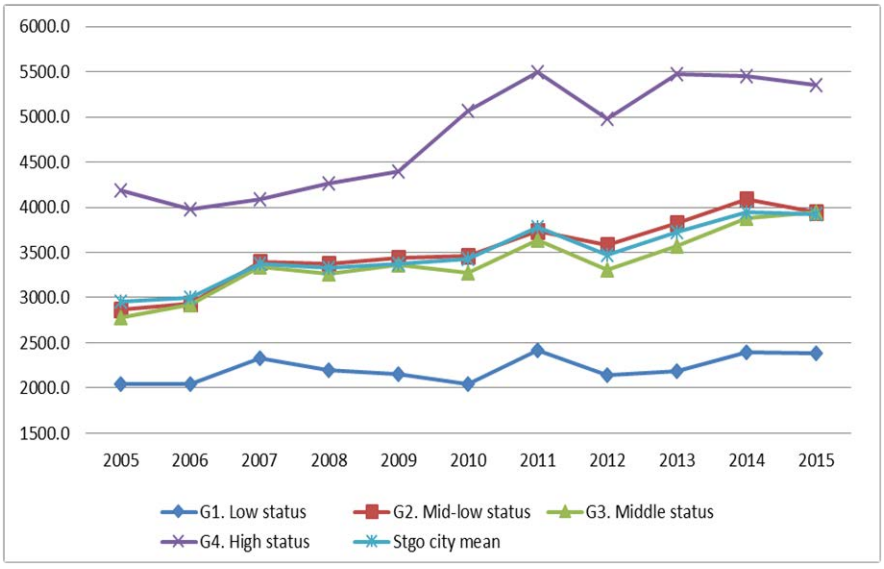
[19] Santiago district is located in the central part of the Metropolitan Region and it is home to the most important State and government agencies, and financial and commercial services. Hence, it attracts a large influx of visitors every day: while there are 358,332 inhabitants (population estimates for year 2015) living in 22 square kilometers, more than two million people circulate within Santiago district on a daily basis. This phenomenon transforms the district into a focal point of crime concentration, mainly offences with economic motivation in public spaces (Source: http://reportescomunales.bcn.cl/2015/index.php/Santiago).

Evolution of High-Social-Impact Crime -HSIC- Reporting (2005-2015)

As it can be observed in Figure I.3, reports for all HSIC, which includes property and violent crimes, in Santiago City have shown an upward tendency with a variation of 33% over a decade period (Variation is equal to: [Final rate - initial rate/initial rate]*100). However, remarkable differences have been evidenced within the city, which is considering groups of districts classified according to the socioeconomic strata predominant among residents (see Figure I.3).

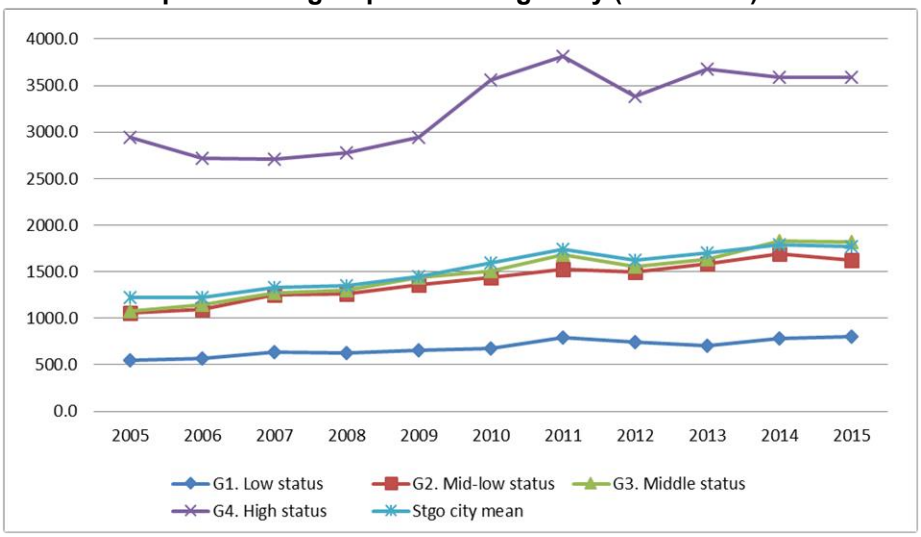
As was said before, between 2010 and 2011 there was a general increase of reports of HISC. This can be explained, in part, by the economic crisis experienced in 2009 and the earthquake of 2010, which impacted on the economic performance and some socioeconomic indicators. Besides, at the beginning of 2011 assumed a new president of the republic, who was from a different political coalition than the previous one and modified the decentralized security policies which was implemented in the previous government period.

Figure I. 3. Report Rates for High-Social-Impact Crimes, per district groups in Santiago City (2005-2015)



Source: Own elaboration based on data Subsecretaría de Prevención del Delito (2016).

Figure I. 4. Report Rates for Property Crimes, per district groups in Santiago City (2005-2015)



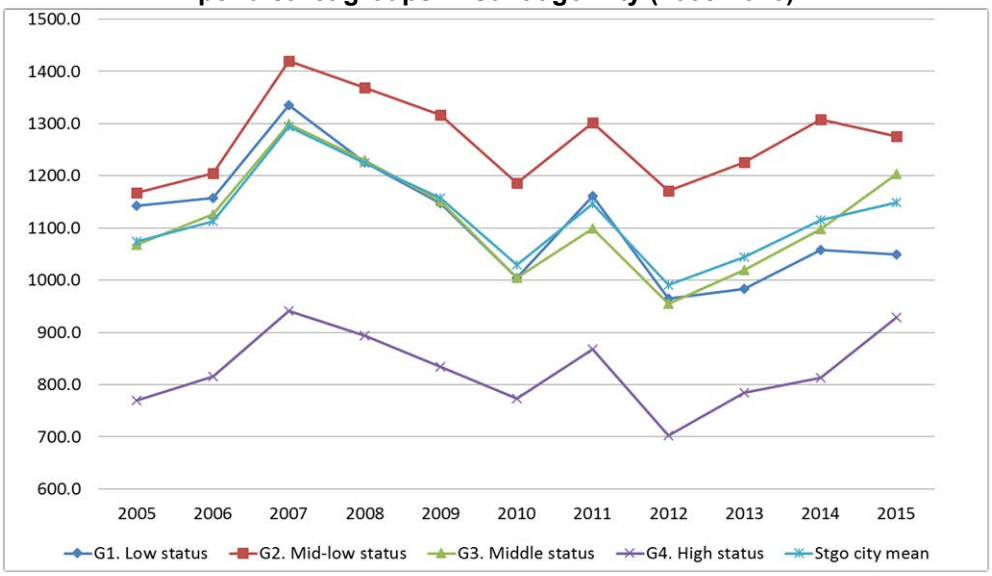
Source: Own elaboration based on data of Subsecretaría de Prevención del Delito (2016).

On the other hand, when reporting rates of **property crimes** are observed (Figure I.4), the district group of high income (G4) presents the highest rates over the period (ranging between 3,000 and 3,500 cases). District groups with middle and middle-low status (G2 and G3) have much lower reporting rates (ranging between 1,000 and 1,800 cases), while the district group with the lowest income (G1) is ranked in the third place with crime reporting rates below 800 cases per 100,000 inhabitants. Even though all district groups follow the same upward tendency of the city's average (45% of variation in the period), significant differences are observed among the groups. Therefore, while G4 shows a variation of around 22%, the G3 presents a variation close to 70%. Likewise, the G2 has 54% of variation, and the G1 has 46% of variation, approximately.

It is worth noting that the marked predominance of high-income districts (G4) in property crimes shows a contrast with the low levels of **violent crime rates** exhibited by this same group, crimes such as 'robbery' or 'homicide'. The category of violent crimes (sexual and non-sexual) considers: robbery, mugging, injuries, homicide and rape. The trends observed in this category are shown in the Figure I.5 and analysed below. After that, a specific analysis regarding the rates of 'homicide' is presented.

As can be observed in Figure I.5, the district group of middle-to-low status, which are shaped by an important proportion of poor people (G2), evidenced the highest reporting rates for violent crimes. These rates have presented a tendency with ups and downs with a clear turning point in the year 2012 when a period of increment began. Just a little behind the G2, we can find the lowest-status group (G1) and the middle-status districts (G3). In the last two groups, the upward tendency is repeated since 2012 even though the G3 group has presented the most noticeable increase (by accumulating a variation of around 13%), while the G1 considering the whole period accumulated a decrease variation of -8.2%. The reporting rates in the highest-status group (G4) are ranked far below the other groups in almost the whole period. However, it is rather evident that the increase trend starting in 2012 and continuing until 2015, accumulating a variation of 21% in the whole period, resulted in the rates of this group being ranked closer to the lowest-status group rates and the city mean (see Figure I.5).

Figure I. 5. Report Rates for Violent Crimes, per district groups in Santiago City (2005-2015)

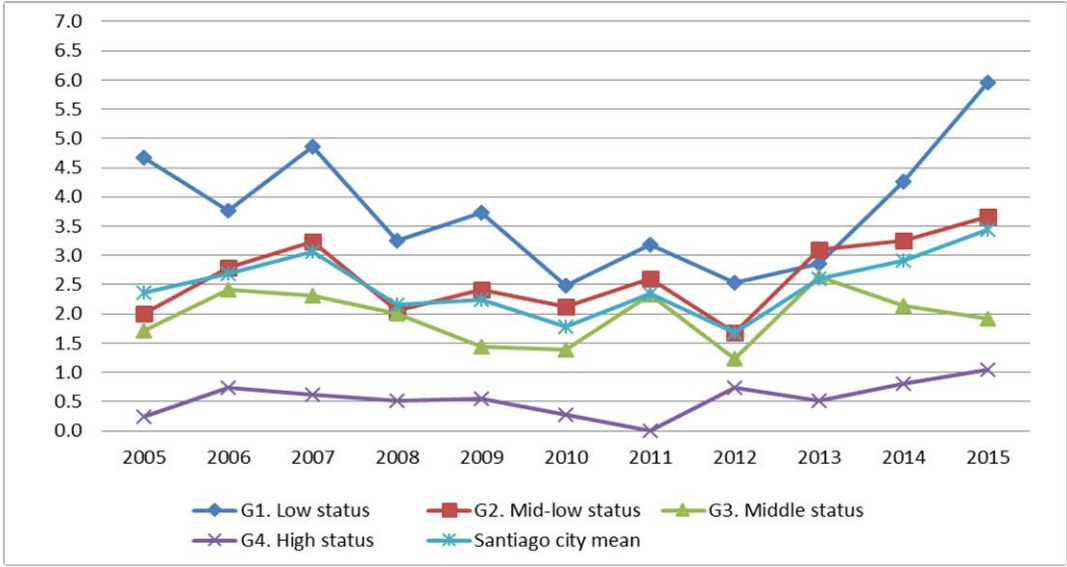


Source: Own elaboration based on data of Subsecretaría de Prevención del Delito (2016).

As regards police **reporting rates for 'homicide'**, the most violent crime with the highest social impact, it is worth mentioning that Chile has low rates in general terms and this fact is repeated in the capital city, where the rate is not higher than 3 cases per 100,000 inhabitants. Despite this fact, as Figure I.6 presents, there are two district groups which present homicide rates higher than the rates of the city's average – that is G1 and G2 -

even though in both cases the observed tendencies are dissimilar. On the one hand, we can see that the G2 group has rates similar to the city's average or slightly higher than the average (ranging from 2 to 3 cases per 100,000 inhabitants) yet with a clear upward tendency all throughout the period and a rather accentuated trend over the last years. On the other hand, the G1 started the period with a rate which was much higher in comparison with the rates of the rest of the districts (a rate of approximately 5 cases). Nonetheless, the rate decreased and kept fluctuating all through the whole period (between 3 and 4 cases). Only in the period from 2012 onwards we can perceive a more noticeable upward tendency, which reached 6 cases per 100,000 inhabitants in 2015.

Figure I. 6. Police crime reports for Homicide per district groups in Santiago City (2005-2015)



Source: Own elaboration based on data of Subsecretaría de Prevención del Delito (2016).

Because of this analysis about HISC reports, it is concluded that crime distribution in the Santiago City districts is highly unequal, as there are remarkable differences as per each crime type under analysis. Thus, when we consider the 'Property crimes', the highest-income districts present crime reporting rates which are higher than those of the other districts. However, the relationship is inverted when the category of 'Violent crimes' are analysed. Therefore, regarding violent crimes, the districts with the highest rates are the middle-low status group (G2), followed by the lowest-status group (G1) and the middle-

status group (G3), but while the accumulated variation of G2 and G3 are positive and high, the variation of lowest-status group is negative which implies a general decreased trend. Whereas, in the case of homicide, it is the district group with the lowest income and with a greater concentration of poverty (G1) the one presenting the highest rates in the whole period and also evidencing a remarkable increase over recent years. After this group, the middle-low group (G2) is ranked in second place, followed considerably behind by the middle-status group (G3) and high-status group (G4). The G3 and G4 show rates lower than those of the city's average in the whole period.

I.2.4. Summary

Based on this review of the current crime trends in Chile, as well as the historical background, it is possible to conclude that a stagnation tendency, even a downward trend, regarding several crimes mainly of the violent kind, has been observed since the end of the first decade of the 2000s. This has taken place after almost three decades of a predominant upward tendency in the reporting rates of high-social-impact crimes (property crimes, in particular). Chile is, therefore, placed in a privileged position within a regional context which is highly violent. However, it is confirmed at the same time that the crime situation in Chile, especially in big cities, is highly unequal. Thus, several studies made between the end of the nineties and the mid-2000s had revealed a greater concentration of property theft in city areas with a large influx of visitors and in areas where middle and high-income groups reside. Likewise, violent crimes were concentrated in sectors where middle-low and low status groups are residents.

Even though the official statistics did not allow to confirm this reality in small territories, several case studies carried out in poor neighbourhoods of big cities have demonstrated that greater victimization levels observed in vulnerable districts tend to be even higher in specific areas. Those neighbourhoods are small territories which become a point of convergence for violence of different sorts. Violence linked to drug trafficking and bearing of firearms is the greatest concern for their residents. In short, socially excluded or vulnerable urban territories (districts and neighbourhoods) concentrate violent crimes to a great extent and, in that territories, victims and offenders from a similar socioeconomic status are brought together by these crimes.

Finally, based on the analysis of the distribution of high-social-impact crimes in the Santiago City's districts, were conclude that crime distribution in this city is highly unequal. Hence, crime reporting rates for property theft tend to be concentrated in higher-income districts, while in the case of violent crimes, such as robbery and homicide, reporting rates are higher in middle-low and low status districts. Regarding homicides, the rates presented by low-socioeconomic-status districts exceed the general average and the rates of other district groups. By contrast, high-status districts have the lowest rates in homicide.

Over the last two decades and until nowadays, several studies carried out in Chile have attempted to evidence this unequal crime distribution in the country's biggest cities, from the Ecology of Crime perspective. As we have already seen, this problem is mainly affecting socially vulnerable districts and neighbourhoods. Unfortunately, most of the studies have been focused on descriptive analyses (quantitative or qualitative) and few of them have delved into the search of causal explanations for the problem by testing theories or hypotheses adjusted to the contexts under study. Therefore, using the 2010 dataset from Santiago neighbourhoods, this research attempt to fill this gap and contribute to a better comprehension of the crime phenomenon which is persistently affecting certain urban territories.

In the next section, the public policy context will be briefly addressed. Since the return of democracy in 1990, several governments have attempted to solve crime and violence problems in the country by means of public policies. This review particularly emphasize on local prevention strategies implemented in districts and vulnerable neighbourhoods, which is presented in next pages.

I.3. Public Policies on citizen security and crime prevention in Chile

This section searched to describe as the public policies on citizen security emerged in Chile, in a historical period of institutional transformation toward the modernization and democratization of the State. This section aims to explain the process under which 'crime prevention' approach started to be integrated within security system in Chile, expanding the responsibilities of formal control institutions, and multiplying the actors involved in the issue - specially the relevant role assumed by the civil society and local authorities. Therefore, in the first part of this section, the general context of the creation/ transformation of institutions and the development of national public policies on citizen security are described. Next, the main programmes on crime prevention, implemented at the local level, are presented and critically assessed based on academic evaluations. Finally, the main programmes of crime prevention implemented in vulnerable neighbourhoods are addressed, mainly because is expected that this thesis would offer suggestions to the improvement of this kind of local policies and programmes.

I.1.1. The historical context of citizen security policies in Chile

The implementation of citizen security policies going beyond the criminal control and prosecution system (police and justice) is a relatively new reality in Chile. Until the end of the eighties, crime prevention, control, and punishment were conceived as the sole responsibility of formal control institutions (Ministry of the Interior and Public Security – Government of Chile, 2014). In the subsequent two decades, security policies started to be broadened by integrating new topics and new responsible actors, considering that local governments, civil society organizations and the whole community may play a more relevant role (Zuñiga, 2010; Dammert, 2004). A similar trend was also observed decades before in developed countries, under a process which Garland (2001) described as the rise of ‘the culture of control’.

Thus, during the period **between 1990 and 1997** security policies were mainly orientated to replace the "National Security Doctrine[20]", characteristic of a military dictatorship, with a 'public security' perspective limiting the role of the armed forces and placing these functions under the aegis of the Ministry of the Interior and the recently created agencies[21]. The first attempt to formulate a national security policy can be dated back to this time: the 'National Plan of Citizen Security' was created in 1994 yet it was never implemented (Dammert, 2004) -see Figure I.7.

In the 90's decade, the main police force in the country[22], 'Carabineros de Chile', started to develop a process of institutional modernization. Therefore, by the end of the nineties, this police institution started to gradually implement the so-called 'Plan of Preventive Security' (Labra, 2011; Frühling, 2003), which is in force until today (2018). This programme consists of dividing the district's urban territory into 'police quadrants'[23] around which human and material resources are distributed – allowing to boost efficiency of preventive tasks at the local level (Labra, 2011: 57).

Even though this programme has a clear preventive approach, having been inspired by community police models in Anglo-Saxon countries, it has not succeeded in strengthening close links with the community, because the programme implementation has not involved structural reforms in the institution, especially regarding its centralized, hierarchical and militarized nature (Labra, 2011: 57-60). In conclusion, based on the National Directorate of Budget (DIPRES) 2007 report and the 2011 report, there was no evidence to affirm that the programme was achieving its goals up to that moment[24].

[20] The National Security Doctrine assumed that the State had to protect itself from an external enemy, represented by socialist countries, and from an internal one, represented by left-wing parties and popular movements. This assumption implied an emphasis on maintaining public order, using institutional violence to eliminate dissident groups against the military dictatorship, and leaving concern about crime in the second place (Dammert, 2004, pages. 264-265).

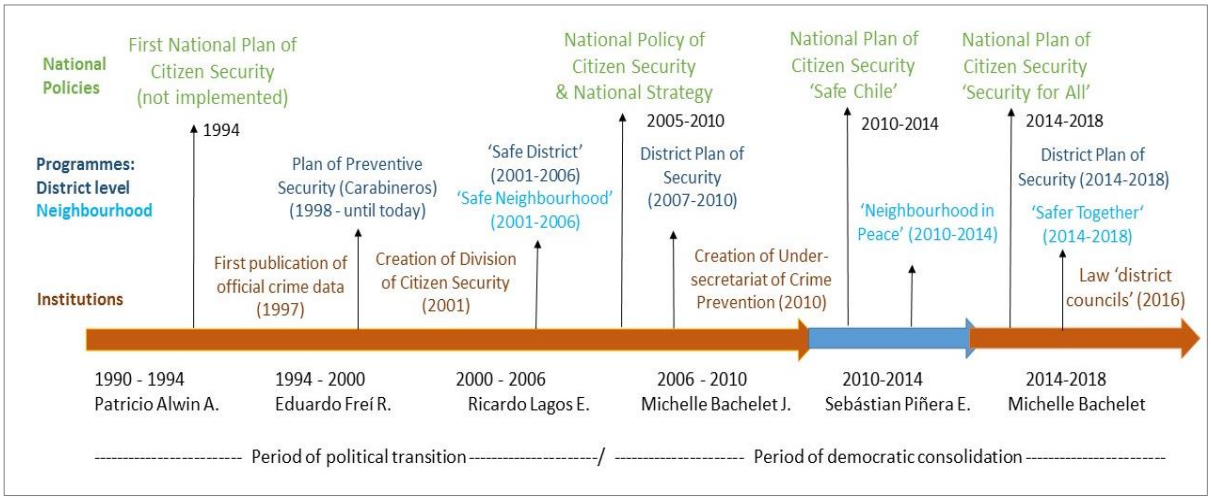
[21] Such as the National Council for Narcotics Control (CONACE), created in 1990, and the Directorate of Public Security and Information (DISPI), created in 1993 (Dammert, 2004, page 267).

[22] In Chile there are two national police forces: one of them is militarized mainly with prevention and public security functions ('Carabineros de Chile'); and the other is civilian with investigation and criminal prosecution tasks (Frühling, 2011). Both compose the Forces of Order and Security of Chile and are dependent of the Ministry of the Interior.

[23] "In order to design the police quadrant, aspects such as the extension in lineal kilometers of the areas to be divided, road and driving conditions, and the biggest distance possible to serve with a police vehicle within an eight-hour patrolling are taken into consideration." (Frühling, 2003: 12).

[24] These reports are available at http://www.dipres.gob.cl/595/w3-article-140457.html.

Figure I. 7. Timeline of Citizen Security Policies and Institution, Chile 1990-2018



Source: Own elaboration based on Dammert (2004), Manzano (2006), Frühling & Gallardo (2012).

Between 1998 and 2004, according to Dammert (2004), citizen security was consolidated as a relevant topic in the government agenda. During this period, institutional reform processes of great significance to the country were undertaken, in the sphere of criminal policies (Criminal Procedural Reform[25], Law on Youth Criminal Responsibility[26], among others). At the same time, authorities initiated an institutionalization process of crime prevention policies, with an emphasis on local management and community participation (Dammert, 2004). In this context, the Division of Citizen Security (DSC) was created in the Ministry of the Interior in 2001. This agency was intended to concentrate the decisions on crime prevention policies and programmes for increased efficacy and coordination (Zuñiga, 2010). In addition, in 2003 the 'National Survey of Urban Safety' (ENUSC) was launched, and since 2003 until 2017 this survey has been applied annually in 14 editions. The ENUSC has been distinguished in Latin America for its long trajectory and methodological rigour (INE, 2011).

[25] The gradual implementation of the Criminal Procedural Reform began at the end of 2000. The Reform implied the transition from an inquisitorial system (written and reserved) to an adversarial one (oral and public). The principles underlying the new system are: impartiality, transparency, immediacy, protection, efficacy, and concentration (Mohor & Covarrubias, 2007: 18).

[26] The debate on creating a criminal system specialized in youth, consistent with the Convention on the Rights of the Child took shape in 2003. In 2005 the Law on Youth Responsibility was enacted, yet it started to be executed two years later due to incapacity of the criminal system to serve this age group (Frühling, 2003: 12). This law is focused on youth being 14 to 18 years old (Soto & Viano, 2007).

The period **between 2005 and present (2017),** is considered the stage of consolidation of the National Citizen Security Policies, but also the period of emergence and consolidation of 'district plans' -as it is observed in Figure I.7-. Thus, in 2005, the DSC launched the first 'National Policy of Citizen Security' (Mertz, 2013; Manzano, 2006). The PNSC was monitored until 2007, and then was reemplaces by the National Citizen Security Strategy (ENSC), which gives continuity to the Policy, and was defined for the government period of Michel Bachelet 2006-2010 (Mertz, 2013). The ENSC was followed by the national plan 'Chile Seguro' (Safe Chile), which ruled during the government of Sebastián Piñera, 2010-2014. Subsequently, with the second period of Michelle Bachelet, 2014-2018, a new national plan of citizen security was launched, called 'Seguridad para todos' (Security for All)[27].

As a synthesis, it can be said that since the 1990s, public policies on citizen security have been able to move from an internal security approach, led by a military dictatorship, to a public security approach according to the democratic regime. Thus, during the first two decades of the twenty-first century, public security policies have advanced in achieving, with relative success, a fair balance between control and prevention measures, emphasizing above all the development of local management capacities (within the Municipality) and in community participation. In practice, however, the implementation of this new approach, citizen security policies, was not without obstacles and difficulties, largely due to the centralist character of the Chilean State, the discontinuity of the implemented programs, and it is still low incorporation of indicators and evaluation systems. Elements to be explored in the next section**.**

I.1.2. Prevention Policies. Local management programmes and plans on citizen security

From the year 2000 onwards, crime prevention programmes started to be developed with an emphasis on community participation. In general terms, these programmes have been aimed at strengthening local capacities to formulate plans and strategies of citizen security which are intended to solve problems in each territory (Manzano, 2003).

[27] For more information about that see: http://www.seguridadpublica.gov.cl/media/2014/10/Plan-Nacional.pdf

By the end of the year 2000, as it is shown in Figure I.7, the programme 'Safe District – 100 Commitment' began to be implemented in 12 districts through the country -as described Manzano (2003). Its purpose was to transfer a local management model of citizen security[28] to the Municipal Government[29] and to the community in the pertinent territory, since this programme stated that the municipality was to be the institution responsible for designing and implementing prevention plans and strategies in citizen security, with the support from the central government and the police forces (Frühling & Gallardo, 2012). Up to that point, said tasks were not the responsibility of municipalities[30].

According to Frühling and Gallardo (2012), the programme implementation was gradually carried out by incorporating 12 districts in the first year, 12 more in the second year, until integrating 82 out of the 346 districts of the country in 2006. This number was lower than the original goal of the programme, which sought to incorporate 100 urban districts with more than 70,000 inhabitans. At that moment, within the Latin-American region, the programme was considered as an innovative proposal for crime prevention at the local level, since it combined three key elements: resource concentration, promotion of a local management model of citizen security, and active participation of the community through project implementation (Manzano, 2003). However, in the year 2006, the programme suddenly finished because of a series of criticisms from politics and public opinion.

Among the criticisms to this programme by academics, we can highlight the funding of projects which were unspecific in nature and which had a rather low impact on crime reduction. The lack of impact evaluation mechanisms can also be mentioned (Manzano, 2009; Bayer & Vergara, 2006). Bayer and Vergara (2006) concluded that the programme 'Safe District' had not had any impact at all on crime indicators and it had solely contributed to build an intangible social capital.

[28] This model was composed by two elements: a professional who develops security diagnosis and plans; and the District Council of Citizen Security, a local body presided by the mayor and integrated by: police officers, representatives of public agencies linked to prevention topics, and representatives of the civil society. This council approves security diagnoses, defines priority areas and selects projects.

[29] A municipality corresponds to a local government entity which is in charge of a district ('comuna') - the most basic territorial unit in the political-administrative division in Chile. The municipality administration is conducted by the mayor who is elected by popular vote.

[30] The Municipal Organic Law of 2006 defines the functions and responsibilities of municipalities and, just as recently as 2016, it was modified to integrate the design of security plans among the municipality tasks.

The programme ‘Safe Neighbourhood’ emerged at the same time as ‘Safe District’ between 2001 and 2002 (see Figure I.7). ‘Safe Neighbourhood’ combined strategies of police control and crime prevention actions with the purpose of reducing violence, crime, and fear in neighbourhoods considered as vulnerable given their poverty conditions, high crime levels, and drug trafficking problems (Frühling & Gallardo, 2012; Manzano 2009). This topic will be dealt with in more detail in the next section.

Furthermore, as a replacement for ‘Safe district’ programme, the ‘District Plan of Security’ programme was created in 2007 (see Figure I.7). The new programme (Frühling & Gallardo, 2012) maintained the figure of *District Council* of citizen security and increase the teamwork responsible of the local programme. In addition, some relevant innovations were made, such as the inclusion of the Support Fund for Municipal Management, as Fernández (2014) highlighted. However, the author argued that the excessive bureaucracy in the process of resource transfer, from the central to the municipal level, hinders, and even makes it impossible, to implement certain projects.

Even though impact evaluations of the ‘District Plans of Security’ were not carried out, Frühling and Gallardo (2012), based on a study from the Inter-American Development Bank, highlighted that crime indicators decreased in those districts where the programme was implemented, particularly of injury and theft. The crime indicators would have been 19% higher without said policy. In the same sense, the greater responsibility given to municipalities is one of the most significant contributions of this programme to the consolidation of local prevention policies, together with a better balance with technical orientations coming from the central level (Fernandez, 2014; Frühling & Gallardo, 2012).

In the year 2010, at the beginning of Sebastián Piñera’s government, who led a right-wing coalition, the programme ‘District Plan of Security’ ended. However, President Michelle Bachelet, during her second term in office, launched the programme again in 2014. The current programme covers 74 districts throughout the country[31]. By the end of 2016, a law regulating the creation of ‘District Councils’ and ‘Plans of Citizen Security’

[31] More information at http://www.seguridadpublica.gov.cl/plan-comunal-de-seguridad-publica/

was enacted[32] (see Figure I.7). By means of this law, municipalities and civil society are placed as relevant actors in the management of public policies on citizen security. Hence, this law is aimed at expanding the creation of District Councils and Plans of Public Security at the national level, integrating those functions in municipal management.

In synthesis, although the implementation of crime prevention policies at the local level had to deal with diverse obstacles, mainly due to the centralist character of the Chilean State and the discontinuity of the implemented programmes (depending on the political position of the coalition in power), the importance of territory focalization, inter-institutional coordination, citizen participation and quality information has been emphasised in national policies. With the recent promulgation of the law that regulates the communal councils, it is expected that these processes will be consolidated, and this policy will acquire a character of state policy that assures continuity. The crucial deficit in evaluation mechanisms for the policy and local plans is a matter that urgently needs to be addressed by the authorities, under this new institutional context.

I.1.3. Preventive programmes focused on vulnerable neighbourhoods

The present section analyses the public security policies focused on vulnerable neighbourhoods applied in Chile during the last two decades. It describes the implemented programs, their succession and main associated evaluations. The relevance of this section is related to the fact that, as the purpose of this thesis is to analyse victimization in the neighbourhoods of Santiago, its findings can nourish the academic debate about it and even more, eventually serve to strengthen neighbourhood security policies.

The programme 'Safe Neighbourhood' was the first public policy of citizen security focused on poor neighbourhoods with high crime levels (see Figure I.7). The programme emerged in 2001 as a response to the public impact provoked by violent events associated to drug trafficking in poor neighbourhoods of Santiago that appeared in the media (Manzano, 2009). In this way, the programme did not have a technical design at

[32] The law is available on: https://www.leychile.cl/Navegar?idNorma=1096337

first - just being limited to implementing repressive (Police) actions in two Santiago neighbourhoods. Subsequently, by the end of 2002, an intervention model was created thanks to a loan and a technical cooperation agreement with the Inter-American Development Bank. This model combined control and intelligence actions by the police with social prevention and investment in infrastructure. The programme was implemented in 12 neighbourhoods all over the country (Martínez, 2007; Manzano, 2009).

The objective of 'Safe Neighbourhood' was: 'to contribute to reduce violence, crime and perception of public insecurity in vulnerable neighbourhoods characterized by the daily occurrence and social penetration of crime phenomena such as drug trafficking, organized crime and violence associated to said events' (Martínez, 2007: 4). This objective was addressed by means of three goals: i) foster actions of police control and intelligence to face crime problems such as drug trafficking, organized crime, and crime violence; ii) recover public spaces by means of implementing better urban infrastructure and security conditions for neighbourhood residents; and iii) foster community participation in the planning and development of preventive actions (Martínez 2007).

The main weakness of this policy, as highlighted by Manzano (2009) and Martínez (2007), is the imbalance observed in the efforts devoted to each intervention line and components: thus, the actions of crime prosecution was favoured to the detriment of the social prevention actions. This affected the programme's sustainability. To this respect, neighbours perceived that the central government did not value their capacities to contribute to the solution of their security problems (Manzano 2009). Another programme drawback mentioned by Martínez (2007) was the poor coordination among the central government, the police forces, the municipality, and the community. Finally, Manzano (2009) and Martínez (2007) recognized as the main weakness the fact of not having implemented an impact evaluation for each of the interventions - even though a base line to carry out said assessment was established in some neighbourhoods.

In 2010, on the change of political coalition in the government, all the previously existent security programs were replaced by new ones. In this way, the programme 'Neighbourhood in Peace', created in 2010, occupied the place of the 'District Safety Plan' (see Figure I.7). The new programme had two intervention lines or sub-programmes,

'Commercial Neighbourhood in Peace' (CNP) and 'Residential Neighbourhood in Peace' (RNP). In total, 68 commercial and 100 residential neighbourhoods were intervened all over the country (Frühling & Gallardo, 2012).

The CNP sub-programme was aimed at "reducing the likely occurrence of crimes, such as situational crimes, interpersonal violence, perception of insecurity and social disorder in neighbourhoods with high crime impact" (Guernica Consultores, 2012: 25). To deal with this objective the intervention included strategies of control, situational crime prevention and community empowerment.

The RNP sub-programme was aimed at "reducing the quantity of households which may become victims of crime, interpersonal violence (domestic violence, school violence, bullying in children and youth), perception of insecurity and activities associated with drug trafficking." (Guernica Consultores, 2012: 25). Unlike the first programme, the intervention lines or components of the RNP sub-programme were not established by the central government; on the contrary, they were defined by the respective municipal government in each case based on a local diagnosis[33]

According to Frühling and Gallardo (2012), for the purpose of selecting the neighbourhoods, the RNP subprogramme combined criteria concerning the following: size of the districts to which these neighbourhoods belonged; and characteristics of crime events in the districts. Additionally, criteria associated with current political issues were considered. On the basis of these criteria, only one of the neighbourhoods intervened by the programme 'Safe Neighborhood' was included in the programme 'Residential Neighborhood in Peace' (Frühling & Gallardo, 2012).

In the year 2012 the National Directorate of Budget (DIPRES) of the Chilean Government carried out a process evaluation of the programme 'Neighbourhood in Peace' with the help of 'Guernica' consulting services. The corresponding evaluation report concluded

[33] Said diagnosis stated the priority risk factors or groups to be intervened. Said factors or groups could be present in the following spheres: children in vulnerable situation; school coexistence contexts; drug and alcohol consumption; situational problems; job difficulties and social reintegration regarding ex-convicts (Frühling & Gallardo, 2012).

that the RNP sub programme had to adjust the selection criteria of neighbourhoods[34], and that it was necessary to review the way in which neighbourhood diagnoses were being made, all this in view to reinforcing community participation in this programme (Guernica Consultores, 2012). The same report established that both programmes had not a proper impact evaluation, neither, did not clearly establish indicators that could allow to measure attainment of the expected results (Guernica Consultores, 2012).

Subsequently, at the beginning of Bachelet's second government in 2014, the programme 'Residential Neighbourhood in Peace' was finished without a final evaluation. It was replaced by the programme 'Safer Together' which is coordinated by the Under-Secretariat of Crime Prevention (see Figure I.7), and by another integral intervention plan in highly complex neighbourhoods in Santiago City, which is coordinated, in turn, by the Regional Government of the Metropolitan Region (launched in 2016). In like manner, the programme 'Commercial Neighbourhood in Peace' was replaced by the intervention programme 'Old City and Civic Centre'. However, up to February of 2017, only information about the programmes' objectives was available on the official web pages of the above-mentioned institutions. No reference could be found regarding the selected neighbourhoods, selection criteria, components and actions to be developed – still less evaluations of the actions implemented between 2014 and 2016.

I.1.4. Summary

As a conclusion, it can be stated that there have been significant advances concerning the design and management of security plans and strategies across Chile at the municipal level. This has been possible thanks to the creation of institutions orientated to these purposes, the central role played by mayors, the availability of information and technical support from the central level and the participation of local leaders in the decision-making. However, the lack of continuity of policies - as well as the absence of

[34]These adjustments are related to overcoming a possible bias in the selection process of neighborhoods deriving from limitations which are typical of police statistics – considering the lack of district representativeness of the National Urban Survey of Citizen Security (ENUSC) and the lack of statistics at the neighborhood level. Furthermore, it is suggested to design a procedure allowing to distinguish complex or critical-phase levels in the insecurity and violence problematics. The procedure would then prioritize or leave out intervention (Guernica Consultores, 2012).

evaluation - is still a persistent problem. In particular, no significant advances have been observed regarding the security programmes focused on neighbourhoods.

Even though scholars (Frühling and Gallardo 2012, and Sherman 2012) has asserted that small areas -such as street intersections or social housing projects- can concentrate disproportionate levels of violence and, then, tailor-made programmes are required in said territories, the lack of reliable information at the neighbourhood level in Chile has limited the possibilities of generating better policies at this territorial level.

In Chile security programmes in neighbourhoods have emerged so far – and to a great extent – as a populist response vis-á-vis current circumstances rather than as the result of an accurate diagnosis of the needs existing in certain territories. For this reason, the selection criteria of neighbourhoods and the design of programmes have not been coherent to some extent. Besides, no recognition has been made regarding the need to transform security policies into (long-term) State policies. This lack of recognition has prevented said policies from having continuity as policies do not survive changes of government coalitions. In the same line, governments need visible short-term results, therefore they have given more value to infrastructure investment and police control, leaving behind social prevention measures. Impact evaluations have been given little relevance or no relevance at all.

I.2. Conclusions

Based on the analysis of the official data, this chapter concludes that in last decade crime victimization in Chile has shown a stable or reducing trend for both violent and property crimes measured through national victimization survey. In fact, Chile is placed in a privileged position regarding the indicator of 'lethal violence' (homicides rates) within a region considered as the second most violent region of the world. Nonetheless, the general good situation of the country in terms of criminal statistics contrasts with the unequal distribution of crime, particularly in big cities such as the capital Santiago. A great number of studies developed during the '90s and 2000 have demonstrated that while property thefts are mainly concentrated in high-income areas and in downtown areas - where the commercial, cultural and touristic activities are highly frequent-, violent crimes

are mostly located in low-income areas of the cities. Those findings were confirmed through an analysis made on police records. The analysis demonstrated that property crimes tend to be concentrated in higher-income districts, while violent crimes are higher in middle-low and low status districts.

Due to the high levels of socioeconomic inequality and residential segregation which characterized Santiago city, in some districts and, particularly, in some neighbourhoods of the city in the last two or three decades multiple social disadvantages or vulnerabilities have been accumulated. Consequently, violent crimes have increased in such contexts. In fact, some case studies carried out in neighbourhoods, have demonstrated that greater victimization levels observed in vulnerable districts tend to be even higher in some of the district neighbourhoods. Other studies have showed that a greater proportion of convicted people by common crimes lived in vulnerable districts. Thus, socially excluded or vulnerable urban territories (districts and neighbourhoods) concentrate violent crimes to a great extent and there, victims and offenders usually share the same residential area and a similar socioeconomic status.

In order to address the phenomenon of the unequal distribution of crime between districts and neighbourhoods of the big city, since the end of the '90s in Chile has been created diverse institutions and programmes oriented under a 'citizen security' or 'crime prevention approach'. Mainly in the last decade, national policies and crime prevention programmes, implemented at the district level have been oriented towards the development of local management capacities and the generation of plans and projects focalized in the resolution of specific local problems. That programmes has had a relative success -in some districts more than others- thanks to the central role played by mayors, the availability of information and technical support from the central level and the participation of local leaders. Nonetheless, the lack of continuity of policies and the absence of evaluation mechanism has been the main obstacles to developing crime prevention policies. The recent approval of the law regulating district councils and district plans of citizen security represents a great opportunity to give these policies a character of state policy which could give them the necessary sustainability to enhance their impact.

By contrast, concerning the high concentration of violent crimes in vulnerable local areas of the city, the public response to poor and violent neighbourhoods has showed less significant advances. Security programmes in neighbourhoods, combining control and prevention measures, have emerged so far as a populist response to citizen demand rather than as the result of an accurate diagnosis of the needs existing in certain territories. This situation was caused, in part, by the lack of reliable information at the neighbourhood level. Therefore, the design of programmes, the selection process of territories and the actions implemented have not been coherent, neither sustainable. Most of measures implemented have given more value to police-repressive actions and infrastructure investment, leaving behind the development of local management capacities, the involvement of communities and the evaluation of such actions.

Attempting to fill the gap concerning the lack of studies which search for causal explanations of the unequal distribution of crime in big cities, and the concentration of violent crime in certain vulnerable territories (neighbourhoods), this thesis will analyse a 2010 dataset from Santiago neighbourhoods, considering multiple household level and neighbourhood level factors which can explain the likelihood of being victim of a violent and property crime at the residential area. It is expected that a better comprehension of the crime phenomenon and its distribution among neighbourhoods can contribute to better design of crime prevention policies at the local level.

CHAPTER II. NEIGHBOURHODD DEFINITION IN THE CONTEXT OF LATIN AMERICAN CRIME STUDIES

II.1. Introduction

As the main aim of this thesis is to understand the unequal distribution of crime in Santiago city, and specifically, to find *what extent neighbourhood structural conditions, community-organizational mechanisms and new forms of public control influence the experiences of violent and property victimization, at household level*, the discussion about the theoretical and operational definition of neighbourhoods is an unavoidable task for this thesis, that will be addressed in the present chapter.

According to Tapia (2013), in Europe and the United States during the past three decades applied urban regeneration policies at the neighbourhood scale have dealt with two great issues: the ambiguity of the concept definition and the problem of its delimitation. The same issues have been observed in Latin America in both urban regeneration policies and crime prevention at the local level (Manzano 2009). In the words of Brower (1996: 17): 'There are many ways of defining neighbourhood' and 'different definitions serve different interests'.

Thus, this chapter aims to establish some basic and generalizable conclusions that contribute to define and delimit the main object of this study, the Santiago neighbourhoods. This serves not only to aid the interpretation of this thesis, but aims to inform similar future research.

From the beginning of the nineteenth century, the term *neighbourhood* has been the subject of theoretical reflections and empirical research being defined in numerous ways. Taylor (2012: 225) offered a useful started point defining neighbourhood as: '*a social/spatial unit of social organization, smaller than a city and larger than a household*'. Other scholars, instead, have erroneously used the concept interchangeable with the

term community[35]. This thesis argues that the direct overlap between place, community and identity, leads to a forced association of the neighbourhood with a specific community, as Tapia (2013) stated[36]. Furthermore, the assumption about different communities can co-exist but not necessarily share the same place, asserted by Massey (1994) and shared by Tapia (2013), is also supported in this study.

Overall, the use of the term 'neighbourhood' is not straightforward because there is no a single generalizable interpretation of it (Taylor 2012; Kearns and Parkinson 2001; Galster 2001). Thus, in the following pages we will try to tackle this problem by answering the following questions:

- How can a neighbourhood be defined? What are the boundaries of neighbourhoods?
- How have neighbourhoods been defined in crime studies within the Latin America context?
- How can neighbourhoods be delimited, under a quantitative or qualitative approach? And, what are their implications for Latin-American studies of crime?

The next section of this chapter addresses the theoretical discussion regarding the definition of 'neighbourhood', from the classical definition of 'natural areas' proposed by the Chicago School of Sociology, until the definition of 'hierarchical-nested communities' proposed by Suttles in 1972 and revisited by Kearns and Parkinson (2001). Critics of both definitions are also discussed.

Later the implications of the previous definitions in the context of Latin America are discussed, particularly the way in which the concept of neighbourhood have been defined and used in the ecological studies of crime in the region and in Chile. Attention then turns to the issue of the methodological delimitation of neighbourhood, specifically how a quantitative approach to neighbourhoods' boundaries have been used in the context of ecological studies, and the advantages and disadvantages of this approach.

[35] 'Community' could be understanding as a group of people linked by dense social ties rooted on personal interactions, interactions which delimited the roles, values and beliefs shared within the residential area, from the classical definition of '*Gemeinschaft*' by Tönnies of 1887 (Tönnies 2001: 22-51).
[36] Communities are mostly heterogeneous and shaped by a diversity of people and interests (Tapia 2013).

The main conclusions of these conceptual discussions, which will be considered as theoretical assumptions, are: i) The neighbourhood is the smallest physical area embedded within the city, and it is shaped by hierarchically nested communities; ii) It is an ecological unit in which people and institutions share a physical space and get psycho-social benefits; iii) In this ecological unit, a collective life emerges from the social relationships that exist among the residents and the sets of institutional arrangements; iv) then, neighbourhood can be a source of opportunity and constraint; and, v) it is an open and modifiable space, where limits are not always clear.

In terms of the operational definition, as the aims of this thesis demanded to count with standardized units of analysis and to allow the generalization of results, the micro-neighbourhood unit was delimited based on Census tracts and geographical limits. Although, the units delimited in this manner are often imperfect, the Census tracts approach is consistent with the notion of nested ecological areas – as it is concluded in the last part of this chapter.

II.2. The Neighbourhood Definition Problem

II.2.1. Neighbourhood as a 'natural area': the Chicago School definition

In a seminal work of the Chicago School, Park (1915: 579-580) defined '*neighbourhood*' as: *a geographical area where people and institutions shared sentiments, traditions and a history of its own*. He argued that neighbourhood is the smallest unit of social and political organization of the city because proximity and neighbourly contact are fostered there. Local interest and associations promote sentiments toward the neighbourhood, and these are, in turn, the basis for participation in political issues. Park (1915) argued, the 'city plan' determines the boundaries and general arrangements of public and private buildings erected in the city. On the other hand, the land values and the location of residential and industrial districts are for the most part defined by the private enterprise. Thus, the city is shaped by a physical as well as a moral organization, and these two components interact and modify one another (Park 1915).

In other words, for the leading exponents of the Chicago school - Robert Park and Ernest Burgess, in 1924- competition is the fundamental form of social interaction that has determined the territorial distribution of populations in the city (Bursik and Grasmick 1993: 6). Furthermore, the dynamics of the competitive market system is part of a natural process or *'biotic order'* from which the existing pattern of land usage and the spatial location of population groups are derived (Bursik and Grasmick 1993: 6).

The 'natural area' approach has been very influential in the field of urban sociology, particularly in studies about neighbourhood and crime between the decades of 1960 and 1980 (e.g. Hirschi, 1969; Crutchfield, Gerkeen, and Gove, 1982; Kelling, 1998). However, this approach has also received serious criticism (e.g. Sampson 2002; Bursik and Grasmick 1993; Castells 1988; Suttles 1972):

Firstly, diverse scholars have questioned the naturalistic vision of a neighbourhood which considers the same as merely born out of a 'competitive' market (Tapia 2013; Bursik and Grasmick 1993; Castells 1988; Suttles 1972). As Bursik and Grasmick (1993) argued, the housing market has often been influenced by diverse factors, such as bureaucracies, political process, population demands and, indeed, illegal land occupation (Bursik and Grasmick 1993: 8-9). For instance, local governments often use incentives to promote developments and to influence residential mobility among neighbourhoods (Bursik and Grasmick 1993; Suttles 1972). In Latin America, on the other hand, political struggles, social movements and illegal land occupation have explained the emergence of numerous and diverse type of settlements.

The second criticism concerns the little attention that ecological research has given to the cultural and symbolic dimensions of the neighbourhood's definition (Bursik and Grasmick 1993; Suttles 1972). To Hunter and Suttles (1972: 47) the idea of a neighbourhood as a single entity with a common history and identity is idealistic and misleading. Lefevre, in 1975, argued the neighbourhood is a component of the city and it cannot be self-explained, it depends on a wider economic, cultural and political process (Cited by Tapia 2013: 6). As Hunter and Suttles (1972; Hunter 1974) noted, residential groups tend to define themselves in terms of relative differences from other groups. But also, some communities received their identity and boundaries imposed by outsiders (Suttles 1972).

In the same sense, Tapia (2013) argued that in a globalized world the neighbourhood cannot be seen as a place associated with a unique community and identity. On the contrary, the neighbourhood is rather an open relational space inserted into the global world, and also, it is home to a vast array of identities.

Taking charge of those criticisms, and trying to develop a more integral definition of neighbourhood, next it is reviewed Suttles (1972) definition as a 'hierarchy of nested communities' is reviewed. The Suttles schema represents the basis over which the definition of neighbourhood, followed in this study, was constructed. Because of the notion of nested areas is consistent with the use of Census tracts as the sampling strategy, and because this has been the perspective followed in several ecological studies of crime (e.g. Sampson and Groves 1989; Sampson et al 1997; Morenoff et al 2001), this is also the operational perspective used in this thesis.

II.2.2. Neighbourhood as a pyramid of nested communities: The Suttles schema

In 1972 Suttles proposed a definition of neighbourhood as a hierarchy of progressively more inclusive residential groups. Thus, a neighbourhood can be seen as ecological units nested within successively larger communities (Sampson et al 2002: 445; Taylor: 225). Ade Kearns and Michael Parkinson (2001), in turn, developed a useful adaptation of the Suttles schema. In this new schema, there are three different scales of neighbourhood: the home area, the locality and the urban district (see Table II.1).

The 'home area' or 'face-block' is the smallest unit of neighbourhood, which covers an extension between 5 and 10 minutes walking from one's home (Kearns and Parkinson 2001: 2103). In this area networks are based simply on the closeness of residence and the use of local facilities (Bursik and Grasmick, 1993: 10). The typical psycho-social functions of this area are making connections with others and fostering attachment and belonging (Brower 1996, cited by Kearns and Parkinson 2001: 2103). As a result, residents may feel more integrated and safer in this area than in areas a bit more distant (Taylor 2012). However, as Kearns and Parkinson (2001) argued, the reciprocity of

'nearness'[37] does not have the same meaning to all people. Meaning can vary from low-level acquaintance to strong interpersonal intimacy, yet both can be relevant to people according to their needs.

Table II. 1. Scales of Neighbourhood

Scale	Predominant function	Mechanism(s)
Home area	Psycho-social benefits (i.e. identity, belonging)	Familiarity Community
Locality	Residential activities Social status and position	Planning Service provision Housing market
Urban district or region	Landscape of social and economic opportunities	Employment connections Leisure interests Social networks

Source: Adaptation of Suttles' (1972) schema in Kearns and Parkinson (2001: 2104).

The home area scale, in turn, is embedded within a named 'locality' or 'nominal community'. This area is recognized by both its residents and outsiders, so *it represents a haven of safety and identification to those living there* (Hunter and Suttles 1972, cited by Bursik and Grasmick, 1993: 10). As Kearns and Parkinson (2001:2104) asserted, as people function in different social networks, at different scales, time and spaces, they may search for different benefits from their home area and from their locality. Therefore, people can develop 'nearness' in the locality as well as in the home area, depending upon where they spend most of the time. Those processes are, in turn, influenced by the physical, social and cultural compositions of localities (Kearns and Parkinson 2001).

The next level of neighbourhood is the 'urban district or region'. According to Bursik and Grasmick (1993), these areas often have institutionalized boundaries and recognized names, and in some cases the nominal community and the urban district may be identical. However, the residents' identification with the official names is dependent on the features

[37] The concept of 'nearness', developed by Heideger, was used by the philosopher Edward Casey in his book *The Fate of Place* (1997) with the purpose of explaining that places are about 'dwelling in nearness' as regards others (nearness entailing face-to-face contact and a reciprocal relationship); and that this 'nearness' brings about neighborhood. (Kearns and Parkinson 2001: 2104, the quotation marks come from the cited reference).

of these areas, and commonly limited (i.e. whether issues raised in those areas are linked to the people's interest) (Bursik and Grasmick, 1993). As Kearns and Parkinson (2001) argued, the urban district can be seen as a place of social and economic opportunities with which some people are more involved than others. However, this area can also be a source of closure, particularly when the place is subject to discrimination and social exclusion (Kearns and Parkinson 2001). In Latin America, this phenomenon is commonly observed in localities of public housing, where the infrastructure is poorly maintained, and the environment is mono-functional[38] - using Brower´s (1996) definition of neighbourhood environment dimensions.

Based on Bursik and Grasmick (1993: 6) synthesis and the work of Kearns and Parkinson (2001), it is possible to summarize that:

i) The neighbourhood is the smallest physical area embedded within a larger area, the city, and, in turn, it is shaped by hierarchically nested communities.
ii) It is an ecological unit in which people and institutions share a physical space and get psycho-social benefits (e.g. sense of belonging).
iii) In this ecological unit, a collective life emerges from the social relationships that exist among the residents and the sets of institutional arrangements, and,
iv) The neighbourhood has a tradition of identity and continuity over time.

Nonetheless, the last idea is a point of criticism. According Kearns and Parkinson (2001) the residents' nearness or sense of belonging can vary according to their needs, and where they spend their time. Thus, for some residents the neighbourhood can be a source of opportunity, where they establish significant relationships and spend most part of their time, but for others neighbourhood is just a constraint (Kearns and Parkinson 2001). As Tapia (2013) argued, the neighbourhood's identity is far from unique or static. The neighbourhood is an open space that can be built and modified in respect to the present, the past and the future, and it is not exempt of conflict and negotiations (Tapia 2013). Taylor (2012) also pointed out that neighbourhoods can change because of

[38] This mean that the residential area is mainly used to sleep due to there is not a good offer of educational and employment places, and neither diversity of cultural and recreational places.

transformations in local organizations and connections between inside-to-outside interests, as well as in neighbourhood boundaries and names. In addition, as Taylor (2012) stated, due to organizational, political and economic reasons, neighbourhoods' boundaries are often imbricated or overlapping. As limits are not always clear, residents may be confused regarding the beginning and end of their local area.

In sum, although a consensual definition of neighbourhood is difficult to establish, this study assumes the three first previous agreements and add two new: iv) *Neighbourhood is an open and modifiable space, where limits are not always clear* (Tapia 2013; Taylor 2012), and, v) *Neighbourhood can be a source of opportunity and constrain (*Kearns and Parkinson 2001).

After establishing those consensual ideas, mainly based on North American literature, some questions emerge: What are the implications of this theoretical definition in Latin-American and Chilean ecological studies of crime? And, what are the challenges still open regarding the neighbourhood definition in those contexts?

II.3. Neighbourhood definition in Latin American and Chilean crime studies

This section examines the implications of the previous definition of neighbourhood in the Latin American context, and discusses the way in which local areas have been defined in ecological studies of crime focused on the region, and particularly, Chile.

In ecological studies of crime and social exclusion within the Latin American context, the notion of neighbourhood has been frequently used without considering a conceptual definition. On the contrary, most of the time the concept has been solely delimited from an operational perspective (e.g. Parraguez 2012; Lunecke 2016; Lunecke 2012; Arriagada and Morales 2005; Dammert and Oviedo 2004). In other words, the debate regarding the problem of neighbourhood definition, as well as its extension and limits, has often not been addressed. No efforts have been made to reflect on the concept definition, its scopes and usefulness in the regional context.

It is possible to distinguish three periods regarding how the neighbourhood concept has been employed in social research aimed at crime and violence in Latin America. The first period goes from the 1970s to the 1990s. It is characterized by the absence of a neighbourhood concept, because studies are focused at country, region and city levels, even though the neighbourhood - as an object of study - is present in other areas of social research, such as poverty and social exclusion (Vekemans, Silva and Giusti 1969; Solari, Franco and Jutkowitz 1976). Secondly, between the end of '90s and the first decade of the 21st century, some studies started to reflect on the dynamics observed within cities from the ecological perspective of crime (e.g. Fajnzylber et al 1998; Arriagada y Godoy 1999). These studies compared smaller districts and territories, even though they still lacked a systematic conceptualization of neighbourhood. Finally, during the current decade, there has been a more systematic and extended use of the neighbourhood concept in crime studies, even though such use consists of the transfer of theoretical definitions that arise from the contextual analysis in the United States (Villareal and Silva 2006; Silva 2014; Vilalta, Castillo and Torres 2016).

During the **first period** (1970-1990), the concept of neighbourhood was mainly addressed from the perspective of studies on poverty and social exclusion, and a reference to crime issues was made only in an indirect manner, solely as a result of impoverishment and marginalization conditions encountered by some population groups, as Vilalta, Castillo and Torres (2016) argued.

In these studies, there was considerable concern among social researchers about poverty and marginalization, on the one hand, and urban development and affordable housing shortage, on the other hand. During the 70's and the 80's, significant research was produced on the migration process from rural to urban areas and urbanization of the main Latin American cities, as well as the conflicting relationship between the city and informal settlements (De Ramon 1990; Espinoza 1998; Candia 2007; Castillo 2010). Furthermore, another group of researchers centred their efforts on analysing the cultural, social, economic and political characteristics of the population living in spontaneous settlements on the city's periphery and defined this population as a marginalized group (e.g. Vekemans, Silva and Giusti 1969; Germani 1980). However, these studies (Vekemans, Silva and Giusti 1969; Solari, Franco and Jutkowitz 1976; Germani 1980)

did not examine the concept of neighbourhood; they merely used the concept as a previously given category - implying that no theoretical definition needed to be made explicit.

Then, during the 80s and 90's, the focus of social research was concentrated on democratizing processes and economic changes. Hence, urban issues lost priority in those decades. At the same time, massive migration to big cities in Latin America started to decrease and natural urban growth became the driving force in urban areas (Candia 2007: 18). Additionally, the increase of land cost led to the implementation of slum relocation policies for poor people. Poor families who lived in high-cost land were relocated to social housing projects built on the periphery (low-cost land). For instance, it is estimated that said slum relocation programmes affected about 65,000 families in Santiago, Chile, between 1979 and 1985 (Rodríguez and Icaza 1993: 139).

In this way, by comparing the characterization of impoverished neighbourhoods described by Latin American studies at that time and the description of American neighbourhoods portrayed by the Chicago studies and the social disorganization theory, it is possible to establish that: 'whereas migrants in the United States came to cities where they had to compete with each other in the market for both housing and jobs, in Latin America, migrants initially provided their own housing through self-construction and many of them found their own jobs through self-and family employment' (Roberts 2011: 416). Hence, structural factors associated with social disorganization in the United States – residential instability, poverty, and social heterogeneity – are not associated to the same forms of social order and cohesion in Latin America (Roberts 2011).

In the **second period**, by the end of the '90s, the issues linked to violence and crime started to be systematically studied in Latin America. However, as these pioneering studies were based mainly on official data, the analysis unit was the country and/or regions, and not more specific local contexts, as Gaviria and Pagés (2002) and Villareal and Silva (2006) critically asserted.

The first systematic studies published in Latin America regarding issues such as violence, crime, and citizen security can be traced to the end of the 90s. They were financed by international organizations or government agencies, such as Fajnzylber et al (1998); Londoño and Guerrero (1999); Arriagada and Godoy (1999); Gaviria and Pagés (2002), Dammert and Lunecke (2002), among others. For instance, Londoño and Guerrero (1999) carried out a descriptive analysis of the dimension and costs of violence in Latin America in a study funded by the Inter-American Development Bank. Therein, the researchers stated that violence, measured by different indicators, was up to five times higher than violence in the rest of the world, and they established that the cost of violence was equivalent to 14.2% of the Latin American GDP. Furthermore, the authors broke down the violence situation per country: they observed that violence levels in Costa Rica, Chile, and Uruguay were lower whereas levels recorded in El Salvador and Colombia were the highest of all. Yet they recognized that the statistical sources available by the end of the nineties were limited and insufficient to carry out a more systematic study on crime distribution within cities and within the local context.

Frühling and Sandoval (1997) were pioneering researchers in addressing the problem of violence and fear in a local context. These authors analysed the reality of crime and perception of insecurity in three districts of Santiago city which were characterized for concentrating high poverty levels. For this purpose, they used socioeconomic data from the 1992 CASEN Survey, crime statistics from the police force “Carabineros”, for the period 1987-1993, qualitative interviews of people involved in the implementation of public policies at a district level and/or participating in non-governmental initiatives of social development, and surveys applied to neighbourhood leaders. In this way, Frühling and Sandoval (1997: 300-301) concluded that “the most vulnerable groups as regards crime are the poorest ones and those living in the newest settlements or those settlements originated from relocation policies during the eighties.” They designed an hypothesis based on the social disorganization theory which suggested that a high concentration of low-income population together with a high level of residential mobility could explain the high crime rates observed in said areas. Hence, both the methodology and the conclusions in the study by Frühling and Sandoval (1997) initially introduced the significance of observing neighbourhood contexts and their impact on violence and crime.

In the **third period**, from the year 2005 onwards, an increasing number of studies on crime came to light. These papers adopted the ecological perspective of crime and, at the same time, gave more relevance to the topic of neighbourhoods (e.g. Dammert and Oviedo 2004; Lunecke and Eissmann 2005; Beato and Peixoto 2006; Arriagada and Morales 2006; Villarreal and Silva 2006; Lunecke and Ruiz 2007).

As information systems on crime and victimization became more consolidated, new studies were made in which the local context (districts and neighbourhoods) was considered as the object of study and in which researchers sought to explain crime distribution by means of social and urban causes as well as public policies, such as Dammert and Oviedo (2004); Beato and Peixoto (2006); Arriagada and Morales (2006), and Villarreal and Silva (2006). Thus, for example, Dammert and Oviedo (2004) combined the analysis of official statistics, victimization surveys and qualitative data with a view to analysing the relationship between segregation and insecurity in Santiago city. They highlighted the existence of specific areas in the city, i.e. districts and neighbourhoods that exhibited greater levels of insecurity. Despite this, these authors did not carry out an explicit conceptualization of the neighbourhood concept.

On the other hand, from a qualitative perspective, the neighbourhood concept began to be used as a unit of analysis in several 'case studies' carried out in Latin America and Chile (e.g. Saraví 2004; Lunecke and Eissmann 2005; Perlman 2006; Lunecke and Ruiz 2007). As an illustration, Saraví (2004) argued that the concept of neighbourhood is intrinsically linked to the notion of local public space. In this sense, ‘it constitutes the most immediate public space, it is the first public encounter, when people unlock their privacy’ (Saraví 2004: 35). In other words, the public space has a fundamental importance in the existence of local communities, because it represents a base for developing collective actions, exchanging goods, information, and other resources (Saraví 2004).

In a similar way, Lunecke and Ruiz (2007: 230) defined neighbourhood as ‘(…) the physical space that surrounds a given group of dwellings as well as the social relationships and interactions produced in it’ (Lunecke and Ruiz 2007: 230). Therefore, in both cases, the neighbourhood definition is close to the description of a ‘home-area’, as the first layer in the theory of ‘hierarchically nested communities’. Unfortunately, as

these qualitative ‘case studies’ are focused on very particular contexts, such as poor neighbourhoods with high levels of crime and drug trafficking, they do not delve into discussing these concepts, nor do they propose their potential application to other environments. This study, instead, aimed to find a neighbourhood definition applicable to different contexts.

In a case study of two Santiago neighbourhoods, Manzano (2009: 24) asserted that “a neighbourhood is an ecological-social unit, defined by processes of identification among residents (social exchanges, common history, and values) and identification with the place (recognition of geographical limits and resources). A neighbourhood may become a community as long as its residents choose to continue living in this place and aspire to achieve common goals (...)” However, the limits of such communities will always be diffuse and instable.

Using the conclusions from those ‘case studies’ as a basis, ecological studies began to approach the neighbourhood context as an analysis unit and as one of the potential explanatory factors of crime and violence in a more thorough way from the year 2010 onwards (e.g. Olavarría et al 2008; Escobar 2012; Valenzuela 2012; Olavarria and Allende 2014; Tocornal, Tapia and Carvajal 2014; Silva 2014; Vilalta, Castillo and Torres 2016). However, most of these studies were still based on theoretical frameworks originated in North America with scarce critical reflections on, or adaptations for, the Latin American context. For instance, Silva (2014) followed the concept of neighbourhood proposed by Bursik and Gramsmick, in 1993, and, consequently, he used the U.S. ‘Census tract’ as the observation unit. Therefore, the theoretical definition of neighbourhood remains subsumed under the operational delimitation in the majority of Latin American studies on crime.

The study ‘Crime and Urban Violence’, from which the data used in this thesis was produced, does not explicitly discuss a definition of neighbourhood, yet it follows the notion of nested communities to some degree and, particularly, the definition of ‘home area’ scale. Thus, Olavarría and colleagues (2008) defined a Micro-Neighbourhood as a small geographical area the size of which is equivalent to a walkable distance of around 15 minutes and where residents can get acquainted with their neighbours, even though

some institutional resources and services might be located outside this area. The same is argued by other authors in analyses which were a result of having used the above-mentioned data (e.g. Olavarria and Allende 2014; Tocornal, Tapia and Carvajal 2014; Fruhling and Gallardo 2012).

It is clear that the previous theoretical definition can be easily translated to an operative definition in a qualitative study, researchers in those studies can ask to residents 'what is the name of your neighbourhood?' and 'where does it begin and end?'. However, the delimitation of neighbourhoods is not a straightforward issue when the study is quantitative, and it is necessary to establish the boundaries of a great number of territories. In this situation, new inquires arise: Which standardized criteria should be followed to delimit the study unit (the geographical, the historical, the political criteria or the residents' perceptions)? Which methods can offer the better approach to delimit neighbourhood limits? And finally, how can scholars delimit the research unit if there is not consensual idea of limits? As an attempt to answer those questions, the delimitation problem in the context of Latin-American and Chilean studies of crime is discussed next.

II.4. The delimitation problem: methodological approaches and their implications

As the definition of neighbourhood is not straightforward, in most of ecological studies of crimes, the 'study unit' is defined by the limitations of an available dataset, so the majority of them delimit geographical boundaries based on Census tracts or block groups – observed by Sampson et al. (2002: 445) and Dietz (2002: 541). Actually, this is the option followed by Sampson and colleagues in several studies (e.g. Sampson and Groves 1989; Sampson et al 1997; Morenoff et al 2001). However, as Sampson (2012) argued, even when census tracts are consistent with the notion of nested ecological areas, this operationalization is commonly imperfect by different reasons –some of these reasons are discussed below.

In most Latin American countries, the lack of crime data disaggregated at local context (districts or neighbourhoods) makes the issue of delimitation more difficult to solve. For that reason, the majority of ecological crime studies are focused at the city or regional

level, and just a few of them analysed the phenomenon at the local level, complementing official criminal data with socioeconomic Census data (for example, Alves Da Silva 2014; Manzano 2009; Villarreal and Silva 2006; Arriagada and Morales 2005; Dammert and Oviedo 2004). Some of these ecological studies of crime had defined the study units based on the census criteria, while others had delimited the study units rooted on the geographical-administrative division of the city. For instance, in the study of Arriagada and Morales (2005) which aimed to establish the link between segregation processes and citizen security in Chilean cities, they used the 'Census districts' as the observation unit. Even though these authors recognize this measurement scale is merely an approximation to the neighbourhood concept, they justify its use in terms of the characteristics of the statistical information available (Arriagada and Morales 2005: 306).

Questioning the use of geographical delimitation of neighbourhoods in quantitative studies, Tapia (2013) and Taylor (2012) asserted that the limits defined by Census tracts are often different from the residents' perception about their area of residence. The ways in which people cognitively interpret their neighbourhood depend on individual, family and contextual factors (Taylor 2012). Consequently, as Taylor (2012) stated, individuals personally construct how and what their residential area is like, and these ideas guide the way that individuals relate to neighbours, local institutions, and their environment[39]. Ethnographies and other qualitative studies offer a better alternative to approach the subjective interpretation of the neighbourhood delimitation. As Tapia (2013) argued, the participants' observation in a local area allows researchers to understand the dynamics of social interactions and the complexity of social life. Besides, as neighbourhoods' limits are linked with daily life and the specific meanings that residents give to the place, ethnography is a better way to approach (Tapia 2013).

Although the qualitative approach has multiple advantages over quantitative approach in respecting residents' own perception of neighbourhoods' boundaries, qualitative studies disregard the possibility of establishing standardized criteria for neighbourhood delimitation. In addition, both the comparability of results and the replicability of studies are hindered under a qualitative approach.

[39] As Kearns and Parkinson (2001) exemplified, a person can have a multiple neighborhood membership depending on where they spend most of their time: the church, the school, the workplace. In each place, they develop social relations and every membership can play a role in their lives.

Therefore, as the present study seeks the factors associated to household victimization, across different types of Santiago's neighbourhood; the need to delimit standardized units of analysis and to allow the generalization of the results compel us to use a quantitative approach to delimit neighbourhoods. For that reason, this thesis uses the data set of the research 'Crime and Urban Violence in Santiago neighbourhoods', where the study unit was mainly defined through a quantitative approach based on geographical limits and Census Data. In that study, the neighbourhoods comprise an area between 6 and 9 census blocks on average (Tocornal et al. 2014: 88).

Nonetheless, it is worthwhile to recognize that neighbourhood boundaries defined solely based on a quantitative-geographical approach are imperfect because they do not consider historical, cultural, political and economic factors, which also contribute to the real delimitation of local areas. Due to these kinds of factors, neighbourhood limits are often overlapping and change over time, as Taylor (2012) argued. To deal with this issue, some studies have used a mixed approach, complementing the geographical delimitation with qualitative data, such as interviews or participant observation (e.g. Lebel et al. 2007; Raudenbush and Sampson 1999). Qualitative data has been used to correct or validate the neighbourhood delimitation as Tapia (2013) said.

Unfortunately, in the Santiago neighbourhoods' study from which the secondary data was obtained, the neighbourhood delimitation was not corroborated through qualitative information. However, in that study observational data was collected to complement survey information about certain issues (e.g. quality of public places, physical and social disorder, etc.)[40]. In addition, some questions of the community-survey addressed the neighbourhood boundaries and its features (Tocornal et al 2014; Olavarría, 2014). The analysis of these answers, included in the Data and Methods chapter, can help to confirm or to redefine the conceptualization of neighbourhood developed in this chapter.

[40] This observational information was produced emulating the methodology of the Systematic Social Observation (SSO) -developed by Raudenbush & Sampson (1999)-. This consists in measuring certain characteristics of the environment using tools such as videos, photographs and direct observation. Subsequently, the information is codified, georeferenced and analyzed by statistical software, allowing reaching a greater knowledge about neighborhood features.

Although, according Taylor (2012), no single layer or methodological approach to define limits is correct for research or policy purposes, the spatial scale chosen to represent a neighbourhood should match the spatial scale of the phenomenon, and their diverse manifestations, which is attempted to be tackled. For instance, if the policy concern is focused in crime levels, the definition and delimitation of areas should be consistent with police resources (needs and distribution) and residents' perceptions regarding the issue (Buslik 2009, cited by Taylor 2012: 226).

On the other hand, it is worthwhile to highlight that whatever approach is taken to establish the boundaries of a neighbourhood, in all cases it must be recognized that these boundaries are not fixed, they may change over time (Taylor 2012). So results obtained in a moment of time cannot be generalizable to the future, and in some cases longitudinal studies, which estimated territorial changes, can be the most accurate approach. In addition, neighbourhood boundaries are usually permeable, since behaviours are often potentially contagious (Sampson et al., 2002). For example, crime in a neighbourhood can be a cause or effect of social processes produced in nearby places, as well as criminal tendencies in an area can affect people's perception of security in adjoining neighbourhoods (Sampson et al., 2002). In that sense, the dataset analysed in this study cannot observe this changes over time because of the cross-sectional nature of it.

In sum, as Dietz (2002) recognized, the neighbourhood delimitation is not a trivial issue, because this can have a significant impact in the outcomes obtained by empirical research. In the same sense, Sabatini and colleagues (2001) argued, the definition of the observational unit not only imply a risk of 'methodological bias', but also they can impact on study' findings, in fact with a wrong definition of the study unit the researcher could be measuring a different phenomenon.

II.5. Conclusions

In synthesis, although there is not a single and consensual definition of neighbourhood, based on the literature review this study assume that: i) The neighbourhood is the smallest physical area embedded within the city, and it is shaped by hierarchically nested communities; ii) It is an ecological unit in which people and institutions share a physical

space and get psycho-social benefits; iii) In this ecological unit, a collective life emerges from the social relationships that exist among the residents and the sets of institutional arrangements; iv) then, neighbourhood can be a source of opportunity and constrain; and, v) it is an open and modifiable space, where limits are not always clear.

Within the Latin American context, particularly in ecological studies of crime and social exclusion, the concept of neighbourhood has commonly been used without a prior reflexion about the definition or the better approach to establish their limits. Thus, most of these studies are still based on theoretical definitions originated in North America and, only few of them, have made serious efforts for adapting such concepts to the Latin American context or for discussing respect the scopes and usefulness of those definitions. As a consequence, the theoretical definition of neighbourhood, in most ecological studies of crime, remains subsumed under the operational delimitation and the data availability.

Although it is questionable that much of the research that considers neighbourhood as a unit of analysis does not tackle the issue of definition, and only assume the geographical-administrative delimitation, it is necessary to emphasize that, when trying to define the concept, quantitative studies faced with methodological obstacles hard to be solved. On the one hand, moving from theoretical definition to an operational definition is difficult to achieve when it is necessary to establish standardized units of analysis and to allow the generalization of the results (respecting sampling design).

In addition, in the Latin American region disaggregated data are not always available at different geographic-administrative levels (cities, districts or neighbourhoods) - unlike what happens in developed countries (e.g. the United Kingdom)-, this prevents working with units of analysis closer to the actual political-administrative structures. This is diametrically different from the methodological flexibility inherent in the case studies in particular, and qualitative studies, in general, which do have the possibility of considering the neighbourhood as a unit of analysis and unit of observation, which can be delimited during the research process itself.

As the present study aims to establish which household and community factors are associated with the experience of household victimization, across different types of neighbourhoods (within Santiago city), the need to count with standardized units of analysis and to allow the generalization of results, forces the use a quantitative dataset, from the research 'Crime and Urban Violence in Santiago Neighbourhoods'. In this study, the neighbourhood was mainly delimited based on Census tracts and geographical limits – the description of this operationalization is included in the 'Data and Methods' chapter. Although, the international evidence has demonstrated that the study unit delimited in this manner is often imperfect, the Census tracts approach is consistent with the notion of nested ecological areas.

CHAPTER III. THEORETICAL BACKGROUND AND STUDY HYPOTHESIS

III.1. Introduction

Attempting to answer the research question, regarding the influence of multiple factors on the experiences of violent and property victimization in households of Santiago neighbourhoods, the present 'Theoretical Background' chapter highlights micro-level explanations, as well as multilevel explanations of crime victimization. The complementarity of both perspectives provides an integrated framework to understand a phenomenon, which is in essence multi-causal and, for that reason, should only be examined based on a probabilistic point of view. Based on theory, study hypotheses are identified and described at the end of each section.

Within the micro-level explanations of crime, two theories have dominated the victimology field for the last four decades, 'lifestyle exposure' and 'routine activity'. These theories were created between the end of 1970 and the beginning of 1980s in the context of the emergence of the victimization surveys, so they were strongly supported by the empirical evidence, as opposed to many classical criminological theories which were often based on assumptions. The main contributions of these theories and the risk factors derived from them are addressed in the second section of this chapter. However, as several authors have argued, victimization studies that mainly focused on individual factors probably achieved biased conclusions, especially if they ignored the fact that crime is not randomly distributed in the local context.

By contrast, multilevel approaches to crime victimization highlighted that both individual factors and macro-social factors contribute to explain the increase in the likelihood of crime victimization. The central place of the macro-social explanations of crime has seen a significant development mostly due to the renaissance of Social Disorganization Theory (SDT), the emergence of community-surveys and hierarchical data modelling. In the last two decades, new ecological studies have also made significant contributions in the understanding of victimization under a multilevel approach.

SDT essentially states that neighbourhood structural conditions, such as poverty, residential instability and ethnical heterogeneity, affect a community's capacity to realize common values and maintain social order, through the social controls exerted by private and parochial networks. Consequently, within these disorganized communities crime victimization increases and remains high over time. Offering a critical but also renewed vision of SDT, more recent ecological studies on crime have stated that infrequent interactions between neighbours are more common than frequent, and these kinds of relationships may have stronger effects in the reduction of crime. In this sense, the Collective Efficacy Model (CEM) proposed that social cohesion combined with neighbours' willingness to intervene in local issues contributes to develop an 'effective community capacity to prevent crime'. Although a great body of international literature has supported the CEM, findings from Latin-American studies have dismissed the validity of the theory in this context - as discussed in the **third section** of this chapter.

In the **fourth section**, ecological studies asserted that even in contexts of weak ties, if some residents are capable of developing strategic links with resources outside the neighbourhood, they can produce a type of informal control, which they called 'new parochialism'. This form of social control consists of an interplay between formal control and informal control. In poor areas of Latin-American countries were police agencies are mostly perceived as negligent, inefficient, corrupt and unfair the possibility to build police-community partnership are challenging. In Latin-America and Chile there is still little evidence to support this ecological hypothesis, which would offer a multi-causal/multilevel explanation of crime victimization and valuate the role of public control institutions. Therefore, the present study aims to fill this gap, making a significant contribution to the understanding of crime distribution in Latin-American cities and neighbourhoods. I**n the summary section**, the main conclusions of the previous discussion are expressed.

III.2. Micro-level approaches to explain victimization risk

In this section, the most common micro-level theories of crime victimization, 'lifestyle exposure' and 'routine activity, are described. The main contributions, the individual or household-level factors examined in this thesis, as well as the main limitations of these theories, are discussed here.

III.2.1. The contribution of lifestyle and routine activity theories

According Pratt and Turanovic (2016), two micro-level theories have dominated the research about crime victimization for the last four decades, 'lifestyle exposure' and 'routine activity'. The main contributions of these theories, concerning the probabilistic view and the multi-causal nature of the victimization phenomenon, are analysed below.

Due to the frequent and extended use of those theories in the criminological literature, as Pratt and Turanovic (2016) argued, they have often been used in an interchangeable form or within a single 'lifestyle/routine activity' framework. There are three reasons to explain the link between these two theories. Firstly, both theories share the idea that a victimization event comes true when there is a "convergence in time and space of a motivated offender, and attractive target/victim, and the absence of capable guardianship." (Pratt and Turanovic, 2016: 336). Secondly, both theories share some key concepts, after Hindelang et al. in 1978 defined lifestyle as "routine daily activities, both vocational activities (work, school, etc.) and leisure activities" (cited by Meier and Miethe, 1993: 466), Cohen and Felson (1979) coined the concept of 'routine activity'. Thirdly, as Pratt and Turanovic (2016) pointed out, a great body of empirical evidence has revealed that the complementarity of both theories has made a significant contribution in the understanding of victimization for various types of crimes (see, e.g. Turanovic and Pratt, 2014; Brookman and Robinson, 2012; Schreck and Fisher, 2004).

The *Lifestyle exposure,* which was the first systematic victimization theory, was developed by Hindelang, Gottfredson and Garofalo in 1978. The basic premise of this theory, as Meier and Miethe (1993) described, is that demographic differences in the likelihood of victimization are attributable to differences in the personal lifestyles of victims, and the lifestyle is mainly shaped by the 'routine daily activities'. Thus, people's

daily activities may expose them to be in contact with crime events or risky activities (Meier and Miethe, 1993; Hindelang et al., 1978). For instance, Brookman and Robinson (2012) said, according to 2010 BCS data, young people have higher risk of being victimized by violent crimes than older people, and even more when they are males. That happens because young-males are more exposed to risky places and situations, such as living alone, go out drinking at night, among others (Pratt and Turonovic, 2016; Brookman and Robinson, 2012).

Nevertheless, as Pratt and Turonovic (2016) criticized, a great proportion of published studies based in lifestyle theory seem to believe that Hindelang et al. (1978) were mainly interested in to establishing which demographic characteristics are more correlated with the likelihood of a person of being victimized. But the demographic features were not the main concern for Hindelang et al. (1978); those factors were only relevant to the extent that they would be associated with *risky behaviours,* which would increase the likelihood of victimization.

Therefore, according to Meier and Miethe (1993), based on this theory studies may conclude if demographic differences in victimization risks are due to differences in lifestyles, so the influence of demographic variables should have decreased in significance when specific measures of lifestyle or routine activities were included in models. In addition, Meier and Miethe (1993) argued that persons who accumulate diverse characteristics associated with a risky lifestyle may have, on average, greater risk of victimization than another persons' profile.

On the other hand, the *routine-activity* theory, developed by Cohen and Felson (1979), is another classical theory of victimization focused on victims' profiles and micro-level explanations for crimes. In this theory, changes in routine-activities may affect crime rates when there is convergence in time and space of three key elements: motivated offenders, suitable targets, and the absence of capable guardians. According to Meier and Miethe (1993), people become attractive targets for offenders when they spend more time in environments where they are exposed to crime, and, when they are incapable of protecting themselves.

However, ‘the lack of any one of these elements is sufficient to prevent the successful completion of a direct-contact predatory crime.’ (Cohen and Felson, 1979: 589). In the same sense, Clark and Felson (2011) have recently argued that there is no need to test the strength of the association between measures of crime victimization and variables linked to ‘Routine-Activity’ theory, as criminological studies normally do. In consequence, it is clear that the authors of this approach were not really interested in establishing the greater or lower likelihood of being victimized for a person or household, but instead they were only concerned with *describing* the victimization event itself, as Pratt and Turonovic (2016) stated.

Based on the previous analysis, it is possible to conclude that there is a significant difference between the ‘lifestyle exposure’ and ‘routine activity’ theories regarding to how the risk of victimization is interpreted, as Pratt and Turonovic (2016) argued. Within the lifestyle framework, both risk and victimization are conceived in a *probabilistic* way. As far as someone (person or household) carry out behaviours or activities which expose to him to risky places, situations and/or people, his likelihood of being victimized could be increased (Hindelang et al., 1978). Cohen and Felson (1979)’s approach, instead, assumes that the convergence of offenders and targets, in the absence of capable guardians, are not attributable to any ‘risky’ activities on the part of the victims, but rather they are related to the random dispersion of daily activities carried out away from home.

Actually, Cohen and Felson (1979)’s theory defined routine activities as ‘any recurrent and prevalent activities that provide for basic population and individual needs’ (cited by Meier & Miethe, 1993: 471), namely ‘everyday life’ activities’ (Felson and Boba 2010). Thus, as the definition of ‘routine activities’ considers a wide variety of activities, from compulsory tasks linked to study or work activities to activities associated with leisure time, the theory did not support the idea of either specific risky activities as probable predictors or associated factors of crime victimization, as Pratt and Turonovic (2016) pointed out. Consequently, most of the research based on the routine activities theory examined variables such as: household composition; the degree of participation by household members in working activities and types of job; the ratio between routine activities taking place inside/outside home, and protection mechanisms in someone’s home (guardianship patterns) (Pratt and Turonovic, 2016; Meier and Miethe, 1993).

The main deficit of this literature, which followed routine-activity theory, is that the measures of 'activities that have took place away from home' are not good proxies for risky behaviors, which can become a victimization event. As Pratt and Turonovic (2016: 337) argued, although 'victimization does not *require* engaging in explicitly risky behaviours, it is also true that leaving the home is, at best, a necessary but not sufficient condition for being victimized.' Therefore, to get a better approach to the factors that can influence victimization events is crucial to measure the *differential risks* associated with diverse activities developed outside home (Turonovic and Pratt, 2014). The theory does not offer any guidance as to which activity may be more or less important regarding the occurrence of crime victimization (Pratt and Turonovic, 2016). In sum, the lack of application of the concept of 'risk' is one of the main weakness of the 'routine-activity' theory, and so, the key theoretical difference with the 'lifestyle' approach.

Following Pratt and Turonovic (2016: 339), 'a conception of risk is rooted in the assumption that not all activities in either public or private settings harbour an equal probability of victimization.' But the mere fact of taking part in risky behaviours cannot be assumed a direct cause of victimization, instead, the analysis always should be done in probabilistic terms (Pratt and Turonovic, 2016).

In order to improve the approach to the crime victimization phenomenon from a probabilistic view, Pratt and Turonovic (2016) raised two relevant suggestions. **Firstly,** researchers should offer a detailed theoretical explanation of the key intervening processes that link certain routines with victimization. The same advice can apply to other personal and family characteristics, which are not necessarily, or at least not directly, related to routine activities. **Secondly**, based on a probabilistic conception of victimization, it is necessary to highlight that the three key elements of previous theories (motivated offenders, attractive targets and capable guardians) are not randomly distributed in time and space. As Pratt and Turonovic (2016) argued, people tend to self-select into the kinds of risky behavioural activities (e.g. drinking to excess in public places) that convert them in *attractive targets* to be victimized, and those behaviours are more often in areas characterized by disadvantaged structural conditions, and, where also there are greater levels of *motivated criminals*.

For instance, Gottfredson in 1984 (Cited by Fattah, 2014: 9), analysing 1982 BCS data, found a strong association between offenders and victimization: people who reported having committed a violent crime were seven times more likely to be a direct victim of a crime, compared to people who reported not having committed crimes at all. As Fattah (2014) argued, the frequency with which some individuals engage in violence-prone situations affects their possibilities to use violence as well as their possibilities of being the recipient of violence.

On the other hand, concerning the presence of *a capable guardianship*, Mier and Miethe (1993) argued that a person or family who have limited economic resources have low possibilities to move out of high-crime neighbourhoods and live in places with greater private security systems, or to use safer modes of transportation (private rather than public). In the same sense, Pratt and Turonovic (2016) stated that a capable guardianship is less likely to be found in areas where disadvantaged conditions are concentrated: where communities' access to quality public resources is limited (e.g. formal social control) and collective efficacy or informal control is also reduced. In other words, the lack of capable guardianship is to some extent related to personal/family resources to choose the place where live or to provide themselves with security mechanisms, but also is related to public and community resources within the local context.

The fact that the motivated offenders, attractive targets and capable guardians are not randomly distributed in time and space reveals that, beyond personal and familiar characteristics, there are structural conditions linked to the ecological area - e.g. disadvantaged urban neighbourhoods- which can affect the victimization risk, and then, theories integrating micro and macro-level explanations of violence and crime are required, topic that will be addressed in the section three of this chapter.

In the following section, some of individual and household level risk-factors that emerge in the light of these theories, and which will be examined in this study, are described. Later, the hypothesis associated with those factors are presented.

III.2.2. Individual and household level factors to explain victimization risk

By integrating elements of the two theories reviewed above, some individual and household level factors to explain victimization risk were included in this study, that are described below.

Household composition and family vulnerability

Regarding the influence of household composition and/or family vulnerability in victimization the evidence is reduced and not conclusive. Studies such as Meier and Miethe (1993) and, more recently, Brookman and Robinson (2012) have demonstrated that households headed by women and where there are children or teenagers have higher risk of violent victimization.

In the light of 'Lifestyle theory', as Meier and Miethe (1993) argued, female-headed households are more vulnerable to victimization risk because female participation in the labour force compels them to leave unoccupied the home daily for long hours, and because going out to work women exposes them to risky places and risky situations. However, the study of Avakame (1999) refused such hypothesis, at least in respect of the crime of rape, the author demonstrated that unemployed women have higher risk of victimization by rape than employed women[41]. At the same time, when a mother works, and her support-network is weak, she cannot look after her children, and they become more vulnerable to any risky situation (Kamanou and Morduch, 2002).

Therefore, in households where there are child and single-parent, or where the two parents have to work, the children's exposure to risky situations is greater, particularly when the family income is not enough to provide after-school support for the child. As Brookman and Robinson (2012) argued, when children and adolescents tend to spend large periods of time in public places, without adult supervision, their risk of becoming victims of violent crimes may increase.

[41] Using data from the National Crime Victimization Survey (1992-1994), the study of Edem Avakame (1999) shows results show that unemployed women are more likely to be raped than employed women. They also show that poor, older, unmarried, white, suburban females have disproportionate risks of rape victimization.

Supporting previous statements, the international literature on social vulnerability has demonstrated that households headed by woman are more vulnerable to the effects of a natural disaster or any contingency (e.g. Adger et al., 2004; Kleinosky, Yarnal and Fisher, 2007). Those homes are particularly vulnerable when they have children because women have to balance their time between work and childcare, reducing their chances of getting a good job (Rygel, O'Sullivan and Yarnal, 2006), and because on average women received lower income than men (Kleinosky et al. 2007).

On the other hand, the fact that a school-age child is not attending the compulsory education system can be considered as a sign that something is failing in that home (Farrington, 2006). Especially if one considers the Chilean context, where the State guarantees the compulsory education from the last level of pre-school (5 years old)[42] to the last level of secondary (17-18 years old), and where there is a high coverage for these levels of education[43] (OECD, 2016). When a child ceases to attend school may be the result of the parents' negligence, may be due to a chronic family lack of resources which prevents the parents from paying mobilization or school materials, or may be due to contingent factors, such as severe health problems (e.g. Crowder and South, 2003). Whatever the cause, single or multiple, that prevents children from studying, it is clear that these children will not have the same opportunities for development as others, and they probably will be exposed to adverse situations such as having to work a young age (Svare and Lujala, 2013), or became involved in risky or illicit activities (Farrington, 2006).

As previously seen, according the lifestyle theory and recent studies, children and adolescents who are more exposed to risky places and situations (e.g. living along, go out drinking at night), have a great risk of become victim of a violent crime (Pratt and Turonovic, 2016; Brookman and Robinson, 2012). Adolescents who have frequent contact with peer-offenders would also increase their victimization risk (e.g. Schreck and Fisher, 2004; Bender and Losel 1997).

[42] In 2013 the Law 20,710 was launched, this is a constitutional reform that stablishes the compulsory of the last level of pre-school education and creates a public financing system for it (see: http://bcn.cl/1uw6k).

[43] In Chile, the coverage at primary school level is 97% (population aged 5 to 14) and at secondary school level is 80% (population aged 15 to 19), based on OECD last report (2016).

For those reasons, estimating the influence of the variables: female headship, the presence of children (under 18 years old) at home and the presence of children outside the compulsory school system, in the risk of violent and property victimization is very relevant in this study.

Social class or socioeconomic status (SES)

In relation to the variable Social Class, international literature has demonstrated a strong correlation between low social class, income inequality and many types of violence, but particularly with homicide (Meier and Miethe, 1993; Lauristen, 2001; Brookman and Robinson, 2012). Since the routine-activity theory, the negative associations between family income and violent crimes has been explained based on the proximity to potential offenders as well as the limited capacity of guardianship present in the family home (Smith and Jarjoaura, 1989).

On the other hand, the influence of the variable of 'employment status' in the risk of victimization has often been tested in terms of the level and nature of non-household activity, consistent with lifestyle and routine-activity theories (Meier and Miethe, 1993). In other words, people who work long hours outside home would be more likely to be victimized than people who stay at home, and at the same time, as their dwellings are unoccupied for long hours during day, they are also in a higher risk than dwelling where people remain long time at home. However, according the same authors, only some studies have demonstrated that non-household activities are associated with higher risk of victimization, but not in others. In similar way, Pratt and Turonovic (2016) have criticized the use of the measure 'activities that have took place away from home', as proxy of risky behaviours because spending long time outside home is, at best, a necessary but not sufficient condition for being victimized, and in fact, there are crimes that more frequently occur inside home, such as domestic violence (Brookman and Robinson, 2012).

Based on social vulnerability literature, is possible to argued that in households where the head have a low educational level the exposition to hazard is greater, while the capacity to recover after economic crisis or natural disasters are lower than in households were the head is well educated (Wood, Burton and Cutter, 2010; Fekete, 2009). A person

who have a low level of education, probably have limited cultural and economic resources, which restricts their ability to make decisions and function actively in their social environment (Adger et al., 2004). As consequence, the individual may have few opportunities for getting a good job and contribute to the family social mobility (Busso, 2001). Families with those features are usually classified as part of a low socioeconomic status (SES), and according victimization studies they are more likely to suffer from violent crimes (Smith and Jarjoura, 1989; Gaviria and Pagés, 2002; Olavarría, 2006; Brookman and Robinson 2012).

In a similar sense, the employment status and the working position of the household head is crucial for the family sustainability, particularly when the household-head is the single source of income or is the main source of income. In such context, when the household-head is unemployed, the whole household become more vulnerable to any contingency or risky situation (Schmidtlein, Deutsch, Piegorsch and Cutter, 2008). In households where the level of income is unestable and low, in overal, the capacity to prevent and to deal with risky or adverse situations are lower than high-income household (Clark et al, 1998; Wu, Yarnal and Fisher, 2002). Thus, in households where the income level is low or where the head is uneployed the likelihood of victimization should be higher than in the oposite context, however the evidence is not conclusive regarding this variable (Meier and Miethe, 1993; Brookman and Robinson, 2012; Pratt and Turonovic, 2016).

In this study, to represent the *household socioeconomic status* the variables ‘educational level of the household-head’, ‘employment status and working position of the household-head’, ‘family income level’ and ‘income dependency’ were examined.

Residential stability and quality of dwelling

From routine-activity theory, as well as from the social disorganization theory, residential stability has been emphasized as another factor that can influence crime victimization. This variable has often been measured through 'time that family have lived in the same neighbourhood' and 'housing ownership'. As Smith and Jarjoura (1989) found, families living in a neighbourhood by a short time (three years or less) have higher rates of victimization because they are not capable to develop strong ‘guardianship’ by their own or with the help of their neighbours.

Based on 1980-1985 data of the National Crime Survey (USA), Xie and McDowal (2008) concluded that residential instability increases the risk of household victimization (burglary) in two different ways. Firstly, the newcomer to the house is at more risk of victimization than the former resident, because they have lower security systems to protect home and have not yet formed relationships with neighbours. So, households with shorter time living in the same area expressed higher risk of burglary than the rest of households in the same neighbourhood. Secondly, neighbourhoods which have higher residential instability show, at the same time, higher risk of victimization. In sum, as Xie & McDowall (2008: 565) pointed out, mobility plays an important role in victimization, because the 'problems created by housing turnover are aggravated by a vicious circle of crime and residential instability'.

The physical characteristics of dwellings, as well as the legality of the property and its location - in peripheral or high-risk areas - are elements that may produce or exacerbate the social vulnerability of the families living there (Svare and Lujala, 2013). Thus, with regard to ownership, it is possible to argue that houses whose ownership is not correctly legalized can have legal problems or have less capacity of recovering after a natural disaster, since they are not entitled to receive state aid. (Cutter, Boruff and Shirley, 2003). Likewise, the lack of space or an overcrowding condition in the house, expressed in terms of availability of sleeping rooms, tends to aggravate the vulnerability of households in at least two ways. First, as Svare and Lujala (2013) argued, this condition may increase the number of potential victims in the face of a single catastrophic event (e.g. fire, burglary). Secondly, according Cutter et al (2000) and Jiménez (2013), this condition may increase stress, which in turn may promote domestic violence and even the adolescent's incursion into risky (e.g. substance abuse) or illicit activities (e.g. law offending).

Based on those arguments and in order to measure the association between family residential stability, the quality of dwelling and the risk of victimization, the variables tested in this study were: 'time in which the family has resided in the same neighbourhood, 'whether the ownership of the dwelling is irregular or regular (legal)' and 'the presence of housing overcrowding'.

III.2.3. Summary and hypothesis

Undoubtedly, the two previously described theories have made significant contributions in the understanding of victimization by diverse types of crime, especially when they have been treated in a complementary way. Both theories share the idea that a victimization experience is more likely to occur when there is a convergence of a motivated offender, an attractive target and the absence of capable guardianship, in the same time and space. Therefore, different types of people's profile may have diverse risk of become a victim depending on their ascribed characteristics (e.g. gender, age, race) and their achieved characteristics (e.g. education, occupation, income), due to some of these characteristics are associated with 'lifestyle' and 'routine activities' which involved risks, and as a result, carry with them shared expectations about appropriate behaviours.

As Pratt and Turonovic (2016) suggested, the analysis about the potential causes of victimization always should be done in probabilistic terms. Thus, researchers should offer a detailed explanation of the process or mechanisms that link certain personal or family characteristics with routines activities or situational circumstances that may expose them to victimization risk. In the case of the present thesis, three group of household characteristics were considered as factors which can increase the likelihood of family members to become victims of violent or property crimes:

Regarding *household composition and family vulnerability*, the female headship and the presence of children at home have been considered as risk factors for victimization because when women going to work may increase her exposition to risky places and situations. When mother works she cannot look after her children, and then, they become more vulnerable to any risky situation. Additionally, the presence of children in home who are outside the school system has also been considered as a variable that expresses greater vulnerability of home and its members.

Concerning *family socioeconomic status* five variables were considered as factors of risk victimization in this thesis, educational level, employment status, and working position of the household head, family income level and income dependency. In households where the head have a low educational level, while exposition to hazard is great the capacity to

recover after economic crisis or natural disaster are often low. Similarly, when the household-head is the single source of income within the family, an unemployed condition put the family in a vulnerable position respect to any contingence or risky situation.

Related to *residential stability and quality of dwelling*, studies have shown than the newcomer to the house used to have more risk to being victim than the former resident, because the former resident was a 'more capable guardianship' of their family and their home. As well as, the lack of legality and the poor conditions of the property (home), particularly in peripheral and high-risk areas, are factors that may exacerbate the social vulnerability of the families living there.

Lastly, Pratt and Turonovic (2016) highlighted that, following the probabilistic view of victimization, most risk factors of victimization are not randomly distributed in time and space, some risky behaviours are often more common in areas characterized by disadvantaged conditions. Thus, beyond personal characteristics, it is necessary to acknowledge how these factors can differently affect victimization in diverse contexts. Based on this literature review, the proposed hypotheses are as follows:

Hypothesis 1: The composition of the household and the vulnerability condition that reflect (female household head, the presence of children and children-school dropouts), are associated with a higher risk of violent victimization, but not necessarily with property victimization.

Hypothesis 2: Low household socioeconomic status (SES) (measured through educational level, employment status or working position of the household head, family income and the numbers of family members who depend on the families' income sources) is associated with a higher risk of violent victimization. High SES is associated with a higher risk of property victimization.

Hypothesis 3: Low household length of residence and poor quality of family home (unstable property ownership and overcrowded dwellings) are associated are associated with a higher risk of violent victimization, but not necessarily with property victimization.

Hypothesis 4: In neighbourhoods classified as low SES (high concentration of poverty), variables of vulnerability, socioeconomic status and residential stability are associated with a higher risk of violent victimization. Instead, in neighbourhoods classified as high SES (low concentration of poverty), previous associations are not observed.

III.3. Developing a multilevel approach of crime victimization

In this section, the emergence of a specific area within criminology 'the socio-spatial criminology' is briefly presented in order to shows that at least three different theoretical perspectives can be pursued to highlight the relevance of social contexts and places in the understanding of crime. After that, some arguments have been provided to explain why the perspective chosen in this study was the neighbourhood-effects studies based on a multilevel approach of crime. Within this approach, the two major theories, Social Disorganization and Collective Efficacy theory, are discussed. Closing this section, contradictory evidence emerged from Latin-American studies is presented, which represents a challenge to the cited theories.

III.3.1. A brief reflection on socio-spatial criminology

The concept of 'Socio-spatial criminology' was proposed by Anthony Bottoms (2012) in the Oxford Handbook of Criminology. He argued that this term represents a more integral definition compared to the other two alternatives, 'environmental criminology' and 'the geography of crime'. According Bottoms (2012), both terms described the 'spatial' dimension of this criminological field, but neither fully captures the 'social' dimension in the understanding of crime.

Among criminologists who are strongly aware of the importance of places and social contexts in the emergence of crime, can be found at least two groups (Eck and Weisburd, 2000). One, those who are focused on crime events concentrated in small 'places' (i.e. a street corner or a street segment, a building, etc.). Two, those who are mainly interested in neighbourhoods and their influence on the development of offenders (Eck and Weisburd, 2000). Concurring with the prior classification, Bottoms (2012: 450) have highlighted the same two groups within 'socio-spatial criminology': i) researchers focusing on the study of criminal events, mainly adopting rational choice and routine-activity

theoretical perspective, and, ii) researchers studying the social structures and social dynamics of neighbourhood, with a particular interest in the effects of neighbourhood on the emergence and development of criminality.

As Bottoms (2012) asserted, the study of the spatial distribution of criminality historically began in the Chicago School of Sociology, between the decade of 20s and 40s. The pioneering work of the Chicago school started by mapping the offender residences, particularly for young offenders, and, the main result was that the offender residence was patterned (Bottoms and Whiles, 1996). Highest offender rates were located in the inner-city, where a large immigrant population, poverty and residential mobility were the most important features (Shaw and McKay, 1969; Park et al, 1925). In the classic work of Park and Burgess (1925), *the City,* the authors emphasised the social-structural and cultural conditions of the neighbourhoods within which juvenile delinquency was developed. More specifically, Shaw and McKay (1942) noted that, high levels of violent crimes and offender rates remained highest over time, despite the fact that people living in such neighbourhoods have changed. Thus, the Chicago researchers pointed out that disadvantaged social conditions contribute to generate delinquency among adolescents living there, in a process which today have been called '*the production of a neighbourhood-effect'* (Bottoms, 2012:451).

More recently, in the longitudinal Pittsburgh Youth study, Wikstrom and Loeber (2000) confirmed the prior ideas. They showed that, in the poorest neighbourhoods, contextual factors are consistently significant in explaining adolescent criminality, even after controlled for various individual risk factors (cited by Bottoms, 2012: 452).

In terms of the present work, it is interesting to note that Sampson (2006) have argued that the criminogenic 'neighbourhood effects' on an individual can be the two types: *dispositional or situational*. According Wikstrom (2006), the first type of effect is observed when structural condition of a place influence residents values and their ability to exercise self-control. Concerning the situational neighbourhood effect, as Bottoms explained (2012), studies asserted that structural conditions and community' mechanisms could make more or less likely that anyone (resident or visitor), within the neighbourhood boundaries, can commit offences, or at the contrary, can suffer a crime, but this effect

would not occur once the person leave the neighbourhood. While, the study of Wikstrom and Loebers (2000) analysed the first type of effects on young people offenses, the collective efficacy models focused in the second approach. The Collective Efficacy model and the evidence supporting it will be discussed in extent later in this theoretical chapter.

Beyond this macro approach to crime, which are mainly interested in the influence of neighbourhood-effects, the second type of studies within 'the socio spatial criminology' is the **group focusing on criminal events and their relations with 'places'** in a micro-level context (Eck and Weisburg, 2000). According Bottoms (2012), this type of study also derived from the Chicago school efforts to mapping criminal areas, but to difference with the early Chicago school, they are interested in developing a detailed study of *location of offenses*, rather than places where offenders lived. However, this type of study became widely consolidated within criminology just after the '70s (Bottoms 2012).

As Bottoms (2012) and Eck and Weisburd (2000) asserted, in the study of crime events and crime places, two theoretical perspectives have dominated the field, 'Routine activities theory' and 'the rational choice' perspective. As the main ideas and contributions of the first theory was already addressed in a previous section of this chapter, just it is worthy to remember that the RAT pointed out that the structure of people daily activities may exposed them to certain people, places or situations that can explain the occurrence of a crime, and, at the same time, a motivated offender commits crimes in response to situational conditions, such as the presence of a target victim or the absence of a capable guardianship (Cohen and Felson 1979).

Concerning the *rational choice* perspective, Bottoms (2012) argued that the authors who created this approach (Cornish and Clark) pursued at the same time a programme of research and a policy strategy which was called *'Situational Crime Prevention'* (StCP). Thus, beyond the interest for explaining the specific circumstances (e.g. environmental features) in which different crimes are committed, they were searching to propose concrete measures to reduce crimes. For instance, strategies to make goods harder to steal by increasing security devices; reducing the availability of means to commit crimes or through environmental management (Bottoms 2012).

As Eck and Weisburd (2000) described, based on those theoretical perspectives, at least five areas of research has showed consistent evidence regarding the understanding of crime: i) crime concentration about particular facilities; ii) the high concentration of crime at some addresses; iii) the preventive effects of place features; iv) the mobility of offenders; and v) the study of how offender selected targets. Relevant findings from those studies not only have highlighted the role of situational opportunity in crime prevention, but also suggested that place should be a crucial component in crime theory, as well as in crime prevention policies (Eck and Weisburd 2000: 3).

The previous advances in criminological research have been possible thanks to 'the advent of high speed computing, widespread use of computer-aided dispatch systems by police, and inexpensive computer mapping' (Eck and Weisburd 2000: 3), those technological tools allowed criminologists to deep the understanding in the role of places. Besides, the similarities and significant findings achieved by the different theoretical perspectives, motivated to these scholars to form an organization called 'Environmental crime and crime analysis', which aimed to improve the research evidence and public polices proposals (Bottoms 2012).

In terms of the present study, since the original data set did not measured concepts concerning rational choice or routine activity theory, the theoretical discussion regarding RAT and the variables selected in this context was only considered as proxies of the commonly used variables in routine activity studies. In other words, tested hypothesis in this thesis included household level variables which are proxies of some typical 'life-style' and 'routine-activity' variables, but most of them offered a socio-demographic explanation of crime (at household level), rather than an understanding about the 'specific place' where crime victimization have occurred.

Next to the two groups described above, Bottoms (2012) added a third group of 'socio-spatial' crime studies, iii) the **ethnographic and/or cultural approach** studies. The author recognized that although the three traditions are not incompatible, they were developed mostly in isolation from one another, and particularly, the third has been largely neglected during the last 20 or 30 years. In fact, the cultural dimension of socio-spatial criminology was early developed within the Chicago school, from which the

classical work of Matza and Sykes (1961), *Juvenile delinquency and subterranean values*, is an outstanding example of this ethnographic tradition.

A notable recent example of the last tradition is represented by the work of Martin Innes (2014), *Signal Crimes Perspective.* After analysing 303 in-depth interviews to residents of 18 areas in England, between the years 2002 and 2005, the author showed how social reactions to crime, disorder and control are shaped by means of interpretative processes in which not all the facts affect insecurity perceptions in the same manner, because fear perception depends on how said facts symbolise other social problems[44] (Innes 2014: 22). Besides, Innes (2014) highlighted that perception of and reaction to crime, disorder, incivility and controls, take place both at the individual and neighbourhood levels. These two levels interact with each other and they can be related to either direct or indirect experiences, that is, experiences lived by significant others or experiences known via rumours or news in the media (Innes, 2014).

Although the ideas proposed by the cultural approach of crime have made a relevant contribution in the understanding of crime concentrated in poor areas, these pieces have a limited application to this thesis because they were based on qualitative ethnographic studies and the main topics pursued were around the role of signs, perceptions and expressions of certain behaviours (e.g. disorder). This thesis, on the contrary, was based on a quantitative secondary data which include perception of people living in different types of neighbourhoods and where the concept of culture were just partly measured through a couple of questions.

On the other hand, despite the enormous contribution that micro-level victimization theories have made to the development of criminology as discipline, it is undoubtedly that victimization research based on those theories has experimented multiple problems and limitations[45], as many scholars have pointed out (e.g. Meier and Miethe, 1993; Wilcox

[44] The conceptual strategy posited by Innes (2014: 1-24) is based on the notion of 'signal events' which correspond to signals containing expressions, contents, and effects. We can distinguish 'signal crimes', 'signals of social and/or physical disorder' and 'control signals'.

[45] These problems refer to the use of inaccurate measures of key concepts, few statistical controls, but especially, the absence of macro-social and community-level variables (Meier and Miethe, 1993).

and Land, 1996; Pratt and Turonovic, 2016). As Pratt and Turonovic (2016) have asserted, victimization study exclusively focused on individual factors have led to biased conclusions, mainly because they refuse to consider that individuals are not randomly distributed in their neighbourhoods.

The opposite studies, which associate aggregated levels of offenders or victimization with characteristics of territorial units at the macro-level (neighbourhoods, cities or countries), became very popular in developed countries in the '90s (e.g. Van Dijk and Mayhew, 1992; Hemenway, Shinoda-Tagawa and Miller, 2000) and more recently in Latin-America (Tenorio, 2015, quoted by Vilalta et al 2016: 31). Those studies have also be object of strong criticisms. As Lauritsen (2001: 4) stated, 'most notably, aggregate-level analyses produce findings that cannot be generalized to everyone, while individual-level research, by failing to include measures about places, implicitly assume that the community context is not an important factor (…)'.

Therefore, the lack of complementarity between studies focused on micro-social factors, and studies focused on macro-social factors, during decades, have restricted the understanding of the victimization phenomenon and its multi-causality nature (Lauritsen, 2001; Wilcox and Land, 1996; Miethe and McDowall, 1993).

Multilevel studies have become the most common strategy to overcome the traditional debate between the micro-level and macro-level explanations of crime (Bottoms and Wiles, 1999), and the above-mentioned limitations, to a large degree thanks to the development of community-surveys and the emergence of new statistical tools on hierarchical modelling (Kubrin and Weitzer, 2003; Sampson, 2012; 1993). Thus, multilevel studies of crime allow researchers to complement the analysis of micro-level explanatory factors with the consideration of macro-social factors (e.g. Van Wilsen, Witterbrood & Dirk de Graaf, 2006; Lauritsen, 2001; Wilcox and Land, 1996; Miethe & McDowall, 1993; Smith and Jarjoura, 1989). Due to the ever-growing empirical evidence of this type the ecological theories of crime, particularly Social Disorganization Theory (SDT), have revived since the 1980. After that, ecological crime studies began to estimate neighbourhood-effects on individual outcomes considering contextual causes as well individual causes (e.g. Elliot et al, 1996; Randenbush et al, 2003).

In the following paragraphs, the two major theories concerning neighbourhoods-effects on criminal victimization, are described: Social Disorganization and Collective Efficacy. The main propositions, analytical contributions, and the main limitations of these theories, are discussed here. After that, contradictory evidence emerged from Latin-American studies is presented, which represents a challenge to the cited theories. Those findings give substance to the debate on the applicability of the foreigner theories in Latin America, in which this thesis attempts to make a major contribution.

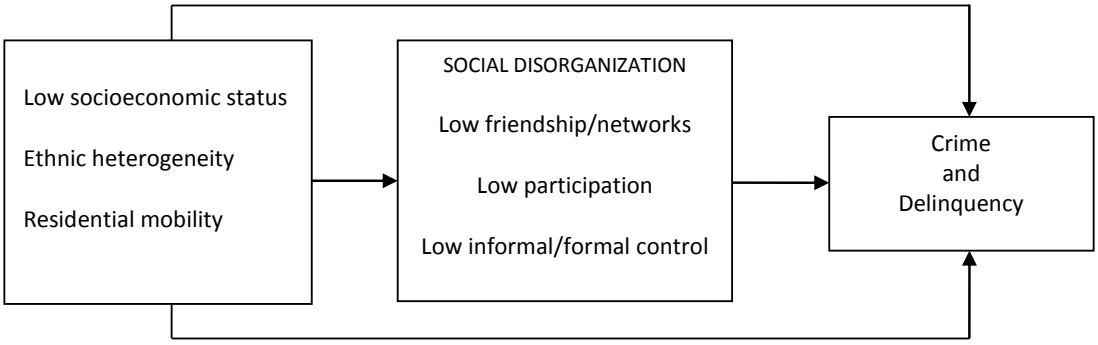
III.3.2. The Social Disorganization theory and its weaknesses

As Kazarda and Janowitz (1974) described, from a macro-social perspective the Chicago school of urban sociology developed theories attempting to explain transformation in the city population and its consequences on crime, at the beginning of the 20th century. Rooted in the assumption that social systems display structural characteristics which can be studied independent from individual attributes (Sampson, 1986), a key proposal of the Social Disorganization Theory was that, as a result of urbanization and population growth, primary relations (family, kinship ties) were substituted by secondary institutions in the exercise of social controls, which might be less effective (Park et al, 1925).

In the same sense, Shaw and McKay (1942; 1969) stated that high levels of crime persisted in inner-city neighbourhoods, despite racial and social composition change, because socializing and supervisory roles of family over adolescents' behaviour had become ineffective and because, due to the heterogeneous and unstable expectations of settlement among the newcomers, the inhabitants were not interested in developing relationships or in collaborating with neighbours to solve community problems (Shaw and McKay, 1942; 1969). So, this low ability to realize common values and exercise social controls -conceptualized as social disorganization-, was associated with higher levels of crime (Kornhauser, 1978; Bursik, 1988; Sampson and Groves, 1989).

As Sampson and Groves (1989) described, the 'Social Disorganization model' provides an explication of crime (report rates) and delinquency (offending rates), at neighbourhood level, through the effects of structural conditions and social disorganization mechanisms of the neighbourhoods – as it is observed in Figure III.1.

Figure III. 1. First formulation of Social Disorganization Model



Source: Adapted from Shaw and McKay (1942) and Sampson and Groves (1989).

Social disorganization theory had a significant impact on criminology between the 1940s and 1950s, but, due to the absence of data for measuring mediating variables, it could not be empirically tested by researchers (Sampson and Groves, 1989; Bursik, 1988)[46]. As Kornhauser (1978) said, the measurement of variables that intervene between structures and crime is crucial to adequately test theories. As a result, according to Bursik (1988), the theory became a marginal approach within criminology. Nonetheless, thanks to the systemic model of community proposed by Kazarda and Janowitz (1974), and the pioneering works of Kornhauser (1978), Bursik (1988), Sampson and Groves (1989) and Bursik and Grasmick (1993), social disorganization theory has experienced a renaissance (Rhineberger-Dunn and Carlson, 2011).

Kazarda and Janowitz defined community as 'a complex system of friendship and kinship networks, formal and informal associational ties rooted in family life and on-going socialization processes' (1974: 329). The authors also stated that neighbours' proximity and stability determine the breadth and strength of social networks, although community boundaries are often diffuse. Going even further, and revisiting the ideas of SDT, Kornahauser (1978) and Bursik and Grasmick (1993) stated that formal and informal networks, within a local community, are the infrastructure over which values, expectations for action and regulatory mechanisms are transmitted. Thereby, communities with a solid basis of friendship and associational participation should have greater potential for self-regulation across social conditions (Kornhauser, 1978; Bursik and Grasmick, 1993).

[46] More analysis about limitations of ecological research in: Bursik (1988) and Sampson (1993).

As Kubrin & Weitzer (2003) argued, the notion of '*Social Control'* is the cornerstone to social disorganization theory, which can be understood as the capacity of a social group to enforce a set of social norms through its individuals and institutions. Nonetheless, while most scholars are only focused on *Informal Control,* defined as the capacity of a community to regulate its member's behaviors according to a mutually agreed set of norms (Sampson et al., 1997), the other type of social control, *Formal Control*, which refers to the authorities' practices to maintain order and enforce legal codes (Kubrin and Weitzer 2003: 381), has been long forgotten - this topic will be discussed largely in the section 4 of this chapter.

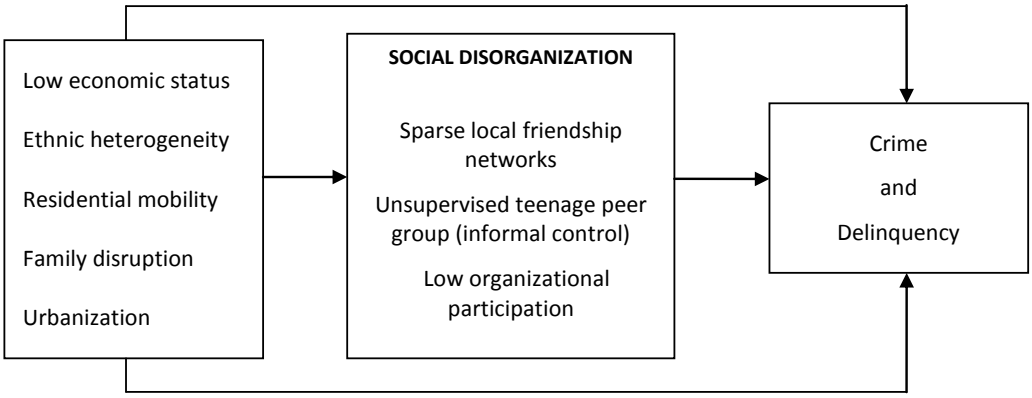
Later, in the classic work 'Community Structure and Crime', Sampson and Groves (1989) made the first empirical test of social disorganization theory, using data from the British Crime Survey (BCS-1982), which considers 238 areas in Great Britain. The authors found that sparse local friendship networks, low organizational participation and unsupervised teenage peer groups had direct effects on crime rates, and these three indicators of social disorganization mediated the relationship between structural conditions and criminal rates. Based on these findings Sampson and Groves (1989: 800) concluded: 'the overall empirical results are theoretically consistent and robust…', but also admitted that the test is not definitive because the proportion of variance explained is modest.

Thus, as Figure III.2 presents, the revised formulation of the social disorganization model provides an explication of crimes, at neighbourhood level, through the effects of structural conditions and social disorganization of the neighbourhoods, redefining the variables that measures both concept. Urbanization, low socioeconomic status, ethnic heterogeneity, residential mobility and family disruption measures 'structural conditions'. And sparse local friendship networks, low organizational participation and unsupervised teenage peer group measures the 'social disorganization' concept.

After the work of Sampson and Groves of 1989 a great body of literature has been developed examining the systemic model of social disorganization (Triplett et al, 2003; 2005; Kubrin and Weitzer 2003a; 2003b; Sampson et al, 1997; Warner and Wilcox, 1997). Most of these studies test the role of informal and formal associational ties in the promotion of informal control, as the key mechanism for preventing crime. According to

Bellair (1997) and Carr (2003), most systemic research is based on the notion that stable neighbourhoods with well-developed networks have greater potential for informal control (e.g. child supervision). Nonetheless, this assumption has been refuted by several studies which have demonstrated that the effect of social networks on crime is inconsistent (e.g. Veysey and Messner, 1999; Warner and Wilcox, 1997; Bellair, 1997; Triplett et al., 2003).

Figure III. 2. Second Formulation of Social Disorganization Model



Source: Sampson and Groves (1989: 783) revised version of Shaw and McKay's causal model of community systemic structure and rates of crime and delinquency.

Particularly, Warner and Wilcox (1997) and Veysey and Messner (1999) have developed strong arguments against the findings of Sampson and Groves's study. The authors have argued that the effect of formal and informal networks on crime was inconsistent: relationships between networks and victimization were not equally significant across different types of crime (measured through victimization and offending rates). Moreover, Veysey and Messner (1999) asserted that the variance explained was reduced and much of it was due to the effect of unsupervised peer groups -as a *proxy* of informal control-[47], which is not enough to support the SDT.

[47] Further studies recurred to other *proxies* to measure informal control, such as neighbours' ability to establish effective links with police and authorities (Bursik and Grasmick, 1993; Carr, 2003) or neighbours' willingness to intervene in community problems (Sampson et al, 1997). The last one is applied in this study.

In synthesis, SDT states that high levels of crime persist in poor neighbourhoods, where residents are mostly heterogeneous and unstable in their expectations of settlement, because supervisory roles of family over adolescents' behaviour are ineffective, and neighbours are not involved in community issues –according to Shaw and McKay's (1942, 1969) original thoughts. Revisiting this theory, Sampson and Groves (1989) have argued that socially disorganized neighbourhoods, expressed as a low ability to realize common values and exercise social controls, were more likely to suffer from high levels of crime and insecurity. On the contrary, communities with dense friendship ties and active associative capacities should have greater potential for self-regulation. Nonetheless, at the end of the '90s, ecological studies asserted that weak ties are often more effective than strong ties in the exercise of community regulatory functions and in crime reduction (e.g. Bellair, 1997), and other studies have shown that dense ties are not required to enact social controls (Sampson et al. 1997), which is the key community mechanism to prevent crimes. This topic will be addressed in the next section.

III.3.3. Collective Efficacy theory: The model and its challenges

Sampson, Raudenbush and Earls (1997) asserted that social bonds and cohesion among neighbours provide a fertile context for the realization of informal control, but it is the exercise of this control which inhibits the occurrence of crime. As Rhineberger-Dunn and Carlson (2011) said, Sampson and colleagues redefined the concept of social control through the creation of an index composed by measures of social cohesion and informal control, called *Collective Efficacy*. Although the 'Collective Efficacy' construct originally come from psychology literature[48], the largest impact in social science has come from the Sampson definition of the concept (Sampson et al, 1997: 918): 'social cohesion among neighbours combined with their willingness to intervene on behalf of the common good'.

The Collective Efficacy Model (CEM) was developed in the context of the *Project on Human Development in Chicago Neighbourhoods* (PHDCN). In this study data was collected through a community survey, police records and 1990 Census about structural conditions, social processes, crime and violence in 343 neighbourhood clusters

[48] According Hipp and Wo (2015: 169), the concept of Collective Efficacy come from the writings of Bandura (1982, 1986), who explored the empirical effect of the construct on small groups.

(Sampson, 2012; Sampson et al, 1997). The authors found that in areas of high concentration of immigrants, poverty and lower residential stability, crime victimization was higher than in other areas, but when collective efficacy was added to the model only immigrant concentration remained significant. Sampson et al (1997) concluded that collective efficacy mediates a large portion of the negative effect of neighbourhood structural conditions on violence (measured through perceptions of violence, violent victimization and homicide rates). In an extension of this model, Morenoff, Sampson and Raudenbush (2001) found that social ties and institutional resources foster the development of collective efficacy, but after controlling for collective efficacy such variables lose their influence on homicide rates. Thus, the authors conclude that neighbourhoods do not require strong formal or informal networks to obtain reductions in crime (Morenoff et al, 2001).

The Collective Efficacy Model (CEM)

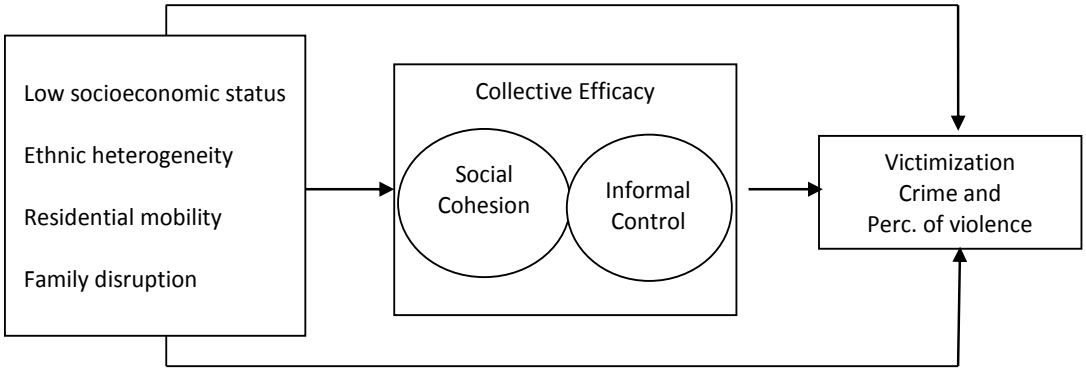
Thus, as Figure III.3 presents, the third formulation of the social disorganization model (or the collective efficacy model) provides an explication of crimes, at individual and neighbourhood level, through the effects of structural conditions and neighbourhood-collective efficacy, redefining conceptually the concept of 'social controls' through the index of 'collective efficacy'. So, the collective efficacy -shaped by social cohesion and informal control- mediates the effects of structural conditions (low socioeconomic status, ethnic heterogeneity, residential mobility, family disruption) on violent crime (measured through victimization, crime rates and perceptions of violence).

As evidence in favour of the CEM, Sampson (2012: 162-166) exposed studies conducted in Stockholm (Sweden) and Brisbane (Australia), which replicated the methodology of the Chicago study and reached similar conclusions than those disseminated in 1997.

Wikström and Sampson (2008) conducted a study in Stockholm (Sweden), designed to examine similarities and differences in how collective efficacy and the stratification of socioeconomic resources explain the crime rates in Chicago and Stockholm. Thus, the PHDCN methodology was replicated almost completely. Based on multilevel analysis of

a reduced version of 'the Community Survey' of PHDCN[49], which was applied to a random sample of 3,992 inhabitants within 200 neighbourhoods of Stockholm, census data and police data, the authors concluded (quoted by Sampson, 2012: 164): 1. "the stigmatized minority group in each city faces ecological dissimilarity with respect to socioeconomic resources, but the disparity in Chicago is much greater than in Stockholm"; and 2. "Collective efficacy is directly linked to lower violence in both cities, mediating a portion of the proposed influence of structural antecedents" (Sampson, 2012: 165-166).

Figure III. 3. Third Formulation of Social Disorganization (Collective Efficacy Model)



Source: Adapted from Vilalta et al. (2016:34) and Sampson et al. (1997)

Mazerolle, Wickes and McBroom (2010) analysed the explanatory capacity of social ties and collective efficacy, given the variations in rates of violent victimization at the neighbourhood level, using data from 2005 from police records, census data and the results of a telephone survey applied in 82 neighbourhoods in the city of Brisbane (Australia) - total sample of 2,859 cases. Through multilevel modelling, the authors found that, despite cultural and structural dissimilarities between the United States and Australia, collective efficacy is a significant factor in explaining the distribution of violent victimization in Brisbane. Indeed, as the authors (Mazerolle et al, 2010: 19) asserted, when the "measure of collective efficacy was regressed onto the reported crime data for violent offences we found that 30 percent of the variation in reported violent crime was explained by the level of collective efficacy in a community." Which was not observed in

[49] For instance, the original collective efficacy items was reduced to 4 items (2 from the cohesion scale and 2 from efficacy/control scale).

the case of social ties density, or 'the density of community-based crime prevention programs' (Mazerolle et al, 2010: 21).

For Sampson, the fact that the collective efficacy model was confirmed in cities with pronounced differences in history, political and social features, represent a strong support to assume that the CEM has reached the status of theory (Sampson, 2012: 166). In favour of this argument, recently Hipp and Wo (2015: 170) have pointed out that a great body of international literature has confirmed the negative relationship between neighborhood collective efficacy and crime. Besides the previously cited studies, Hipp and Wo (2015: 171) mentioned research from Los Angeles (USA) by Burchfield and Silver, in 2013, and another from Tianjin (China), by Zhang et al., in 2007. Despite those facts, Hipp and Wo (2015) acknowledged the weaknesses and challenges present in the definition and measurement of collective efficacy, that confront studies which have used this concept – a topic which is discussed in the next section. Based on that, the authors highlighted the need for further reflection and studies on the subject. In this sense, the present thesis represents an attempt to test the CEM in a different context (Santiago, Chile), that can contribute to this debate.

The challenges of the Collective Efficacy Model

After the study by Sampson et al. (1997), a large amount of ecological research relied on the definition of social control as *collective efficacy*, without questioning its validity, in developed countries (e.g. Mazerolle et al., 2010; Browning et al., 2004; Morenoff et al., 2001), and in developing countries (e.g. Vilalta et al 2016; Silva, 2014; Villarreal and Silva, 2006). However, several criticisms have emerged regarding the conceptualization of Collective Efficacy and its relation with crime, based on Hipp and Wo (2015) and Rhineberger-Dunn and Carlson (2011), at least two types of criticism can be identified: 1) The rigor used in the definition and measurement of the concept of collective efficacy, and, as a result, whether the notions of trust, cohesion and informal control are components of collective efficacy, or rather they are determinants of it, has not been consistent; and 2) The extent of the negative relationship between collective efficacy (cohesion and informal control), and neighbourhood crime victimization, across different contexts, has not been entirely clear.

Relative to the **first criticism**, it is inaccurate to claim that social cohesion and informal control respond to the same latent variable. The strength of social ties necessary to develop informal control is conceptually different to the exercise of these controls (Kubrin and Weitzer, 2003a; Triplett et al, 2005). In fact, in studies applied in different contexts and using different analytical aproaches, Rhineberger-Dunn and Carlson (2009), Renauer (2007) and Warner (2007) demonstrated that collective efficacy is a multi-dimensional concept, such that social cohesion and informal control are associated but they are not a part of a single construct.

In connexion with the **second criticism**, Mellado (2016: 33) has argued that the evidence regarding the effects of collective efficacy on victimization, crime rates, and perceived violence is ambiguous. This raises questions about the generalisability of the model proposed by Sampson et al (1997). For instance, case studies carried out in London (Sutherland, 2013) and in The Hage (Bruinsma, 2013), have exposed evidence against the negative relationship between collective efficacy and crime.

Similary, Hipp and Wo (2015) asserted that while a large number of cross-sectional studies had confirmed the negative relationship between collective efficacy and crime, some studies found countervailing evidence regarding the effects of collective efficacy on outcomes related to risk behaviours and juvenile delinquency (e.g. Zimmerman, 2010, quoted by Hipp and Wo, 2015: 171). In fact, Sampson in 2005 recognized that “collective efficacy may operate as a situational factor impacting crime events and not as a factor creating offenders” (quoted by Hipp and Wo, 2015: 171). Based on that, the authors concluded that the collective efficacy model may be more appropriately considered a situational theory of crime victimization than a theory of crime offending.

On the other hand, there is evidence to suggest that networks, social cohesion, formal and informal control differentially mediate the effects of neighbourhood structural conditions on victimization (Warner and Wilcox, 1997; Rhineberger-Dunn and Carlson, 2009; 2011). Thereby, Rhineberger-Dunn and Carlson (2011) showed that while informal control had a stronger impact than formal control on violent victimization, in the case of property victimization this effect was less important.

Finally, we can add that the application of the collective efficacy model in Latin America has generated contradictory results, which call into question its applicability in that region. In this regard, Sampson (2012: 167) has recognized that Latin America could be an exception in the applicability of the collective efficacy model - a topic will be developed in the next section. As discussed earlier, the debate on the applicability of the Collective Efficiency Model in Latin America is central to this thesis.

III.3.4. Evidence from Latin-America: A challenge to SDT and CEM

Although a great body of literature from the U.S. and other developed countries has supported the idea that strong informal networks are not enough to produce effective communities in reducing crime, the persistence of high levels of crime in poor and highly cohesive neighbourhoods of Latin America still constitutes a challenge for ecological theories of crime (Villarreal and Silva, 2006; Manzano, 2009). In Latin American and Chilean poor neighbourhoods where, social ties have been historically strong and structural conditions having improved at the last decades, crime had increased in the same period (e.g. McIlwaine and Moser, 2001; Arias, 2006; Lunecke and Ruiz, 2007; Lunecke, 2012). Then, why does crime persist and increase in stable and well-organized communities?

The Chilean context has particular features to emphasize. Attracted by the industrial development, in the second half of the 20th century, a great number of people from rural areas settled along peripheral areas of metropolitan cities (mainly Santiago city). Because the survival of informal urban settlements depended on the organizational strength of its inhabitants, solidarity and participation were historically outstanding in those places (Villarreal and Silva, 2006; Lunecke and Ruiz, 2007; Manzano, 2009). Although over time basic services were developed and informal dwellings were replaced by better ones, until today most of those neighbourhoods continued to be excluded from the rewards of the economic system (Lunecke and Ruiz, 2007; Lunecke, 2012). At the same time, after decades of social policies, the dwelling deficit was almost solved by mid-2000, however the localization of large projects in peripheral areas has increased

residential segregation[50] -as Arriagada and Morales (2006) argued. The isolation of the poor has aggravated severe social problems, such as school dropout, juvenile unemployment, domestic violence, drug abuse and delinquency (Sabatini et al, 2001; Arriagada and Morales, 2006).

Moreover, the social housing policy under the dictatorship period (1973-1990) forced poor families to move from settlements located in central areas of the city to the periphery (Frühling and Sandoval, 1997; Arriagada and Morales, 2006). This eradication process and the repression exerted by the dictatorial government, alongside the increase in segregation and violence, have eroded the social fabric of these communities (Frühling and Sandoval, 1997; Lunecke and Ruiz, 2007; Lunecke, 2012), which in turn limited community capacity to prevent crime. Nonetheless, Lunecke (2012; Lunecke and Ruiz, 2007) asserted that, despite this adverse context, the common experience of exclusion and stigmatization experienced over a long period by neighbours in some 'emblematic neighbourhoods'[51] produced ties and loyalties that were difficult to break down.

As discussed in the previous chapter, comparing the process of conformation and characteristics of the impoverished Latin American neighbourhoods and American neighbourhoods – as analysed by the Chicago school of sociology, Roberts (2011: 416) pointed out that while in the United States migrants' access to housing and employment was through commercial competition, in Latin America it was through collective actions based on cooperation, such as self-construction of housing and informal employment. Thus, structural factors such as residential instability, concentration of social disadvantage and racial heterogeneity, were not necessarily associated with the emergence of social disorganization in Latin American districts and neighbourhoods, as was the case in large American cities (Roberts, 2011). However, Latin American crime

[50] Residential segregation is defined as the geographic agglomeration of families of the same social condition that is expressed in the conformation of areas socially homogeneous, and in feelings of exclusion (Arriagada and Morales, 2006: 39). In Latin America, the elites are typically concentrated in a single area of the city, but within that social diversity is notable (low segregation), instead poor people are concentrated in large areas characterized by strong social homogeneity (high segregation) (Sabatini et al, 2001: 24).

[51] Emblematic neighbourhoods refer to specific poor neighbourhoods from Santiago and other big cities (Valparaiso, Concepcion), characterized by a story of political struggle, fights for social housing and of resistance to dictatorship (Lunecke and Ruiz, 2007).

studies based on SDT have not always given sufficient attention to these contextual differences, uncritically applying North American theoretical models, which may have produced problems of validity.

Since the mid-90's, several ecological studies have sought to find socioeconomic and institutional determinants of the high levels of crime and violence existent in Latin America, comparing its distribution in different aggregated units: countries, regions, cities and local districts (e.g. Fajnzylber et al, 1998; Dammert and Lunecke, 2002; Beato and Peixoto, 2006; Arriagada and Morales, 2006; Araya and Sierra, 2002; 2009; Gutierrez et al, 2009). Nevertheless, most of these studies, relying on official data, have focused on the distribution and motivations behind offender rates[52], but they did not address the issue of victimization experiences and their concentration in some areas of the big cities. As Villarreal and Silva (2006) argued, the lack of appropriate survey data with representative samples at neighbourhood level has prevented researchers from testing social disorganization and other systemic theories in the Latin American context.

Related to that, in 2015, Tenorio reviewed a total of 163 empirical studies on delinquency in Latin America and detected that half of the studies were carried out at an ample geographical scale (e.g. country, state or region, districts) and 13% of said studies were focused on small urban areas (Vilalta, Castillo and Torres, 2016: 31). Furthermore, these authors stated that studies which seek macro-social explanations for crime have tended to show the public institutional weakness as the only cause of crime, ruling out other micro and macro factors and the interaction between them.

In 2006, for the first time, a Latin-American study tested the effect of neighbourhood structural characteristics on social cohesion and crime, based on a multilevel design and data collected from a community survey in Belo Horizonte city (Villareal and Silva, 2006). The authors found that poor neighbourhoods were highly cohesive, but contrary to the previous literature, greater cohesion was not associated with lower levels of crime.

[52] For instance, with data from the 2006 Criminal Public Defender, Gutierrez et al (2009) found that almost half of prosecutions are pursued outside the local area (*comuna)* where offenders live and most prosecuted cases come from poor urban areas. They also found that while opportunities (economic motivations) explain property crimes, they are not a relevant determinant for other types of crimes.

Instead, dense ties and cohesion were associated with a higher perceived risk of victimization. Nonetheless, as the authors used measures of informal networks (interaction and exchanges among neighbours), instead of social cohesion measures (trust, solidarity, union and shared values), they only reject traditional social disorganization theory but did not test for the collective efficacy model.

In Chile, the first attempt to test the social disorganization hypothesis used a mixed method[53] case study of two poor neighbourhoods of Santiago, developed by the University of Chile between 2007 and 2008. In this study, Manzano (2009; Manzano et al, 2009) found that in the two neighbourhoods most residents had a large number of relatives and close friends living in the same local area, and made frequent contact with them. Nevertheless, as trust among neighbours was mostly low, they were often not willing to be involved in community associations. Thus, yet neighbours who had dense ties perceived that violence in their neighbourhood was high (Manzano, 2009). In contrast, as the same study reports, residents who perceived high levels of informal control also believed that violence was infrequent (Manzano, 2009).

Recently, following the same theoretical approach and a similar methodology than Manzano (2009), Huaytalla (2017) conducted a case study[54] in two poor neighbourhoods of Lima (Peru), between 2011 and 2015, aimed at exploring the community factors that explain the levels of violence in these contexts. The author observed that in these neighbourhoods, criminal violence is above the national average and that, in turn, there is high residential instability (Huaytalla, 2017: 240). In adittion, through a correlational analysis, the author concluded that (Huaytalla, 2017: 241): There was a positive association between density of informal networks, associativity and informal control; there

[53] The study used quantitative secondary data which come from criminal official statistics (police records), Census data and other specific socioeconomic indicators provided by the Municipality. In addition, the case study carried out individual and group interviews with neighbours and authorities, and applied a questionnaire including scales about organizational and institutional mechanisms, victimization and violence perception.

[54] According to Huaytalla (2017: 267-274) the study complemented qualitative techniques (semi-structured interviews and historiographic analysis) and quantitative techniques (sociodemographic data, criminal statistics and a community-survey). The survey included scales of violence perception, informal control, social cohesion, density of social ties and associativity, based on the scales adapted by Manzano (2009).

was a negative correlation between social cohesion and criminal violence, but there was not significant correlation between the informal control and that of criminal violence. Based on that findings, it is possible to argue that the collective efficacy theory is not confirmed in Peruvian neighbourhoods.

Following the same theoretical background used by Villareal & Silva (2006), and Manzano (2009) but with better methodological tools, the first multilevel study of victimization in Chile was the 'Crime and Urban Violence project', carried out by the University of Chile between 2008 and 2012. This study attempted to test social disorganization theories and other ecological hypothesis, through the development of a specific community-survey, which adapted some of the Chicago study scales about organizational mechanisms, victimization and perception of violence, the survey was applied in 2010 in 242 Santiago micro-neighbourhoods – for more information of the study see Data chapter.

Based on the 2010 Santiago-neighbourhood data, Frühling and Gallardo (2012) observed that 'concentrated disadvantage' at neighbourhood level have a significant positive effect on victimization rate, thus concentration of poverty is associated to higher level of victimization. They also found that informal control has no influence on victimization, which refuses previous hypotheses from Social Disorganization and Collective Efficacy theories. Unfortunately, some methodological weakness observed in the construction of variables and in data analysis[55] may limit the value of such findings.

Using the same dataset from Santiago neighbourhoods, Tocornal and colleagues (2014) performed a descriptive analysis. They found that around 11% of households have been victimized by property or violent crimes within the residential area, 56% of them have

[55]Firstly, the composition of victimization variables is inaccurate (e.g. violent victimization variable added interpersonal and property crimes). Secondly, through principal component analysis, two variables were defined: 'neighbourhood disadvantages' and 'habitat'. The first factor includes a great diversity of observational variables (perceptions of disorder and crime, household income level and perceptions of law adjustment) and some of these variables were low associated with the factor. The second factor was shaped by the household income level, items from the scale of informal control and the number of years living in the neighbourhood. As the denomination and interpretation given to these factors were not clear, the association or lack of association with victimization variables is even more difficult to understand.

reported crimes to the authorities, and their report is positively associated with variables linked to community resources, such as the feelings toward neighbourhood, reciprocal exchanges between neighbours and the perception of social inclusion. Also, Tocornal et al. (2014) confirmed the findings of Frühling and Gallardo (2012) regarding that the violent victimization rate increases as the socioeconomic status of the neighbourhood decreases -measured trough the percentage of poor families. On the other hand, the study found that although social cohesion (strong ties) at neighbourhood level was associated with low victimization rates by violent crimes, this community resource seemed to have no effect on the perception of insecurity. Besides, higher level of reciprocal exchanges (weak ties) was associated with lower victimization rates by crimes against property (Tocornal et al., 2014: 100).

Olavarria and Allende (2014), using the same data set and applying factorial analysis and regression models, searched to establish the determinant factors of victimization crime in Santiago neighbourhoods[56] and micro-neighbourhoods[57]. Like Frühling and Gallardo (2012), the authors concluded that the concentration of social disadvantage was associated with the occurrence of criminal and violent events in the neighbourhoods. In addition, Olavarria and Allende (2014: 216) found that the existence of trust among neighbours was associated with low levels of violent victimization, then, they argued that this community resource acted as a mechanism for the prevention of crime.

Escobar (2012), based on social disorganization theory, sought to verify if the concentration of social disadvantages, social isolation, residential mobility and various forms of social control, explained the homicide rates of Bogotá (Colombia)[58]. The author observed that 'concentration of social disadvantages' and 'social isolation' were strongly linked to homicide rates at neighbourhood level. However, contrary to the theory, the 'residential mobility' was not significantly associated with homicide rates (Escobar, 2012:

[56] The neighbourhood unit "is a political-administrative division of the territory whose purpose is to stimulate the organization of the neighbours and allow their interests to be expressed to the municipality and other government authorities" (Olavarria and Allende, 2014: 209).

[57] The micro-neighbourhood unit, "corresponds to a territorial space comprising six adjacent blocks" (Olavarria and Allende, 2014: 209).

[58] The sources of information analysed by Escobar (2012) were: official criminal statistics from 2003 to 2005, census data for 2005 and interviews.

64). In this sense, the author reported the existence of areas of the city characterized by high levels of vulnerability and violence, along with low levels of residential mobility. Finally, Escobar (2012) concluded that the presence of informal militias was positively associated with homicide rates, while greater provision of public services was associated with lower homicide rates.

Later, Alves da Silva (2014) conducted a study in Belo Horizonte (Brazil), based on a 2002 victimization survey and Census data, and following the method developed by Sampson and Groves in 1989 and theoretical background linked to SDT and CEM. The 'census district' was the unit of analysis used as an approximation to the neighbourhood unit, identifying a total of 200 districts (Silva, 2014: 222). Silva (2014) claimed to have produced evidence for supporting the relevance of an ecological approach[59] in the study of crime victimization in Brazil. However, regarding the influence of 'local friendship network' and 'organizational participation', as predictor variables of victimization risk, the findings of the study were not conclusive (Silva, 2014: 228-229).

Vilalta et al (2016) recently conducted a 35 cities study in Latin America which, based on social disorganization theory and secondary analysis of information, sought to explain the spatial distribution of delinquency at the inter-urban[60] and intra-urban level[61]. The models

[59] The models tested by Silva (2014: 223) used as a dependent variable the levels of homicide, vehicle theft, assault, robbery and rape. As independent variables, structural variables and mediating variables were defined. The structural variables were: population density, income, family disruption, urban environment and sense of belonging to the neighbourhood. The mediating variables were: friendship network, organizational participation and risk of exposure to crime. Although the models showed adequate explanatory capacity for all kinds of crimes and in general, two of the three mediating variables showed contradictory behaviours (Silva, 2014: 228-229).

[60] The independent variables included were economic deprivation (Gini coefficient), residential instability (percent of residents who lived in other state/region five years ago), dysfunctional family structures (percent of household headed by women) and routine activities (number of alcohol stores). And the dependent variables were rate each 100,000 inhabitants of crimes against property, crimes against people or violent crimes and homicides (Vilalta et al, 2016: 39-41).

[61] The variables included were economic deprivation (index of social development and margination, percent of unemployment, average years of schooling), residential instability (percent of residents who lived in other state/region five years ago), dysfunctional family structures (percent of divorced or separated, percent of household headed by women or by single father / mother) and routine activities (percent of population aged 15 to 29, percent of population aged 6 to 14 years not attending school, number of alcohol stores). And the dependent variables were rate each 100,000 inhabitants of crimes against property, crimes against people or violent crimes and homicides (Vilalta et al, 2016: 39-41).

tested at intra-urban level correspond to Santiago (Chile), Zapopán (Mexico) and the Great Metropolitan Area of Costa Rica (GAM). The conclusions of the study (Vilalta et al., 2016: 91-96) suggest that: a) the theory of disorganization provided better explanatory models at intra-urban level than inter-urban level; b) four structural conditions were identified as explanation of the distribution of crime in the cities studied (economic deprivation, residential instability, dysfunctional family structures and alcohol consumption); and c) these factors operate with different strength and even in different directions at intra-urban level, in the different cities analysed. The study did not include variables related to collective efficacy thesis and/or informal and formal control variables (Vilalta et al., 2016).

Regarding the association between collective efficacy and perception of insecurity, the findings are ambivalent and inconclusive. Valenzuela (2012), for instance, using a multi-level analysis of the 2010 victimization survey of the city of Cuernavaca (Mexico), observed that collective efficacy (formed by cohesion and willingness to intervene) and effective-informal control are inversely correlated to perception of insecurity, then those community resources may contribute to insecurity perception (Valenzuela, 2012: 209). Whereas, Núñez, Tocornal and Henríquez (2012), thanks to the multilevel analysis of the 2010 Santiago neighbourhoods survey, established that higher levels of trust between neighbours and time of residence in the same area are associated with lower levels of perceived insecurity, but at the same time, greater willingness to act in community (or informal control) is linked to higher perceived insecurity (Núñez et al., 2012). Since the data come from a cross-sectional study, the authors conclude that informal control may have been activated in front of serious crime events (Núñez et al., 2012).

As a synthesis of the Latin American ecological studies of crime, based mainly on social disorganization theory, it is necessary to emphasize that the accumulated literature is still reduced, and even if the methodological tools of those studies have improved over time, yet in some cases severe data limitations and other methodological problems were observed. Although findings of those studies have made significant contributions to a better understanding of the distribution of crime and victimization in urban areas, they are mostly not conclusive. Hence, the main findings of those studies have been that structural conditions seem to affect the levels of crimes but in a particular way. The concentration

of economic disadvantages, such as poverty and isolation, is associated to high rates of violent crimes, high likelihood of violent victimization and perception of insecurity, but in this kind of poor neighbourhood the residential mobility is essentially low, thus, this variable is not a crucial variable to explain crime victimization.

So, while most studies have demonstrated the positive influence of community social cohesion regarding the prevention of violent victimization, and in some cases, also of property victimization, the effect of neighbours' willingness to intervene in local issues (or informal control) is less clear. Some studies have shown that informal control have no effect on violent crime -at individual or neighbourhood level-, others have demonstrated that some modes of informal control may increase the occurrence of violent crimes.

III.3.5. Summary and hypothesis

In sum, after the revitalization of Social Disorganization theory (SDT), a solid body of literature supports the idea that neighbourhoods' structural conditions (e.g. poverty, residential stability and ethnic heterogeneity) exert effects over individual and community outcomes through diverse community mechanisms or mediating channels. Diverse ecological studies, between the '80s and '90s, have demonstrated that the weakness of the informal and formal networks and the eroded ability to supervise young people, were the main channels through which neighbourhood effects were transmitted to crimes rates, victimization risk and perceived insecurity. Nonetheless, some studies found that the existence of dense ties were not required to enact social controls and to reduce crime, so they tended to invalidate the main hypothesis proposed by SDT.

As a complementary approach to that tradition, Collective Efficacy Model (CEM) has stated that trust and solidarity among neighbours can enhance their willingness to be involved in community issues, which in turn may produce effective communities to deal with violent crimes and, also, to reduce perception of violence. Between the end of '90s and the decade of 2000, most international evidence from developed countries supports the CEM, however, recent studies have challenged the validity of this theory. Particularly, findings from Latin American neighbourhoods have refused CEM, as well as SDT, then the community mechanisms to explain victimization crime in those contexts remain a challenge.

As the international literature, particularly Latin-American studies, are not conclusive in the support of SDT and CEM, mechanisms linking structural conditions to social controls and to crime prevention, are still not clear. Most ecological research relies on the assumption that informal control is guided by a common desire of living in a free-crime environment, and this consensus is a direct consequence of community solidarity and trust (e.g. Sampson et al, 1997; Morenoff et al, 2001). Nevertheless, as Warner and Wilcox (1997) argued, dense networks do not always serve to reproduce conventional values and contribute to regulatory purposes. In fact, Latin-American studies have shown that some modes of informal control are associated with high levels of violence, so a discussion in respect of the influence of formal control, and their complementarity with informal control can help to disentangle the question about mechanisms that mediate the relationship between neighbourhood structural conditions and crime victimization. Based on this literature review, the next three hypotheses emerge:

Hypothesis 5: In neighbourhoods where there is a high concentration of poor families (from working class and lower socioeconomic status) and where the average of residential stability is low, the risk of violent victimization will be increased but the risk of property victimization will not.

Hypothesis 6: In neighbourhoods where there is a high concentration of poor families and low residential stability, on average, feelings towards community, friendship ties and informal networks (social interactions and collaboration) will be weak, and as a consequence, the risk of violent victimization will be increased but the risk of property victimization will not.

Hypothesis 7: In neighbourhoods where there is a high concentration of poor families and low residential stability, on average, neighbours' trust, cohesion and informal control will be weak, and as a result, the risk of violent victimization will be increased but the risk of property victimization will not.

III.4. New approaches in ecological theories of crime

Under the aim to disentangle the mechanisms linking structural conditions to crime victimization, in this section, ecological crime studies which highlight the interplay between formal and informal social control are examined. The extent of the 'new parochialism' hypothesis across different contexts, the effect that the citizens' satisfaction with police can exert in the promotion of informal control and in reducing crime victimization, as well the application of this hypothesis in the Latin-American context, are discussed below.

III.4.1. The 'new parochialism' hypothesis: the complementary of formal and informal control

Discussing the contributions and weaknesses of Social Disorganization theory, Kubrin and Weitzer (2003) draw attention to the need of examining the role of 'Formal Control', which has been largely missing from the studies based on SDT. The authors stated that the exercise of formal control may be relevant in at least two ways: Firstly, by directly affecting the levels of crime and disorder; and, secondly, by indirectly influencing the community capacity to control residents respect for social norms, namely the *informal control* practices. In the same token, Sampson (2002) argued that in modern communities characterized by weak ties, strong and legitimated institutions are a crucial element to produce social goods, as trust, cohesion and collective efficacy.

As Carr (2003) argued, much of the research that focuses on a systemic community model and SDT are rooted in the idea of social controls exerted by three types of networks: private (family and kinship ties), parochial (friendship ties and informal associations) and public institutions (school, police, etc.) (e.g. Bursik and Grasmick, 1993; Warner and Wilcox, 1997). Thus, while the control exercised by the primary and secondary groups is called '*Informal Control*', the regulation exerted by authorities and law enforcement agencies is known as '*Formal Control'* (Bursik and Grasmick, 1993). In sum, effective social controls are exerted when private, parochial and public networks are strong and work together within a community (Carr 2003).

Nevertheless, Carr (2003) highlighted that the demand for complementarity between parochial and public controls does not necessarily imply the existence of dense networks. Actually, Granovetter (1973) found that 'weak ties' play a significant role for community organization by providing communication linkage between internal and external networks (e.g. referral system to find employment). By weak ties Granovetter (1973) means impersonal and infrequent social interactions which involve specific reciprocal exchanges. In the same sense, Bellair (1997) demonstrated that infrequent contact has the strongest effect in reducing crime. Namely, 'neighbours may be willing to engage in supervision and guardianship regardless of whether they consider themselves to be close friends' (Bellair, 1997: 697).

As an example of the interplay between formal and informal control, Velez (2001), through a quantitative study, demonstrated that although residents from poor areas often have dense ties but did not have the capacity to produce *social control* by themselves, they can bring external resources to the neighbourhood through the development of partnerships. Following the definition of '*Public social controls*', by Bursik and Grasmick (1993: 17-18), as 'the ability of neighbourhoods to solicit and secure external resources by establishing ties to local government officials and the police department'. Velez (2001) asserted that even if poor neighbours do not initiate informal control, through the development of associations with the police and authorities, a type of *'community social controls',* they can significantly contribute towards diminishing the victimization risk and perceptions of isolation and insecurity (Velez, 2001).

In a similar way, but through an ethnographic study, Carr (2003) illustrated how informal control can be developed even if private and parochial controls are initially weak. In a stable, homogenous and middle-class community, called 'Beltway', a dramatic crime event was the trigger that mobilized co-operative actions. In a context of population change and rising juvenile crime, residents decided to engage in preventive actions, such as problem solving and neighbourhood watch, mainly because the intervention was collective, secure and executed in a partnership with public control institutions. This kind of control, characterized by the mutual interplay between parochial and public spheres of

control, was defined by Carr (2003: 1252) as a 'new parochialism'. It can also be seen as a form of 'bridging social capital'[62] (Putnam, 1995).

From sociological studies that tested the influence of 'Social Capital' on crime is found more evidence to support the hypothesis that different types of parochial and public controls affect crime differently (Moore and Recker, 2016; Hawdon and Ryan, 2009; De Coster et al., 2006).

Triplett, Gainey and Sun (2003) also reflected on the role of institutions in promoting informal social control. Since a theoretical viewpoint, the authors argued that neighbourhood structural characteristics (e.g. poverty, racial/ethnic heterogeneity and mobility) were the main causes of variations in institutional strength[63], and then, 'variations in institutional strength lead to variations in social control and perceptions of institutions as legitimate' (Triplett et al, 2003: 459). In addition, Triplett et al (2003) asserted that informal networks are the way in which institutions, and particularly families, access external resources. Thus, when families have taken part of networks which provide resources, such as social capital and social support, the exercise of informal social control in neighbourhoods is facilitated (Triplett et al, 2003). Nonetheless, the authors also recognized that when informal networks are dense and composed by both law abiding and delinquents, the neighbours' capacity to exert informal control is weakened – a similar argument has been developed by Browning et al. (2004).

Public or formal control institutions are, therefore, crucial for the development of community preventive actions, and as a consequence, they contribute to the reduction of victimization and perceptions of insecurity (Reiner, 2010; Velez, 2001; Carr, 2003). As Bradford and Jackson (2010) assert, if residents perceive that the police are fair and aligned with local interests, they will be more likely to cooperate in terms of reporting crime and during the investigation process. And it can even influence decreasing crime rates (Kochel, 2012; Sun et al. 2012).

[62] To Putnam (1995), while bonding social capital is characterized by strong social ties which have scarce abilities to execute informal control, bridging social capital is characterized by weak internal social ties but strategic relations with external networks from which they can obtain information and other kind of resources.

[63] According Triplett, Gainey y Sun (2003: 459) 'institutional strength is best defined in terms of four characteristics: stability, resources, clear roles and statuses, and interconnections'.

Nevertheless, many studies across different contexts demonstrate that policing in poor areas is perceived as negligent, inefficient and unfair (Frühling, 2007; Kubrin and Weitzer, 2003b; Skogan, 1994). Sampson and Bartush (1998) demonstrated that residents from disadvantaged areas were more likely than middle class and wealthier residents to claim that police officers were not interested in local issues and responded poorly to crime victims. In the same sense, Klinger (1997) asserts that the police often perceive victimized people from shantytowns as 'deserving victims', and for that reason they respond to calls from these areas less vigorously than calls from wealthier areas.

In this line, using data from the PHCDN, Silver and Miller (2004) studied the influence of citizens' satisfaction with police as a factor that mediates between structural neighbourhood characteristics and informal social control. The authors concluded that satisfaction with police effectiveness is strongly associated with the decision to report crime and with informal control actions. Therefore, as Kubrin and Weitzer (2003b) argued if residents from poor neighbourhoods are dissatisfied with the police, any effort to establish community-police partnerships may be eroded. Also Triplett, Sun and Gainey (2005) arrived at a similar conclusion in a study carried out in Indianapolis (USA).

Taking further the discussion about citizens' satisfaction with police, Sunshine and Tyler (2003) found that people's compliance with the law and their willingness to cooperate with the police mainly depended on their assessment of police as a legitimate institution. According to the authors, police legitimacy is shaped by personal or community experiences of being treated by police fairly or under a procedural justice (Sunshine and Tyler, 2003). In the same sense, Kane (2005) argued that police legitimacy is often damaged by police misconduct (corruption, violence, administrative offenses) and over/under policing. Thus, increases in policy misconduct and over-enforcement lead to rise of violent crime in disadvantaged areas, but there is not such association in wealthier areas. Even more, Kubrin and Weitzer (2003b) argued that, the generalized perception of the absence of effective formal control promotes a climate which justified the use of 'measures of justice into their own hands' (lynching, the use of violence to call attention), that could increase violent crimes.

In synthesis, there are few studies examining different types of social control and the complementarity between informal and formal social control, and their results are inconclusive. Based on this literature it is possible to emphasize that in neighbourhoods with high concentration of disadvantages and dense social ties, but weak community resources for activating regulatory mechanisms by themselves, an effort of rapprochement pursued by the authorities and the police can produce significant effects, specially, under the aim to build partnerships in crime prevention issues. Conversely, when community satisfaction with police services at the local level is poor, to the extent that police are not perceived as a legitimate institution, the residents' willingness to report crime or to collaborate with the police may be low. The perception of a lack of formal control may even lead neighbours to prefer informal control measures close to the illegality, such as justice by own hands.

III.4.2. Evidence from Latin America and Chile

In Latin America, the complementarity between formal and informal control may be a key element to unravelling why poor neighbourhoods, with strong social ties, may have high levels of crime victimization, delinquency and perceived violence. The literature concerning this topic is reviewed in the followed paragraphs.

According to diverse authors, as UNDP (2013) stated, corruption within the police are a severe problem in Latin America and hinders the public trust in social control institutions. Low levels of confidence and legitimacy, politicization, corruption, discrimination by race, gender or ethnicity, abuse of force, among others, are still regular situations in police forces of Latin American countries (Frühling, 2009; Cruz, 2010; Bergman and Flom, 2012).

In the case of Chile, since the return to democracy (1990) and until recently, the preventive national police force, Carabineros de Chile, has been more favourably perceived than forces in neighbouring countries (Frühling, 2007; Frühling, 2009). Despite this, Frühling (2007; 2011) found that levels of police confidence differed between age and socioeconomic groups: young people, people from poor areas and those who experienced victimization expressed lower confidence. Recently, in several public

opinion studies, the citizens' confidence in Carabineros de Chile has fallen sharply[64]. This is largely explained by criticisms that the institution has received from academic centres[65] (CDH-UDP 2012) and human rights institutions (INDH, 2015) due to the abusive use of force in public demonstrations, in 'identity checks'[66] and in arrests carried out particularly in vulnerable neighbourhoods or against minority groups (e.g. indigenous people), as well as for being involved in a corruption case which included more than 70 police officers, of various ranges, and whose amount exceeds $ 34,000 - the judicial process is still open- (Ramírez and Albert, 2017). In Chile the low levels of confidence may also have severe consequences on people's willingness to report crime and to develop preventive actions, as Dammert (2014) and Frühling (2009) supported.

Recently, in a case study of two poor neighbourhoods in Lima (Peru), it was detected that in the neighbourhood where the police chose to use a community approach, residents' perceived security and confidence in police was better than in the neighbourhood where police pursued a repressive approach (Huaytalla, 2017). Among the reasons given by neighbours for relying on the police, the frequent presence of the police in the local area made a substantive difference between the two neighbourhoods (Huaytalla, 2017). In the opinion of the author, this was due to the police approaches applied in each case (Huaytalla, 2017: 199-200): 'It is possible to affirm that more positive results have been found in the neighbourhood where the approach has been preventive, sustained and conceived as a local public policy (...). Instead, in the area where the control of public order has been more drastic, the results have been reduced'.

[64] In the last edition of the National Survey of the Centre for Public Studies (CEP) (April-May 2007), there was a drop in the evaluation of the institution of 17 percentage points compared to the previous measurement (November-December 2016). In the previous years (2014 and 2015) the institution had maintained the first place, with 56%, among the public institutions that the citizens trust the most. www.cepchile.cl/cep/site/artic/20170601/asocfile/20170601155007/encuestacep_abr_may2017.pdf

[65] Centro de Derechos Humanos, Universidad Diego Portales (2012), 'Violencia Policial'. In: *Informe de Derechos Humanos 2012*. www.derechoshumanos.udp.cl/derechoshumanos/index.php/informe-ddhh-2012

[66] The figure of the "preventive identity control" was created in 2015 (Law 20.931), which expands the powers already possessed by the police to request a person for identification documents, to verify pending detention orders and to review clothing, luggage and /or vehicles, without requiring the existence of well-founded indications of a commission of an offense, disposition to commit an offense, concealment of identity or possession of useful information about an offense, as was required by the previous legislation (INDH 2015).

On the other hand, Mellado (2015), through a multi-level study of 81 neighbourhoods in the cities of Bogotá (Colombia), Lima (Perú) and Santiago (Chile), examined the role police legitimacy plays in predicting perception of informal social control. The author used data from a community victimization survey applied in 2015 by the University of Chile -with a total sample of 2,641 cases-, which in turn were based on the questionnaire of the study 'Crime and Urban Violence (2008-2012) also carried out by the same University. According to Mellado (2015: 30), study findings were not conclusive regarding the influence of 'police legitimacy' on informal social control, mainly because 'neighbourhood effects' of police legitimacy over perception of informal social control was not statistically significant. An initial direct association between police legitimacy and informal control, after the inclusion of trust and cohesion in models, became insignificant. Besides, trust and cohesion, informal networks and associational ties were strongly related to the exercise of informal social control (Mellado, 2015).

In addition, Mellado (2015: 30-31) demonstrated that legal cynicism has a positive association with informal social control, after controlling for the effect of police legitimacy, structural characteristics and individual traits. As the author interpreted, this finding suggested that in contexts where neighbours recognized the law but still often act outside of it (legal cynicism), at individual and aggregated level, high levels of perceived informal social control can be observed. With respect to this finding, one should ask whether the variables used in this study to measure informal control manage to accurately capture different modes of informal control: direct and indirect, preventive or reactive, and even whether measured control actions including the use of threats or direct violence, as mechanisms of conflict resolution.

The study by Escobar (2012) in Bogotá (Colombia) -described in section 3.3- also analysed the effects of various forms of social control. In this regard, Escobar (2012: 68-70) observed that the presence of irregular militias, as well as the presence of police and conflict resolution agencies, are associated with higher levels of homicide in these territories. According to Escobar (2012), irregular militias are associated with higher homicide rates because they operate mainly through violence, especially in the case of

drug cartels, paramilitary groups and the so-called 'cleaning groups'[67]. While police and conflict resolution agencies are associated with higher homicide rates, because the spatial distribution of both responds mainly to reactive criteria. (Escobar 2012: 68).

Related to the diverse forms of informal control, Romero, Rujano and Del Nogal (2002) have described how in Venezuela, given the inefficiency of formal control agencies (police, justice), different informal control modalities have emerged, some of which are actually criminal practices. These are: informal surveillance[68], closure of residential areas, payment of vaccine - payment to civil organizations for protection - and community security organizations, promoted by the state.

Thus, although the complementarity between formal and informal control in Latin America has been little studied and the existing findings are inconclusive, it is possible to argue that the practice of formal control (mainly from police) isolated from the community tend to be associated to residents' distrust on police. Besides, the exercise of informal control exerted without the police or local authorities support, and even taking on the role of police (e.g. justice by own hands), tend to be associated with higher levels of violence and perceived insecurity. In this way, along with the willingness to exercise informal social control, the perception of institutions - especially the police - and the type of relationship established between the authorities and the community appear as crucial variables for the study of violence and crime.

III.4.3. Ecological studies on property crime victimization

Although ecological studies of crime based on SDT or CET were mainly focused on violent crime rates and/or self-reported violent crimes, studies addressing property crime rates and property victimization have increased in recent decades (for instance, Wikes et at. 2017, Rhineberger-Dunn and Carlson 2011; Xie and Macdowall 2008; Tseloni 2006; Wilcox and Land 2000).

[67] These groups operate as agents of illegal social control by murdering individuals classified as problematic (vagabonds, prostitutes, drug addicts, criminals, activists, etc.) (Escobar, 2012: 70).
[68] Those who exercise informal surveillance are not state officials or private security companies.

Wilcox and Land (2000) examined the potential generalizability of multilevel models of criminal victimization, to determine if the argument of the city-specificity in victimization theory is correct. For it, the authors compare analysed multilevel (individual and neighbourhood level) of burglary victimization across three cities of USA (Rochester, St. Louis, and Tampa-St. Petersburg). The models compared included individual-level sociodemographic and routine-activity variables, neighbourhood-level social disorganization and concentration-of-poverty variables, and micro-macro interactions. The findings suggested that the effects of neighbourhood context are important to explain the individual-level risk of burglary victimization, and above all, that the effects of individual and neighbourhood variables have similar directions and magnitude across cities. At least, Wilcox and Land (2000) observed that the effects of individual-level features are almost constant across neighbourhoods. Then, the authors argues that "many of the main effects of individual- and neighbourhood-level variables and the interplay between the two can be generalized from city to city" (Wilcox and Land, 2000: 304).

More recently, Tseloni (2006) examined the household and area effects on the incidence of total property crimes and burglaries and thefts, through analysis of multilevel models, using data from the 2000 British Crime Survey and the 1991 UK census small area statistics. The author observed that the area characteristics effects, although statistically significant, are lower than individual household effects, what was interpreted as that property victimization is more related to households' profile and life style (Tseloni, 2006). Similarly, Xie and Macdowall (2008) studied the effects of residential turnover on household victimization, using longitudinal and multilevel data from the 1980-1985 National Crime Survey. The authors found that housing turnover increases the risk of property victimization, after controlling for differences in crime vulnerability between dwellings. Thus, changes in the neighbourhood composition and in routine-activities of households affects the risk of victimization. Both findings support the social disorganization theory and the crime opportunities theory (Xie and Macdowall 2008).

Studies cited above demonstrated that household-level effects are more relevant than contextual effects, they also suggested that neighbourhood-level variables, such as residential instability and concentration of poverty, also have a significant influence in the

risk of property victimization (i.e. Burglary). Nonetheless, those studies still offered limited evidence regarding the mediating factors through which contextual effects are transmitted to delinquency or crime victimization, in the case of property crimes. Actually, within the neighbourhood-effects literature based on SDT and/or CET the main interest has been located around violent crimes occurred in disadvantaged neighbourhoods, where offenders and victims used to share the place of living, but those studies were not concerned about property crimes which commonly occurred in more affluent areas, as Bottoms (2012) explained.

Despite that, in a recent neighbourhood-effect study, Rhineberger-Dunn and Carlson (2011) have attempted to provide a better explanation of formal and informal controls and their ability to mediate the effect of negative structural neighbourhood-conditions on crime, considering that those community factors can play a differentiate effect on violent vis-a-vis property victimization. The cited study suggested that that while informal control had a stronger impact than formal control on violent victimization, in the case of property victimization this effect was less important. As Rhineberger-Dunn and Carlson (2011) explained, people are more likely to intervene in violent crime because the act creates a direct interaction between victim and offender, and the offender is commonly an acquaintance of the victim. Instead, in property crimes offenders usually are unknown and people think that police are better equipped to deal with this type of crime. These findings suggest 'different approaches are needed for the prevention and reduction of violent crimes compared to property crimes' (Rhineberger-Dunn and Carlson 2011: 29). This conclusion highlight the relevance to test hypothesis where different types of crime victimization were compared, as was made in the present study.

More recently, the study of Wickes, Zahnow, Shaefer and Sparkes-Carroll (2017) searched to evaluate the extent to which the 'guardianship' resource explain the variation of property crime rates and victimization, in neighbourhoods of Brisbane, Australia. They followed the concept of Guardianship', originally proposed by Cohen and Felson's in 1979, but to difference of other routine activity scholars, Wickes et al. (2017) considered that guardianship are not only represented by security devices (cameras, alarm systems, others) or environmental features, for them guardianship requires *human agents*, as Reynald (2009) argued.

In this sense, the authors adopted a recent definition of guardianship as 'the presence of human element which acts to deter the would-be offender from committing a crime against an available target.' (Holis, Felson and Welsh, 2013, cited by Wickes et al. 2017: 521). Nonetheless, although guardianship is often associated with crime reduction, the presence of guardians does not necessarily mean that they are willing to engage in crime prevention actions, which make a relevant difference to the concept of social control defined by SDT, as Wickes et al. (2017) and Reynald (2009) asserted. But, similarly to social controls mechanism, literature have suggested that the strength of the relationship between guardianship and crime is moderated by neighbourhood features, such as residential instability and disadvantages (Wickes et al. 2017).

Consequently, Wickes et al (2017) pursued a multidimensional definition of guardianship and a social disorganization approach, both ideas originally proposed by Reynald (2009). Based on that, the study hypotheses argued that 'guardianship presence, guardianship expectations, and guardianship actions, measured at the neighbourhood level, would all be inversely related to property crime victimization' (Wickes et al. 2017: 536). The study found that only guardianship presence had a direct effect on property victimization. Namely, residents living in neighbourhoods where many people were absent at daytime were more likely to report victimization than in the opposite context. Besides, authors concluded that reduction-direct effects of guardianship on property crime are not generalizable across contexts and specific neighbourhood features may shape opportunities for crime and crime prevention (Wickes et al. 2017).

In sum, the literature reviewed above demonstrated that while some community resources, such as social cohesion, informal control or 'guardianship actions', mediate the impact that neighborhood structural conditions have on violent victimization, those resources did not have significant influence on property crime. By contrast, resources linked to environmental characteristics (i.e. the availability of security devices or guardianship), and others associated to formal control (i.e. police-citizen relations) have more significant effects on property crimes rather than violent crimes. Findings that will be tested to a certain extent in the hypothesis of this study.

III.4.4. Summary and hypothesis

An aim of this study is to disentangle the mechanisms linking structural conditions to crime victimization. Ecological crime studies have highlighted the role that can formal control can play in the promotion of informal control. Further some studies have hypothesised the existence of a new form of social control 'the new parochialism', which consists of an interplay between formal and informal control. The evidence supporting that hypothesis has shown that although residents from poor areas often have dense ties but not the capacity to produce *social control* by themselves, they can develop some forms of informal control trough the building of partnerships with authorities and police, bringing external resources to the neighbourhood.

By contrast, a great amount of literature about citizen's satisfaction with police and police-community relationships, have demonstrated that satisfaction with police services is strongly associated with the decision to report crime and with informal control actions. Thereby, as policing in poor areas used to be perceived as negligent, inefficient and unfair, any effort to establish community-police partnerships will be unsuccessful. This is the reality in most Latin-American countries, where problems of corruption, politicization, abuse of force and low levels of citizens' confidence, are common problems for police forces. Although in Chile, police forces have been more favourably perceived than forces in neighbouring countries, the lower levels of confidence expressed by people from poor areas and a recent great fall in public confidence, make difficult to believe in the construction of more proactive police-community relationships.

Although there is still limited evidence, internationally and in Latin-America, to support the 'new parochialism' hypothesis, the multi-causal explanation of crime victimization that provided and the valuation of the role of public institutions (authorities and police) are aspects that can make a significant contribution in the understanding of crime distribution in the Latin-American context. Moreover, these kinds of proposition leave open a great field of research that should be tackled through evidence raised in the present and in further studies of victimization in neighbourhoods.

Based on this literature review, the proposed hypotheses are as a follow:

Hypothesis 8: In neighbourhoods where there is a high concentration of poor families and low residential stability, on average, perceptions of police and perceptions of municipality will be negative and the police-community nexus will be weak, and as a consequence, the risk of violent victimization will be increased but the risk of property victimization will not.

Hypothesis 9: Even though the structural conditions of some neighbourhoods may be disadvantaged, collaboration among neighbours, strong social cohesion and informal control, and a good perception of authorities (police and municipality) can contribute to develop a new form of public control, and as a consequence, the risk of violent victimization will be reduced but not necessarily the risk of property victimization.

III.5. Conclusions

In summary, the theoretical literature identifies a variety of household factors, neighbourhood structural factors and community mechanisms through which neighbourhoods might exert an influence on victimization, by violent or property crimes. However, the international empirical evidence has provided little and inconsistent support regarding the contribution of 'new forms of parochialism' or the interplay between informal and formal control. In Latin America, the empirical evidence concerning these issues are even sparser, because only a few multilevel studies, testing ecological hypotheses of crime, have been carried out until today. These deficiencies are attributable to theoretical and methodological limitations.

First, most ecological studies have relied on the collective efficacy concept without questioning its validity. Second, few studies have attempted to test the effect of the interplay between informal control and public control on victimization, a hypothesis proposed under the new parochialism concept by Carr (2003). Third, social disorganization and other ecological theories are based on the U.S. context and they are not directly applicable to the Latin American context. Fourth, due to the lack of appropriate hierarchical data, few ecological studies of victimization and crime perceptions exist in Latin America, and these are not conclusive.

Studying the experience of victimization in Santiago neighbourhoods is particularly interesting because the city is the capital and the largest city of Chile, and it has the worst levels of socioeconomic segregation, crime victimization and insecurity perceptions of the country. This makes it very similar to some of the American cities where social disorganization theory was created, although it also exhibits a number of important differences. Thus, testing the theory in a different context from the USA and other developed countries can provide interesting insights to the ecological literature. In addition, as Santiago shares several features with others Latin American metropolitan cities, findings from this study might significantly contribute to the development of further research and public policies in these issues throughout this region.

Therefore, through the use of multilevel modelling with data from Santiago neighbourhoods, the **main aim of this thesis** is to identify organizational mechanisms -at individual and neighbourhood levels- which are associated with the likelihood of being victimised, particularly by violent crimes, within Santiago neighbourhoods, and which also mediate the effects of neighbourhood structural conditions on victimization. The identification and better understanding of the association or influence of organizational mechanisms over crime victimization will make significant contributions in the development of more effective public policies focused in these criminological phenomena.

CHAPTER IV. METHODOLOGY FRAMEWORK: DATA AND METHODS.

IV.1. Introduction: Research approach and aims

Based on the theoretical background and literature review presented in the previous chapter, the current research attempts to establish the association between household characteristics, local-community resources and the experience of violent and property victimization in Santiago neighbourhoods, particularly in neighbourhoods in which structural conditions are disadvantaged. Therefore, the main purpose of this study is to find out *to what extent neighbourhood structural conditions, community-organisational mechanisms and a new form of public control influence the experience of violent and property victimization in households of Santiago neighbourhoods*? *And, to what extent do community-organisational mechanisms and a new form of public control mediate the relationship between neighbourhoods' structural conditions and the likelihood of being a victim of crime in Santiago neighbourhoods?*

To address those questions, the research design of this study draws on a multilevel approach and secondary data analysis examining the experiences of victimization suffered by households within Santiago neighbourhoods. The cross-sectional data of this study come from a community-survey of 5,860 persons (from 15 to 90 years old) who lived in 242 selected neighbourhoods of the Santiago city, conducted in 2010. The hierarchical structure of the data (incorporating both individual and neighbourhood level measures) and the adaptation of measurements internationally validated, presents an excellent opportunity to evaluate complex hypothesis with advanced statistical tools, like the hypothesis outlined in the previous chapter.

The research involved in this thesis, therefore, can be classified as quantitative, non-experimental and relational. The quantitative approach is not only determined by the nature of the information and the method used, but also by the deductive perspective of the researcher. According to Sampieri and his colleagues (2007), based on a specific theoretical framework, the researcher approaches a specific social phenomenon,

identifies potential explanatory variables, tries to measure them, examines their relationships and seeks results. In other words, the investigator preliminarily assumes one or more hypotheses and tries to confirm or refute them through the statistical analysis of data previously collected.

The present research can also be defined as non-experimental because it uses secondary cross-sectional data and does not meet the requirements of any experimental research: identification of an experimental group and a control group, selection and assignment of subjects randomly in each group, measurements at different points in time, control of most of the intervening variables (Shadish, Cook and Campbell, 2002).

Concerning the purposes around which social research is developed, according to the typology of Straits and Singleton (2011), this research can be classified as a 'Test of theoretical associations'. Relational studies seek to identify associations between concepts, dimensions or variables. These will be associations that have previously been established within a specific theoretical framework and that can be structured around questions and hypotheses, which will be answered throughout empirical research.

Regarding the statistical tools carried out in this study, Exploratory Factor Analysis (EFA) was used with the aim of building predictor-latent variables based on observational items measured in the Santiago community survey -these will be discussed in chapter V. Descriptive analysis and logistic regression models using single level data were tested - presented in chapter VI. Finally, multilevel logistic regression models, using data at individual and neighbourhood levels, were estimated. Those hierarchical models allow evaluation of the association between residents' resources or mechanisms, at individual and neighbourhood level, and the likelihood of violent and property victimization, at household level – analysed in chapter VII.

Next, within the section 'Data set and Variables', the data set used in this study is described. Secondly, the analysis unit is theoretically and operationally defined, along with the sample design process. Thirdly, the theoretical and operational definitions of the independent and dependent variables are discussed. In the followed section, 'Methods', a brief description of the three different methods used to test the hypotheses (exploratory factor analysis, logistic regression and multilevel regression modelling) is presented.

IV.2. Data and Variables

IV.2.1. Secondary data: Santiago's community survey

The analyses carried out in this thesis are based on secondary data, namely, data produced in a previous study and not in the context of the present one. The data sets were drawn from a community survey of 5,861 persons who lived in 242 selected neighbourhoods of Santiago city, also called 'Greater Santiago city'[69]. In each neighbourhood an average of 24 persons, over 15 years old, were interviewed using a face-to-face method between August and October 2010. The survey was part of the research project 'Crime and Urban Violence' carried out by the Centre for Studies on Citizen Security (CESC), based in the University of Chile between 2008 and 2012.

Santiago's community survey was designed based on the national survey of urban safety from Chile[70], and on the community surveys from the 'Project on Human Development in Chicago Neighbourhoods' (Earls, Brooks-Gunn, Raudenbush & Sampson, 1995; Sampson et al., 1997). The questionnaire includes 5 modules: 'Description of the household and selection of respondent'; 'Characterisation of the neighbourhood'; 'Presence and satisfaction with public services'; 'Community resources'; and 'Victimization, violence and incivilities'. In total, it consists of 138 questions. The core module about 'Victimization, Violence and Incivilities' includes questions about perceived risk of being a victim of crime, fear of crime, household and personal victimization within the neighbourhood, reporting of crime, perception of social and physical disorder, and perception of violent events occurring in public places within the neighbourhood.

[69] Greater Santiago is the capital and the largest city of Chile with 6.6 million inhabitants. It is located in the Metropolitan Region of Chile (2010 Statistical Compendium, INE). http://www.ine.cl/canales/menu/publicaciones/compendio_estadistico/pdf/2010/1.2estdemograficas.pdf

[70] The questionnaire and results of the national survey of urban safety (Encuesta Nacional Urbana de Seguridad Ciudadana ENUSC: http://www.seguridadpublica.gov.cl/otrasencuestas.html)

IV.2.2.Analysis unit and sampling design

Theoretical definition and delimitation of neighbourhood

As seen in the theoretical background chapter, although there is not a single and consensual definition of neighbourhood, based on the literature review this study assumes the following:

i) The neighbourhood is the smallest physical area embedded within the city, and it is shaped by hierarchically nested communities;
ii) It is an ecological unit in which people and institutions share a physical space and get psycho-social benefits;
iii) In this ecological unit, a collective life emerges from the social relationships that exist among the residents and the sets of institutional arrangements;
iv) The neighbourhood can be a source of opportunity and constraint;
v) It is an open and modifiable space, where limits are not always clear.

Regarding the delimitation problem, as Taylor (2012) argued, there is not a single or correct approach about neighbourhood limits for research or policy purposes. However, it is evident that the spatial scale chosen to represent a neighbourhood should match the spatial scale of the issue that is being tackled. In the case of violent crime in Santiago neighbourhoods - as was analysed in the background and literature chapters - although characteristics of the broader context (the city) may influence the experience of victimization, individual and household features, as well as organisational and institutional resources available within small geographical areas, are crucial to understand and to deal with the issues. Thus, when the neighbourhood delimitation is closer to the real local boundaries residents' concerns could be more easily addressed and preventive policies executed more effectively.

Considering the Suttles' (1972) schema of 'Hierarchical-nested communities', and its adaptation by Kearns and Parkinson (2001), the micro-neighbourhoods (MNs) constructed for the multilevel study of 'Crime and Urban Violence' in Santiago city mainly respond to the 'home area' scale. The 'home area' is the smallest unit of neighbourhood,

which covers an extension between 5 and 10 minutes' walk from one's home. Thus, the multilevel study of crime in Santiago neighbourhoods defined MNs as 'a small geographical area composed of 800-1,000 inhabitants within the boundaries of a *comuna*[71]. In these areas residents have the possibility of knowing their neighbours and it is possible to walk through it in approximately 15 minutes, although some institutional resources and services can be located outside this area.' (Tocornal, Tapia & Carvajal, 2014: 87-88). However, results of the survey revealed that residents' perceptions about neighbourhood limits can range from the 'home area' to the 'locality area', as will be seen in the next section.

Sampling design

In order to build the Micro-neighbourhoods (MN) and select the cases, a multistage sampling design where all staged involved simple random selection was conducted. The multistage sampling strategy is outlined below (For a more detailed description, see Núñez, Tocornal and Henríquez, 2012):

Firstly, geographical software created clusters of 6 to 9 census blocks within the 34 *comunas* of Santiago city, respecting natural and urban landmarks. As a result, 8,206 clusters or micro-neighbourhoods (MNs) were obtained, from which 242 MNs were randomly selected (see Table IV.1). A more detailed description of the selected areas and their extension are presented in the following section. Next, 25 households were drawn from each sector, and one person was interviewed from each household, using random selection at each stage. When a household did not answer the survey, it was replaced by another, also randomly selected, until around 25 cases per neighbourhood was achieved. This number was imposed as a referential goal because it allows reliable results (Raudenbush and Sampson 1999).

[71] *Comuna* is the smallest administrative-territorial unit in Chile (district). The country is divided into 346 districts and the capital, Greater Santiago city, is divided into 34 districts or *comunas*.

The final sample consisted of 5,860 inhabitants[72] located across 242 MNs, with an average of 24 respondents per MN. The sample represents the population of each MN[73] and also from all MNs' population in Santiago city[74] with an error margin of +1.3% (Núñez et al., 2012).

Table IV. 1. Population and sample description

Descriptive indicators	Population of Micro-Neighbourhoods	Sample of Micro-Neighbourhoods
Area (km^2)	73272.3	50725.9
Population Size (mean)	740	914
% Male / % Female	M 48% / F 52%	M 47% / F 53%
Nº dwelling	199	236
Nº household	185	224
Total MN	**8,206**	**242**
Total Cases	**6.6 millions**	**5,860**

Source: CESC, University of Chile (2011)

The level of representation of each sampled area in this study is better than levels found in the neighbourhood-effects literature. For instance, in the famous study of Collective efficacy by Sampson et al. (1997: 919), a sample of 8,782 persons was collected from 343 neighbourhood-clusters (NC), where 80 of these NCs had around 50 cases, while the remaining 263 only had near 20. Each NC represents a population of 8,000 people on average. Within our Latin-American region, in a Brazilian study about social cohesion and crime, the average number of respondents was 20 from 197 neighbourhoods, and each neighbourhood contained around 915 residents (Villarroel and Silva, 2006: 1731).

[72] The original sample was of 5,861 cases but one case was deleted from the analysis due to an excess of missing information.

[73] In order to achieve neighbourhood representativeness, the survey company created a person-weight and a household-weight based on the real distribution of socioeconomic status groups, gender and age groups in the population of Santiago MNs. Weights were used in descriptive analysis, but not in multilevel modelling.

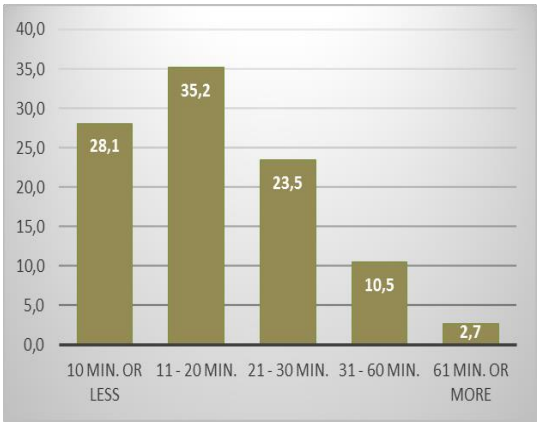
[74] Recognizing that Santiago is a particularly segregated city, it is relevant to highlight that the geographical dispersion of the MNs obtained in this study allows us to offer an accurate representation of all socioeconomic statuses existing in Santiago city (Núñez et al., 2012).

Raudenbush and Sampson (1999) revealed that beyond 20 cases per neighbourhood few improvements are achieved in the reliability of aggregated indicators.

Micro-neighbourhoods' description

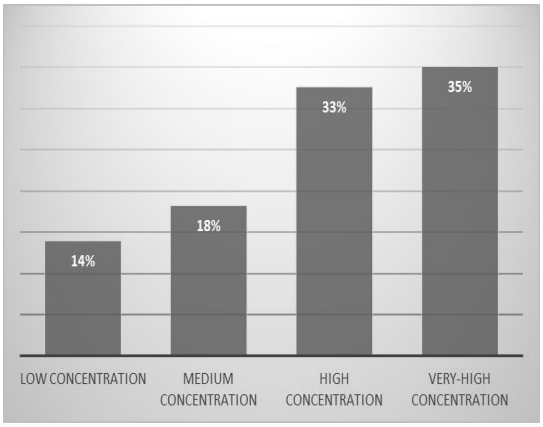
According to the survey, 28% of the population says they can walk their neighbourhood in less than 10 minutes; this added to the following group gives a total of 63% who think that the extension of their neighbourhood is less than 20 minutes' walk. In other words, the majority of interviewees shared a neighbourhood definition that moves from the idea of 'home area' to the 'locality'. The next group, of 23%, believes that the local area is extended between 20 and 30 minutes' walk, and only 13% believe it is more than 30 minutes; in both cases we would find a definition closer to the 'urban district'.

Figure IV. 1. Respondents´ perception about neighborhood extension (% of people)



N: 5,860 cases

Figure IV. 2. Classification of MNs by the level of concentration of poor residents (% of MNs)



N: 242 MNs

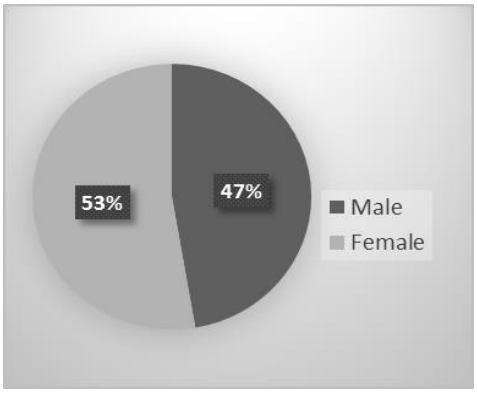
Sample description: Individuals and households

Respondents were mostly women (53%) and middle-aged people, with 50% of people under 38 years and an average age of 40 years. The most underrepresented age group was young people, 15-18 years old, who represented 7.3% of the sample, while the age group most represented in the sample was adults aged 30 to 44 years old (32.1%). Regarding educational level, most respondents had completed secondary education

(54.9%) and a significant percentage (24%) had higher education (technical or university). The minority group corresponds to people without any level of education (1.1%).

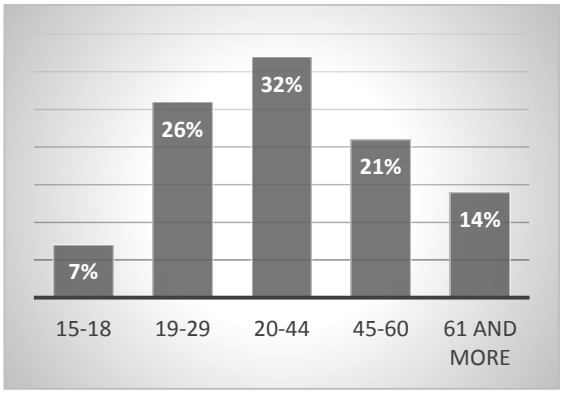
Besides, most households are composed of 2 to 4 people (62.5%), followed by a group of households composed of 5 to 8 people (26.6%), and a small group of unipersonal households (10%). More than 52% of households are composed by adults and children under the age of 18.

Figure IV. 3. Respondents´s gender (%)



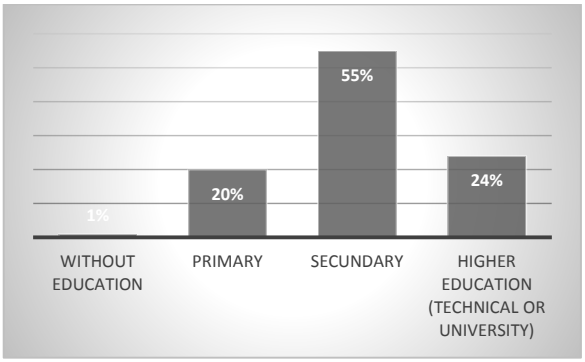
N: 5,860 cases

Figure IV. 4. Age groups of respondents (%)



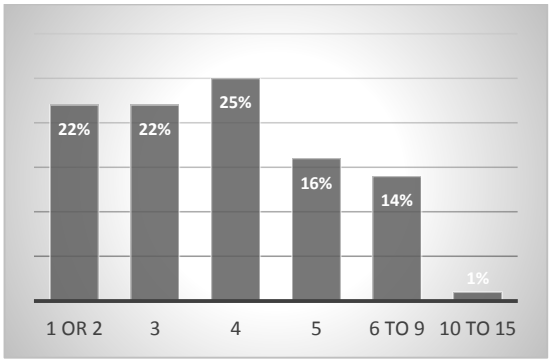
N: 5,860 cases

Figure IV. 5. Educational level of respondents (%)



N: 5,860 cases

Figure IV. 6. N° of individuals in each household (%)



N: 5,860 cases

IV.2.3.Measurements

Dependent Variables: Violent and Property Victimization

In this research two survey based variables of crime victimization[75] were used as dependent variables: 'Household violent victimization' and 'Household property victimization'. Both variables of victimization refer to the measure of 'Prevalence' (*p*), which was defined by Pease and Tseloni (2014: 30) as ´the proportion of people/places available to be victimised which are victimised'. In this case, it means the proportion of victimised households within the total households consulted in the survey, with experiences occurring in their neighbourhoods and during the past twelve months.

Household violent victimization was measured through the questions: 'During the twelve prior months, how many times have you or someone in your household been a victim of a crime where offenders used violence in any form, such as assaults, robbery, injuries, murder or sexual crimes?'; and after that, 'How many of these crimes occurred within your residential area or neighbourhood?' The last variable was converted into a binary one including a category for 'No victimised household' (0) and another for 'Victimised household' (1). As this kind of event is uncommon (see Table IV.2), most people have not suffered any violent crime; it amounts to 5.9% of victimised households[76]. Nonetheless, the distribution of this figure is high, considering areas with 0% and others with 40% of victimised households. The mean of this measure is higher among neighbourhoods with very-high concentration of poverty (see box plot IV.1). The definition and composition of the variable 'Concentration of poverty' is explained later, in the section of independent predictor variables measured at neighbourhood level.

[75] Those measures were inspired by traditional enquiries used by the International Crime Victim Survey (ICVS), and the 2009 National Survey of Citizens Safety applied in Chile (ENUSC) - see background chapter.
[76] This percentage was weighted by household-weight, so it is representative of the Santiago population.

Table IV. 2. Descriptive statistics of household victimization

Household Victimization by type of crimes (%)*			
	Violent	**Property**	Global
No victim	94.1	94.2	90.1
1	4.2	4.2	6.0
2	0.9	0.8	2.4
3	0.4	0.3	0.7
4	0.2	0.1	0.3
5	0.1	0.2	0.2
6 or more	0.1	0.1	0.4
Total victim	**5.9**	**5.8**	**10.0**
TOTAL	100	100	100
Valid cases	5798	5820	5840
Missing	62	40	21

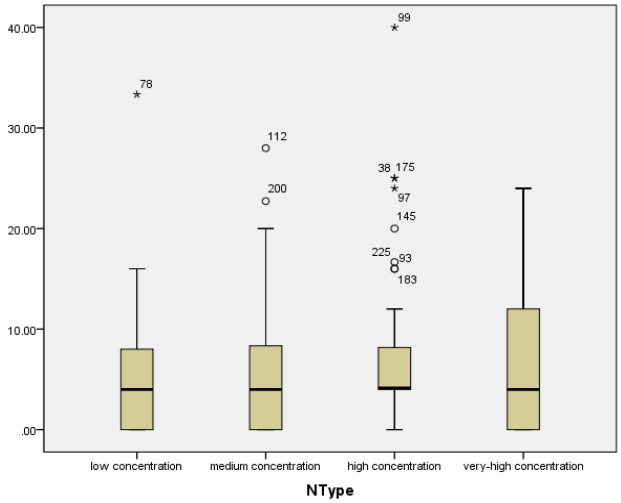
* Data weighted using household-weights
Source: CESC, University of Chile (2011)

Secondly, 'Household property victimization' was measured by the questions: 'During the twelve prior months, how many burglaries, thefts or any property crimes have the respondent, or any household member suffered, without the use of violence? (Including theft of vehicles and theft of objects inside vehicles)', and 'How many of this kind of property crime have happened within your neighbourhood?' After converting this variable into a binary one, it is found that around 5.9% of households have suffered this type of crime (see Table IV.2). The distribution of property victimization is also high, including micro-neighbourhoods with no victimised households and areas with more than 30% of victimised households. However, the differences between neighbourhoods with a low concentration of poverty and a very-high concentration of poverty is less significant (see box plot IV.2).

'Household violent victimization' and 'Household property victimization' are moderately associated - according chi-square test (sig. < 0.01) and spearman correlation (0.3) - which means that a group of households have suffered both types of crime during the past twelve months (around 1.7% of households). The addition of these two measures produces a new variable 'Household global victimization', resulting in a total of 10% of

victimised households. However, as the analysis of global victimization did not make any significant contribution to the analysis using violent and property victimization separately, this new variable was not included in subsequent analysis.

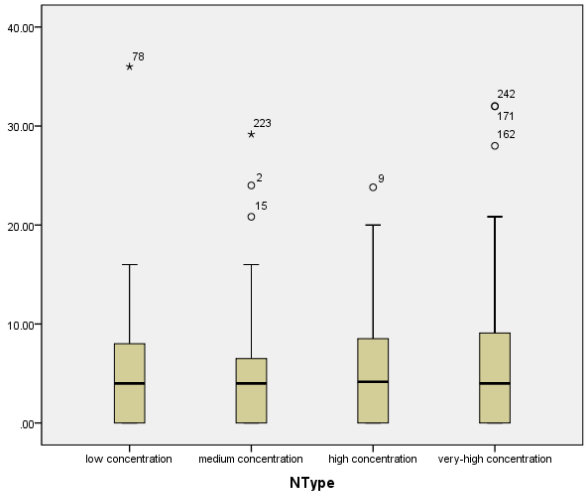
Box Plot IV. 1. Percentage of violent victimization by neighborhood type (SES predominant)



	Low	Medium	High	Very-high
Mean	4.8	5.7	6.6	6.6
Min.	0.0	0.0	0.0	0.0
Max.	33.3	28.0	40.0	24.0

Source: CESC, University of Chile (2011)

Box Plot IV. 2. Percentage of property victimization by neighborhood type (SES predominant)



	Low	Medium	High	Very-high
Mean	6.0	5.5	6.1	6.2
Min.	0.0	0.0	0.0	0.0
Max.	36.0	29.2	23.8	32.0

Source: CESC, University of Chile (2011)

Table IV. 3. Crosstab of Violent vs Property Victimization*

		Property victimization		
		No	Yes	Total
Violent victimization	No	5226	229	5455
		90.2%	4.0%	94.1%
	Yes	244	**96**	340
		4.2%	**1.7%**	5.9%
Total		5470	325	5795
		94.2%	5.8%	100%
*Chi-square test: 349.3 (sig.0.00)				

Independent control variables (household level)

The independent control variables described below were chosen in the light of the theory background discussed in Chapter III.

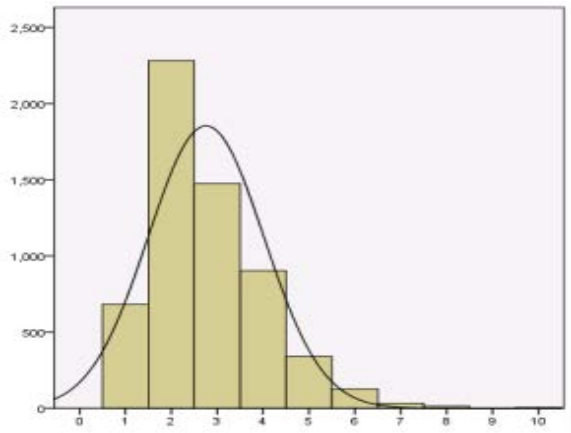
- *Household composition and family vulnerability*

Concerning the household composition, based on the number of family members and their ages two variables were constructed: the number of adults (19 years old or more) and the number of children (18 years old or less). However, as these variables were concentrated in lower values and have a no-normal distribution (see Figures IV.7 and IV.8) they were transformed in two categorical-ordinal variables: a variable of adults and another of children. As in crosstab analysis and regression modelling, the variable of 'Adults' was not significantly related to any dependent variable, this variable was eliminated and only 'Child' was used in further analysis. The ordinal variable of 'Child' was recoded into a binary one which measured the presence of children at home with the following categories: (1) the presence of one or more children (52%); and (0) the absence of children (48%); data were weighted at household level.

In addition, the variable 'Female-headed households' was measured through the question: 'What is the gender of the person who provides the main household income?' The answer was recoded into a binary variable and data were weighted at household level: (1) if the household-head is a female (30%), and (0) if that condition is not met (70%) (See Table IV.4).

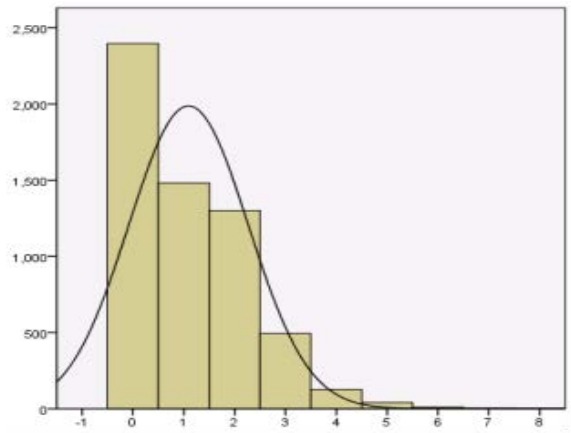
The variable 'Children at home out of the school system' was calculated from the question: 'Concerning children, how many of them attended an educational establishment last year?' The resulting variable was coded as 1/0: (1) If at least one child did not attend an educational establishment during the last year (9%), and (0) if all the children at home attended to school during the last year (91%) (See Table IV.4).

Figure IV. 7. Histogram of N Adults



Descriptive Statistics	N Adults
N Valid	5860
Mean	2.76
Mode	2
Std. Deviation	1.261
Minimum	1
Maximum	12

Figure IV. 8. Histogram of N Children



Descriptive statistics	N Children
N Valid	5860
Mean	1.09
Mode	0
Std. Deviation	1.176
Minimum	0
Maximum	9

- *Family or household socioeconomic status (SES)*

Variables commonly employed to measure 'Household socioeconomic status' are educational level of the household head, the working status of the household head and/or his/her working position, and the family income level. In the Santiago survey, all those variables were measured but as a large amount of people did not answer the question about income level (1,554 cases, 31% of the sample), that variable had to be recovered through an imputation process, resulting in a reduction of the missing cases to 58 (for more details of the imputation procedure see Appendix of this chapter).

The 'Educational level of the household head' contains the same categories than respondent educational level, but this was recoded into three categories: 1. Without education and primary level (21.7%); 2. Secondary education (54.6%); 3. Higher education (23.6%); missing cases are 98. Only the variable relative to the educational level of the household-head were used in regression models.

The variable 'Main activity of the household head' initially included six categories[77], but it was recoded and reduced the categories to four: 1. Working (67.8%); 2. Unemployed (2.8%); 3. Retired (22.5%); 4. Inactive (6.9%); there were 33 missing cases Meanwhile, the variable 'Working position of the household head' contains as categories: 1. Manager; 2. Self-employee; 3. Public officer; 4. Employee of the private sector; 5. Workers of the domestic services; 6. Relatives working without salary. As this variable only considers cases which answer 'working' in the variable 'Main activity of the household head', a new variable of 'Working position' was created, combining these two variables into a single new one. The new variable includes these categories: 1. Manager/employer (12.4%); 2. Self-employee (16.1%); 3. Employee (39.2%); 4. Unemployed (2.8%); 5. Retired or Other inactive persons (29.5%); 53 cases are missing (See Table IV.4).

The 'Household income level' was measured by the question: 'Considering all incomes in money of all household members, but not considering state contributions, approximately, in what range is the average monthly income of the household?' This question had ten responses categories[78], but in order to facilitate its inclusion in regression models it was recoded into five categories: 1. From $0 to $490 (27.5%); 2. From $492 to $784 (39.0%); 3. From $786 to $1,176 (18.0%); 4. From $1,178 to $1,960 (9.5%); and 5. More than $1,960 (6.0%). There are 58 missing cases.

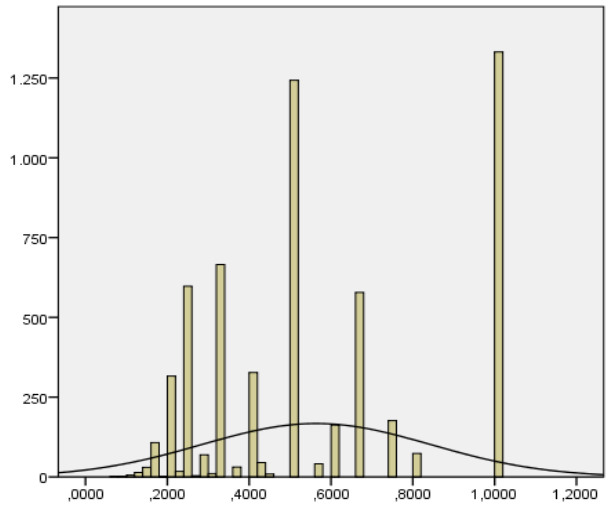
One additional variable was selected to represent 'Household Socioeconomic status': 'Income dependence'. This variable was constructed dividing the number of household members contributing incomes by the total number of household members. To avoid calculation errors, the cases that presented 0 members contributing incomes were replaced by 1 as the minimum possible value. Thus, the variable 'Income dependence' varies between 0 and 1[79]. However, as this variable was concentrated in higher values and has a no-normal distribution (see Figure IV.9), it was transformed in a categorical-

[77] The original variable 'Main occupation of the household head' included the following categories: i. Working; ii. Retired; iii. Housewife; iv. Unemployed; v. Student; vi. Incapable of work.
[78] 1. From $0 to $353; 2. Between $355 and $490; 3. Between $492 to $627; 4. Between $629 and $784; 5. Between $786 and $921; 6. Between $923 and $1,176; 7. Between $1,178 and $1,470; 8. Between $1,472 and $1,960; 9. From $1,962 to $3,332; and 10. More than $3,334.
[79] There were two cases with a value over 1 due to mistake of the respondents. The cases were assumed as 1.

ordinal variable. Its categories are: 1. High dependency - from 0.00 to 0.33 (31.4%); 2. Medium dependency -from 0.34 to 0.50 (28.2%); 3. Low dependency - from 0.51 to 0.80 (17.6%); and 4. Very low dependency - from 0.80 to 1.00 (22.7%); no cases are missing.

Other household variables associated with family socioeconomic status were examined, such as family receiving public aid, household head quoting public or private health insurance and household head quoting pension insurance, but due to their low significance in tested regression models and/or for having a high proportion of missing values, none are included in the models presented in this thesis.

Figure IV. 9. Histogram of income dependence



Descriptive Statistics	Income dep.
N Valid	5860
Mean	0.56
Mode	1
Std. Deviation	0.279
Minimum	0.07
Maximum	1

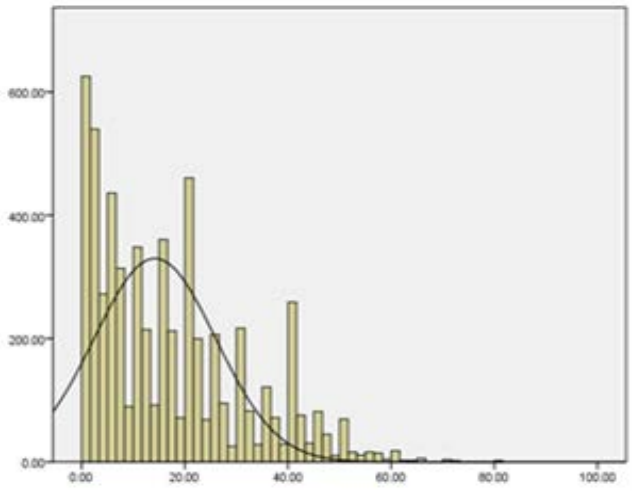
- *Household residential stability and quality of dwelling*

In the survey, the 'Family length of residence' in the local neighbourhood was measured through the question, 'How long have you lived in this house?' Although the question asked the respondent's time of residence, the correlation between personal and family time of residence is on average strong in Latin-America[80], so this variable was used as a proxy for family length of residence. The measurement scale of this variable is continuous, ranging from 0 to 80 years, more some cases outliers over 80 years.

[80] In the study 'Violence in three Latin American cities: a comparative study at the local level', using data from 81 neighbourhoods of Bogotá, Lima and Santiago, it was found that the length of residence of the survey respondent positively and strongly correlated to the family length of residence in the same neighbourhood (Pearson 0.8) - according Manzano, Mohor and Jimenez (Paper in process of publication).

Central tendency indicators show that the mean of the length of residence is 17 years, which is close to the most frequent answer, 20 years. However, dispersion measures reveal that the standard deviation is very high (14.4), which probably occurs due to a large presence of extreme cases (respondents with 0 years and over 40 years). The non-normal distribution of the cases compels to transform this continuous variable into an ordinal one. The new variable of 'Length of residence' includes four categories: 1. Low - between 0 and 5.5 years (24%); 2. Medium - between 5.6 and 19.5 years (29%); 3. High - between 20 and 35.5 years (26%); 4. Very high - 36 or more years (21%). Missing cases were not included in the analysis (12 cases) (see Table IV.4).

Figure IV. 10. Histogram of Length of Residence



Descriptive statistics- Length of residence		
N Valid		5848
N Missing		12
Median		20.000
Mode		40.0
Std. Deviation		16.4521
Minimum		.0
Maximum		81.0
Percentiles	25	7.000
	50	20.000
	75	36.000

Concerning household residential stability and the quality of family house, two additional variables were included in regression models: the ownership of the property (stable or unstable) and whether it was overcrowded. Regarding the first, the original survey question about the 'Housing ownership situation', which has seven categories[81], was recoded into a binary variable: When the dwelling is rented without contract, given free or through irregular or illegal means, the dwelling is considered unstable, assuming the value (1); on the contrary, when family lives in their own property, paying a regular

[81] The original categories are: 'Own paid'; 'Own paying'; 'Own paid with other households'; 'Own paying with other households'; 'Rented with contract'; 'Rented without contract'; 'Given for free'; 'Irregular occupation'.

mortgage or rent, the dwelling is considered stable, assuming the value (0). With data weighted at household level, 9% of households live in an unstable house and 91% do not; there are 51 missing cases (see Table IV.4). Related to the second variable, when 2.5 or more persons in the dwelling[82] use the same room to sleep the house is defined as 'overcrowded'. In this case the variable assumes the value (1); if that condition is not met the variable assumes the value (0). With data weighted at household level, 8% of households live in an overcrowded house and 92% do not; there are no missing cases.

Independent predictor variables (individual level)

The selection of independent predictor variables at individual level was made from the theoretical background, exposed in Chapter III. As most of the theoretical concepts considered as explanatory variables were measured through perception scales or by more than one question - which are defined in the followed paragraphs-, Exploratory Factor Analysis (EFA) was used to identify latent constructs underlying these observational variables (see summary table of variables in Appendix). From the selected models of the EFA, factor scores were extracted to provide variables for use in subsequent analysis. The description of the methods and procedures followed are presented in the next section, while the detailed analysis produced in the construction of variables is presented in Chapter V.

- *Social bonds: Feelings toward community, friendship ties and informal networks*

In the present study, five indicators of social bonds were tested: 'Feelings towards the neighbourhood'; 'Friendship ties'; 'Social interactions'; 'Collaboration'; and 'Formal associational networks'. However, after the EFA estimation, indicators of formal associational ties were dropped, because they did not relate to the other factors and did not make relevant contributions to tested models.

[82] According to criteria established by the Ministry of Social Development of Chile, 2015.

Feelings toward community: In the Santiago survey this variable was measured through a 5-point Likert scale with answers from 'Strongly disagree' to 'Strongly agree'. The scale included sentences such as 'Most neighbours like living here', and 'Most neighbours identify with the history of the neighbourhood'.

Local friendship: In the present study, local friendship was measured by the question: 'How many relatives and friends live in your neighbourhood?' This variable was recoded into an ordinal variable which has four categories: 1. Do not have relatives and friends in the local area; 2. Have between 1 and 2 relatives and friends; 3. Have between 3 and 6 relatives and friends; 4. Have 7 or more relatives or friends. In addition, the survey asked for the frequency of contact with these relatives and friends in the local area, with answers ranging from three or more days per week to never or rarely. In the last alternative were added persons who in the previous question answered that they do not have friends or relatives in the neighbourhood.

Informal networks: This variable was measured through scales based on international measures (Grootaert et al., 2004; Morenoff et al., 2001; Sampson et al. 1997; Kazarda and Janowitz, 1974) and adapted to the Chilean context. The resulting measures were two 5-point Likert scales with answers from 'Never' to 'Always'. The first scale measures informal interactions among neighbours with five statements, such as 'Neighbours greet each other', and 'They make friendship among them'. The second scale measures neighbours' collaboration with five statements, such as 'They share vehicles for going to work', and 'They contribute to maintain/clean streets and parks'.

An Exploratory Factor Analysis was estimated including observational variables associated with the three previous concepts, but statistical outputs revealed that a 4-factor model was the most appropriate. The factors obtained were: 'Feelings toward the neighbourhood', 'Friendship ties', 'Social interactions' and 'Collaboration among neighbours' (a more detailed description of this analysis is found in Chapter V). Those variables or factors were used in regression models at individual level and also at neighbourhood level (Chapters VI and VII).

- *Collective Efficacy: Social cohesion and informal control*

In the present study concepts of Social Cohesion and Informal Control were measured through three different scales: Trust, Union and Informal control, based on measures developed by Sampson et al. (1997).

Social cohesion: In the Santiago community survey concepts of *Trust* and *Union* were measured through two 5-point Likert scales with answers from 'Strongly disagree' to 'Strongly agree'. The scale of 'Trust' between neighbours consisted of five statements, such as, 'If someone goes out he/she knows that neighbours will watch over his/her home'; 'People of this neighbourhood are more reliable than people from other neighbourhoods'. The scale of 'Union' includes five statements, such as, 'This neighbourhood is very united'; 'There are communication and understanding between neighbours'; and 'Neighbours act with solidarity and collaboration'. On both scales two items were expressed in a negative sense, so their polarity was reversed.

Informal control: In the Santiago community survey this concept was measured through a 5-point Likert scale of 'Shared expectations for social control', with answers ranging from 'Very unlikely' to 'Very likely'. Residents were asked about the likelihood that neighbours would intervene in situations such as: when teenagers are skipping school and hanging out on a street corner; when a neighbour is walking drunk through the neighbourhood; when a fight is happening in front of your home; when a neighbour hits his child in public; when some neighbours throw out garbage on streets; when there are people consuming or selling drugs in public places; and when a stranger is attempting to steal from someone in the neighbourhood.

An EFA was computed which included observational variables associated with the previous concepts ('trust', 'union' and 'informal control'). From the analysis a 2-factor model was finally selected. The 2-factor model was selected because it offers a reasonably good fit of data and is theoretically supported. The factors obtained were: 'Social cohesion and informal control' - see the detailed analysis in chapter V.

- *Public control and the Police-community nexus*

In this study the concept of public control was measured through indicators of citizens' satisfaction with local government and police, (e.g. Velez, 2001; Silver and Miller, 2004)> In addition, some independent questions was used to measure the concept of police-community partnerships or nexus.

Public control: In the Santiago survey residents' satisfaction with police in their functions were measured through a proxy, the likelihood that the two police forces would respond to a neighbour's call and go to the place as soon as possible, with answers ranging from 'Very unlikely' to 'Very likely'. Regarding the local government, the survey includes a scale which measures residents' perceptions about the quality of different services provided by the Municipality related to conservation of public places and crime prevention in the neighbourhood, with answers ranging from 'Very bad' to 'Very good. Two items[83] not directly related to crime prevention and a high amount of missing cases were deleted.

Police-community nexus: As the Santiago community-survey did not include questions about how well the police are involved in local issues or maintain contact with the community, two questions which measured residents' knowledge about police proximity to the local community were considered as proxies: whether neighbours know how to make contact with the police officer assigned to their neighbourhood, and whether meetings between police and community have ever been carried out in their area; both questions have 'yes/no' answers.

After an EFA was estimated, a 3-factor model appeared to be the most appropriate. The factors obtained were: 'Residents' perceptions of police response', 'Residents' perceptions of municipality services', and 'Residents' knowledge about the police-community nexus'.

[83] Items deleted were: 'Measures to promote employment, training and productive development' and 'Measures to promote sport, leisure, culture and educational activities.'

Independent Predictor Variables (neighbourhood level)

- *Concentration of poverty and residential stability*

To measure structural conditions and their influence on crime, Sampson et al. (1997) tested observational variables from Census data using factor analysis. Three latent factors appeared significant in their analysis: 'Concentrated disadvantage', 'Residential stability' and 'Immigrant concentration'[84]. In this study, a similar approach was attempted with the use of 2012 Census data. However, as the 2012 Census data set was not available for research use[85] and 2002 Census data are too old to match with the 2010 survey, it was decided to dismiss the previous approach and to find an alternative option.

The survey provided five continuous variables[86] with the numbers of households belonging to each socioeconomic status (SES) per neighbourhood: high class; middle-high; middle-low; working class; and lower class. After adding the percentage of families belonging to the last two SESs (commonly called D and E socioeconomic status) in each neighbourhood, the variable of 'Concentration of poverty' was obtained to be tested as an explanatory-exogenous variable. The standardized version of this continuous variable was used in multilevel regression models, but for some descriptive analysis and single-level logistic models a categorical variable of 'Concentration of poverty' was created.

The new ordinal variable of 'Concentration of poverty' was shaped by four categories: 1) Low concentration of poverty (less than 25% of families from D-E status); 2) Medium concentration of poverty (between 25% and 39.5% of families from D-E status); 3) High concentration of poverty (between 40% and 59.4% of families from D-E status); 4) Very-high concentration of poverty (60% or more of families from D-E status).

[84] The first factor is well represented by six variables: 'Population below poverty line'; 'Unemployed population'; 'Families on public assistance'; 'Female-headed families'; 'Population under the age of 18'; and 'Black population' are variables relevant to explain the construct. The second included: 'People living in the same house for more than five years'; and 'Owner-occupied house'. The third factor was related to immigrant population, but this construct will not be included in the present study.

[85] The application of the 2012 Chilean Census contained several serious mistakes and for that reason experts suggested the resulting data was not useable (http://ciperchile.cl/2013/08/07/censo-2012-comision-de-expertos-ratifico-errores-y-recomendo-rehacerlo-el-2015/)

[86] The survey company estimated those indicators based on 2002 Census data, projections for growth of the National Institute of Statistics (NIS or INE the Spanish acronym), and other sources of information.

In addition, as a proxy of the 'Residential stability' of families within the neighbourhoods, the average or arithmetical mean of the variable 'Family length of residence' at neighbourhood level was also considered as an explanatory variable in regression models (see descriptive statistics in Table IV.4).

- *Mediating explanatory variables at the neighbourhood level*

To measure the influence of organisational or community resources (e.g. community sentiments, social cohesion), as well as the influence of institutional resources (e.g. public control and the community-police nexus) in the likelihood of crime victimization, the nine variables obtained through the EFA analysis, previously described, were aggregated at neighbourhood level. After computing the mean of each variable, the individual-level variables were centred by the mean[87]. Therefore, the explanatory-mediating variables were tested assuming two different forms or levels: 1) The Group-Centre scores of the individual level variable; and, 2) The neighbourhood mean of each variable.

[87] The reason for computing the group-centre scores and the procedures followed in this study are explained in the next section (methods).

Table IV. 4. Descriptive statistics of individual and neighbourhood level variables

Dependent variables - household level*	**Valid N**	**%**
Household violent victimisation (Yes)	5,798	5.9%
Household property victimization (Yes)	5,820	5.8%
Predictor variables - household level*	**Valid N**	**%**
Female household head (yes)	5,860	13.8%
Presence of child at home (yes)	5,860	53.2%
Child's out school (yes)	5,860	9.1%
Education level of household head	5,763	
Primary or without education		14.5%
Secondary		57.4%
Higher education		28.1%
*Main activity of the household head***	5,827	
Occupied		67.8%
Unemployed		2.8%
Retired		22.5%
Inactive (student, housewife, disabled)		6.9%
*Working position of the household head***	5,815	
Manager		12.4%
Self-employee		16.1%
Employee		39.2%
Unemployed		2.8%
Retired		22.6%
Inactive (student, housewife, disabled)		6.9%
New family income (after missing imputation)	5,802	
0 - US $490		27.5%
$491 – 784		39.0%
$785 – 1177		18.0%
$1178 – 1960		9.5%
$1961 or more		6.0%
Income dependency	5,860	
High level		31.4%
Medium level		28.2%
Low level		17.6%
Very low level		22.7%
Unstable family house (yes)	5,809	9.0%
Overcrowded family house (yes)	5,860	8.0%
Length of residence	5,852	
Low (0 - 5.5 years)		24.0%
Medium (6 - 19.5)		29.1%
High (20 - 35.5)		25.9%
Very-high (36 or more)		21.0%

*Descriptive analysis estimated weighting data at individual level or household level.
** These two variables were strongly associated, then just one of them was used in regression models.
Source: Own estimates based on Santiago community-survey 2010 (University of Chile).

Table IV. 5. Descriptive statistics of individual and neighbourhood level variables

Predictor variables - individual level**	**Valid N**	**Mean/ St. dev.**	**Minimum**	**Maximum**
Feelings toward community (gcf1)	5,860	.000 / 1.00	-3.29	2.21
Social interactions (gcf2)	5,860	.000 / 1.00	-3.17	2.06
Collaboration (gcf3)	5,860	.000 / 1.00	-2.16	2.67
Friendship ties (gcf4)	5,860	.000 / 1.00	-1.78	1.78
Social cohesion (gcf5)	5,846	.000 / 1.00	-3.49	2.94
Informal control (gcf7)	5,846	.000 / 1.00	-2.36	2.51
Perception of police (gcf8)	5,860	.000 / 1.00	-2.85	1.52
Perception of municipality (gcf9)	5,860	.000 / 1.00	-2.64	2.82
Police-community nexus (gcf10)	5,860	.000 / 1.00	-1.40	4.48
Predictor variables - Neighbourhood	**Valid N**	**Mean/ St. dev.**	**Minimum**	**Maximum**
Mean of feeling toward community (Mf1)	242	.000 / 1.00	-3.26	2.38
Mean of social interactions (Mf2)	242	.000 / 1.00	-2.88	3.27
Mean of collaboration (Mf3)	242	.000 / 1.00	-2.69	3.19
Mean of friendship ties (Mf4)	242	.000 / 1.00	-2.67	2.28
Mean of social cohesion (Mf5)	242	.000 / 1.00	-2.48	2.88
Mean of informal control (Mf7)	242	.000 / 1.00	-2.62	2.42
Mean of perception of police (Mf8)	242	.000 / 1.00	-2.50	2.15
Mean of perception of municipality (Mf9)	242	.000 / 1.00	-2.85	2.98
Mean of Police-community nexus (Mf10)	242	.000 / 1.00	-2.02	3.01
N. concentration of poverty	242	.000 / 1.00	-2.34	1.84
Mean of length of residence	242	.000 / 1.00	-3.00	3.43

*Descriptive analysis estimated weighting data at individual level or household level
** All continuous variables (factor scores) at individual level were standardised using Z Score and centred towards the group mean, in order to facilitate outputs interpretation and comparison between them.
*** All neighbourhood variables, except 'concentration of poverty', were estimated through the mean of the original continuous variables at individual level, after that, all neighbourhood-mean variables were standardised using Z Score.
Source: Own estimates based on Santiago community-survey 2010 (University of Chile).

IV.3. Methods

With the purpose of answering the research questions, three quantitative analysis strategies were developed: factorial analysis, logistic regression models, and hierarchical or multilevel regression logistic models. These three strategies or analytical tools are described in detail below, summarising the steps followed in each analytical process. In the last section of the chapter, the main contributions and methodological limitations of this study are presented.

IV.3.1. Factor analysis

As described above, most of the central theoretical concepts of the study were measured through multiple Likert scales of perception or through multiple-choice questions. For example, in order to measure the concept of 'Trust' a 5-point Likert scale was included in the survey, containing several statements regarding the reliability of neighbours and the exercise of trust-based actions. The set of items that make up each scale is what in measurement theory is known as observed variables, whereas the concepts that are behind these affirmations, in the example 'Trust', are the latent variables (Borsboom, Mellenbergh and Van Heerden, 2003).

In other words, 'latent variables' represent constructs commonly linked with theories of human behaviour (psychological, sociological, etc.), which cannot be directly observed or measured in social reality (Borsboom, Mellenbergh and Van Heerden, 2003). Therefore, in order to address such 'latent constructs' social science studies proposed 'proxies variables' or perception scales which can be directly observed through the use of questionnaires.

Factor analysis is a statistical tool oriented to identify latent constructs underlying observed variables (Bartholomew, Steele, Moustaki & Galbraith, 2008). To identify latent variables and, at the same time, reduce the dimensionality of an instrument, factor analysis estimates the differentiation and measurement of the common variance and single variance of an item set (Bartholomew et al., 2008). The particularity of Exploratory Factor Analysis (EFA), in comparison with Confirmatory Factor Analysis (CFA), is situated in the aims of each tool. While in EFA the researcher seeks latent variables

without a previous theoretical framework, in CFA the researcher evaluates the empirical fit of a theoretical model (Bartholomew et al., 2008). In the present study, the factorial analysis involved an exploratory component as well as a confirmatory component. Each of these analyses followed the procedures described in the next section.

Exploratory Factor Analysis

EFA allows identification of the structure behind a set of items, defining the number of factors to be constructed, which items shape each factor, and what the meaning of these items is for the selected factors (Bartholomew et al., 2008).

Factor models were tested using Stata and Mplus to take advantage of the two different approaches for producing factor analysis with categorical variables. To estimate Exploratory Factor Analysis (EFA) for categorical data (binary or ordinal) or for categorical and continuous data, Stata and Mplus use a polychoric correlation matrix instead of raw data. Once the polychoric matrix is obtained, Stata produces factors using by default the principal-factor method (communalities set to the squared multiple-correlation coefficients); Mplus instead uses as a default method the weighted least square mean-and-variance adjusted (WLSMV) (Geiser, 2013; Schmitt, 2011). This method relies on adjustments to the chi-square test statistic, so it can offer accurate parameter estimates and test statistics for non-normally distributed data (Schmitt, 2011). This software also has the advantage of keeping most data because it includes cases with information on at least one observed variable (Geiser, 2013).

After choosing the method of analysis to be implemented, Schmitt (2011) stated that two important decisions must be taken: i) the method or criterion to determine the number of factors; and, ii) the rotation structure of the selected model.

To determine the number of factors of the model to be selected, at least three criteria were considered. First, the Kaiser criterion (K1) was analysed, which consists of reviewing the eigenvalues of each potential model and selecting the number of factors associated with an eigenvalue equal to or greater than 1. However, as the eigenvalue-greater-than-1 rule (K1 criterion) is often an inaccurate method for choosing the number

of factors, as Schmitt (2011) argued, in most cases the factors with eigenvalues greater than 0.7 were chosen, and that decision was complemented by the scree plots review. Thus, the second criterion applied was the scree plots: this tool allows us to visualise the proportion of the variance that is explained by each factor, and to see at which point of the curve (number of factor) the variance begins to be reduced. By integrating the results obtained through Stata and Mplus the scree plots allow to make a better-informed decision regarding the number of factors to be selected.

According to Schmitt (2011), a more accurate approach for selecting the number of factors is offered by Parallel Analysis (PA)[88]. Although this method was also tested in this study, it did not offer a better or different solution than the previous approaches, and for that reason the outputs of the parallel analysis were not included in this thesis.

The third method or criteria used to select the number of factors of the EFA model was the analysis of the goodness-of-fit statistics. Besides the traditional chi-square test (X^2), which has been largely criticised[89] (Schmitt, 2011), the outputs of the EFA offered statistical indicators to evaluate the improvement of fit between models, the definition of each indicator. Here is the cut point used to examine models, based on Bartholomew et al. (2008):

- Root-mean-square error approximation (RMSEA): This takes into consideration the number of parameters of the model, penalising those models that are not very parsimonious. Good models are located at lower than 0.08 (RMSEA < 0.08).
- Comparative fit index (CFI): This evaluates the fit of the model in relation to a null model for which the indicators have a covariance equal to zero. The indicator should be equal or close to 1 (CFI > 0.95).

[88] The program creates a random data set with the same numbers of observations and variables as the original data. After that, a correlation matrix is computed and then the eigenvalues. When the eigenvalues from the random data are larger than the eigenvalues from the factor analysis you know that the factors are mostly random noise. Stata FAQ. UCLA: Statistical Consulting Group, from http://www.ats.ucla.edu/stat/sas/notes2/ (accessed on March 21, 2013).
[89] Schmitt (2011) asserts that X^2 is not only affected by sample size and sample distribution, which is commonly stated as a criticism, but also by other model characteristics, so it should only be used for exploratory and preliminary interpretations.

- Tucker-Lewis index (TLI): It compares the chi-square of the null model with the model under evaluation. Models express a good fit when the indicator is equal or close to 1 (TLI > 0.95).
- Standardised root-mean-square residual (SRMR): It represents the standardisation of the mean of the covariance residuals. This indicator should be lower than 0.08 (SRMR < 0.08).

After determining the number of factors and to examine the selected model, a decision concerning rotation method needs to be taken. In order to facilitate the interpretation of the results and to allow correlations between factors, models were rotated using an oblique rotation (Schmitt, 2011). In the STATA software oblique rotation is offered by the method known as 'Promax'; in the MPlus instead oblique rotation offered by default is 'Geomin'. Both approaches provide similar results.

In sum, the procedures involved in the EFA were these: definition of the method of analysis; selection of the number of factors; model test and analysis of the items' loadings associated with each factor; removing from the model items with moderate or high loadings (from 0.3 to 0.6) in more than one factor and items with low loadings (< 0.4); new model estimation with the remaining items; and, lastly, analysis of the goodness-of-fit indicators in the final produced model.

Subsequently to the EFA estimation of the selected model, goodness-of-fit statistics were computed to find the best representation of the data for each latent concept and its associated observational variables. After that, factor scores of the selected EFA model can be produced in order to create new variables. Unfortunately, as the final models were produced through Mplus and this software does not estimate factor scores trough EFA, the selected models were recreated using the Confirmatory Factor Analysis (CFA) framework –also through Mplus.

Confirmatory Factor Analysis

Once final EFA models were selected, the structure defined for each latent concept (and the associations between latent concepts) was interpreted in the light of those theories seen in the theoretical chapter (Chapter III). After that, the selected models were recreated in Confirmatory Factor Analysis (CFA). The purpose of CFA was to construct models whose factor loadings revealed the strength of the existing association between the observed items and the latent variables, previously identified and confirmed through this process.

Following those assumptions, the CFA models pursued the same underlying factor structure (same number of factors and items) as the previously defined EFA models. However, the estimation of a CFA model demands the definition of a model structure with certain restrictions. As in the Latin-American literature review, it was not possible to find evidence to support any particular structure, CFA models produced in this study used restrictions established by default in MPlus[90]:

- Sets the path loading from each factor to the first indicator variable listed after BY, in order to identify the model.
- Frees the variances of the errors of the manifest (observed) variables.
- Sets the covariance between the errors of the observed variables to be 0; that is, it specifies no relationship between the manifest variables that is not accounted for by their relationship to the latent variable that predicts them, and/or the correlation between that latent variable and the other variables in the model.
- Frees the intercepts of the manifest variables and the variances of the latent variables.
- Frees the covariance between the latent variables; that is, it allows the latent variables to be correlated.

After that, factor scores were extracted using CFA models. The resulting variables were standardised, with a mean of 0 and standard deviation equal to 1. The continuous variables produced in this manner were used in multilevel regression models.

[90] See more in the Mplus user's guide, chapter 5: Confirmatory factor analysis and structural equation modelling. http://www.statmodel.com/ugexcerpts.shtml

IV.3.2.Logistic regression models

In order to assess individual, household and contextual factors which may have an influence on victimization risk, ecological studies have used either traditional regression approaches or hierarchical modelling. As the data used in this study were sampled following a cluster structure (5,860 individuals from 243 neighbourhoods), hierarchical, or multilevel models are the best option to model this data and to answer the main research questions. However, previous to the development of multilevel modelling, single-level logistic regression models were produced aiming to assess the contribution of household characteristics to household victimization risk. Both explanatory and dependent variables were measured at individual-level, to select the most relevant variables and to establish a baseline to be compared with results from multilevel models.

As victimization is a relatively rare event, either for violent or property crimes, and a person or household suffering more than one crime within their residential neighbourhood in a twelve months period is even less common, victimization measures are treated as dichotomy variables (victim/not victim). Because dependent variables are dichotomous and highly skewed - violating the assumptions of OLS regressions - logistic models are the most appropriate form of regression analysis.

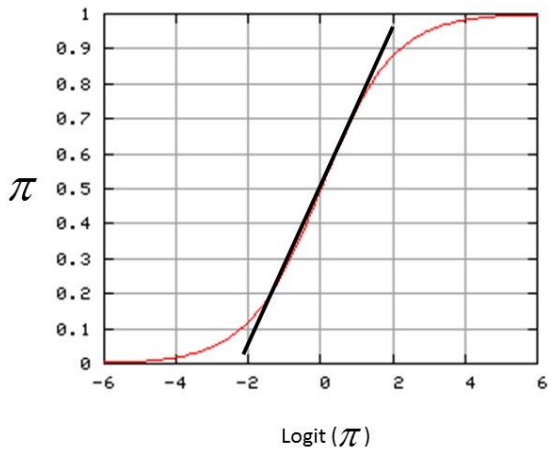
Regression models for binary response variables represent the probability *P(y=1)* for a randomly selected subject and this probability varies according to the values of the explanatory or independent variables (Agresti & Finlay, 2009: 483). So, from an exponential equation, where the exponent is a linear function of the independent variables, the logistic regression seeks to obtain the linear function that best classifies the individuals in one of the two subpopulations defined by the two values of the dichotomy dependent variable (Agresti & Finlay, 2009; Ferrán, 2001; Pardo y Ruiz, 2002). The graphic image of the logistic function is presented in the next figure.

As observed in figure IV.1, when the probability that the value of Y=1 (represented on the Y axis by Pi) is less than 0.2 or greater than 0.8, the binary logistic model fits the data less well compared to probabilities located in the middle position of the curve (Pr. > 0.2 < 0.8). In other words, the model may find it hard to differentiate between cases with

slightly different probabilities at either end of the distribution. Allison (2012)[91] argued that many researchers worry about the legitimate use of conventional logistic regression for data in which events are rare, but there are still a lot of misconceptions about this issue.

According to King and Zeng (2001)[92], the problem is not specifically the *rarity of events*, but rather the possibility of a small sample on the rarer of the two outcomes. Within small samples, the Maximum Likelihood estimator typically suffers greater risk of bias, and the degree of bias is strongly dependent on the number of cases in the less frequent of the two categories. But at what size can the event be considered rare? King and Zeng (2001) argued: 'If you have a sample size of 1,000 but only 20 events, you have a problem. If you have a sample size of 10,000 with 200 events, you may be OK. If your sample has 100,000 cases with 2,000 events, you're golden.' In this study, as the sample is close to 6,000 cases and the victimization events are around 350, or 6% (in each type of crime), the use of the logistic models is accurately.

Figure IV.1. Logistic Regression curve



Since the parameters of the logistic regression equation are estimated by the Maximum Likelihood method (MLE), certain assumptions need to be met. Jovell (2006: 27) has listed five: a) the model must be specified correctly; b) the model should not omit any

[91] ALLISON, PAUL (FEBRUARY 13, 2012), Logistic Regression for Rare Events. http://statisticalhorizons.com/logistic-regression-for-rare-events

[92] King, Gary and Langche, Zeng (2001). 'Logistic Regression in Rare Events Data,' *Political Analysis* 9: 137-163.

relevant independent variables in the prediction of the dependent variable; c) independent variables should not have measurement errors; d) the cases of the sample must be independent of each other; and e) there should be no linear relationship between the independent variables or multicollinearity. All variables included in models meet all these assumptions, with the exception of D, which is caused by the clustered type of sample. The infringement of this assumption justified the development of multilevel models after preliminary tests made with traditional regression models. Multicollinearity tests were included in the next chapter: Data Preparation.

Model construction

The variables were incorporated into the logistic model through the method 'Introduce'. This method includes all the variables at first and outputs in a single step the significance indicators of each independent variable and of the fit model (Visauta and Martori, 2003). To compare the contribution of each variable several models were constructed stepwise. To choose which variables to exclude, the results of the p-value of the Wald statistic were reviewed. This statistic contrasts the null hypothesis: $H_{0}: \beta_j = 0$, where β is the parameter associated with any independent variable X_j and indicates the contribution of each variable to the model. If the p-value of the Wald statistic is less than α, then the null hypothesis is rejected. The critical level of α was defined as 0.05. If the null hypothesis was not rejected - because the variable presents a p-value greater than the critical level - this variable was eliminated from the model.

$$pr\,(Yes) = \frac{e^{z}}{1+e^{z}} \quad \text{or} \quad pr\,(Yes) = \frac{1}{1+e^{-z}}$$

Where Z is the lineal combination of: $Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \ldots\ldots \beta_n X_n$
β_j are the coefficients estimated by each variable,
β_0 the constant
Xn the independent variables
e is the base of natural algorithms (2,718)
Logically, pr(No) = 1 – pr(Yes)

Source: Pardo and Ruiz, 2002; Ferrán, 2001.

When the process of variable selection ended, the coefficients of logistic regression (β) were estimated, constructing the multivariate models. Thus, the probability of an individual belonging to the group of victimised households is given by the prior formula:

Based on $\beta_0, \beta_1, \ldots, \beta_n$, the estimated probabilities of an individual or household belonging to the groups of 'victimized households' and 'non-victimized households' are respectively:

$$p = \frac{1}{1+ e^{-z}} \quad \text{and} \quad q = 1 - p$$

Model analysis: Coefficients and goodness-of-fit indicators

The regression coefficients presented in the analysis were the *Odds Ratio* (OR). Mathematically speaking the OR is the result of the division between two odds, and odds are an alternative way to express the likelihood of the occurrence of an event (Cerda, Vera and Rada, 2013). According to Moreno-Altamirano, López-Moreno and Corcho-Berdugo (2000), if the OR is equal to 1 there is no association between variables, that is, the event is not dependent on the presence of the assessed factor. If the OR has a value over 1 association between variables is positive, so a unit of change in the predictor variable is associated with a greater occurrence of the event. Then, the predictor variable can be assumed as a 'risk factor' of victimization. If the OR assumes, instead, values below 1, the association between variables is negative. In other words, the presence of the factor prevents the occurrence of the event; then, it can be considered as a 'protector factor' against victimization.

In order to evaluate the quality of the model, its theoretical and empirical consistency should be checked. If there are estimates that do not make sense, this is likely due to errors in the sample or measurement. In these cases, it is preferable to remove this variable. Also, it could happen that the estimators have the sign opposite to that expected and differ significantly from 0: this is a specification error that can be corrected by modifying the polarity of the variable, eliminating it or adding others (Jovell, 2009; Visauta and Martori, 2003).

To verify the goodness-of-fit of the model is to analyse how likely the sample results are from the adjusted model; this probability is called 'Verisimilitude'. For this, the statistical 'Likelihood-ratio test of independence' was used. This is a way to compare one model with a set of predictors to a simpler model (Agresti & Finlay, 2009: 493-95). In addition, through the chi-square statistic, we contrast the null hypothesis which says that, at each stage, the parameters associated with the variables included in the model are null. When the p-value associated with chi-square is less than 0.05 H_o is rejected (Jovell, 2009; Ferrán, 2001). In the place of R-Squared provided by linear regression models, logistic models in STATA provided Pseudo R-Square, which is based in Macfadden's Pseudo R-Square formula[93]. According to Freese and Long (2006)[94] to differentiate from traditional R-square, the Pseudo R-Square cannot be interpreted across different data sets; it is only valid when compared to another Pseudo R-squared (of the same type), using the same and predicting the same outcome. In this context, the higher Pseudo R-squared indicates which model better predicts the outcome.

As most of goodness-of-fit of the tested models in this thesis were very low, aiming to establish a comparison with an alternative model was examined: the Probit regression model. The main difference between Logistic and Probit is the link function, in Probit: $Pr(Y=1|X) = \Phi(X'\beta)$. The Probit curve also approaches the axes more quickly than the logistic curve, because logistic has slightly flatter tails. However, as the outcomes obtained from the two different models' approaches were very similar, the logistic model was preferred because outputs of this model can be more easily interpreted.

Through the comparison of the two types of models (logistic and Probit), the significance of each variable and the direction of its influence were confirmed, so just these two aspects of the associations between dependent and independent variables were interpreted in this study. The interpretation of coefficients was not considered due to the high risk of biases caused by the low capacity of the models. In fact, the main aim of the

[93] The log likelihood of the intercept model is treated as a total sum of squares, and the log likelihood of the full model is treated as the sum of squared errors. The ratio of the likelihoods suggests the level of improvement over the intercept model offered by the full model.
https://stats.idre.ucla.edu/other/mult-pkg/faq/general/faq-what-are-pseudo-r-squareds/

[94] Freese, Jeremy and Long, J. Scott, *Regression Models for Categorical Dependent Variables Using Stata* (College Station: Stata Press, 2006).

thesis is to establish the association between explanatory variables and victimization, but not the prediction of the phenomenon. Finally, all logistic regression models were developed using the software STATA 11.1.

IV.3.3. Multilevel modelling: Logistic mixed models

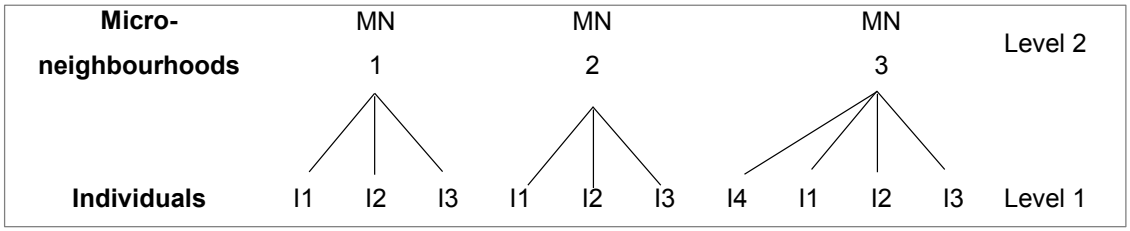
Multilevel modelling is a crucial aspect of this research. This type of analysis allows the main study questions and hypothesis to be addressed. The multistage sample design and resulting hierarchical structure of the study sample implies that to obtain correct estimates and standard errors, some statistical adjustment is needed to account for the non-independence between observations from the same cluster (Snijders and Boskers, 2012; Rabe-Hesketh and Skrondal, 2013). The hierarchical structure of the sample is defined by individual, first level units (level 1), which are grouped within micro-neighbourhoods, second level units (level 2) - see Figure IV.2. The hierarchical nature of the sample demands analytical tools that incorporate this structure, e.g. a multilevel regression model.

Multilevel regression models are the most accurate methods to represent this data structure and handle errors of measurement (Raudenbush and Sampson, 1999a). Considering that standard errors for coefficients (of explanatory variables) are correlated at neighbourhood level[95], multilevel models allow exploration of dependencies in hierarchical structures while avoiding biases in the inferences (Snijders and Bosker, 2012; Bartholomew et al., 2008). Besides, following the same authors, multilevel modelling is an outstanding method for testing the effects of contextual characteristics (level 2) on individual outcomes (level 1). In other words, multilevel regression models provide a flexible framework for modelling variances and correlations, replacing the conventional assumption that neighbourhood-effects are 'fixed', with the idea that neighbourhood-effects can be distributed or considered as *random effects* (Snijders and Boskers, 2012; Rabe-Hesketh and Skrondal, 2013).

[95] In a study sample based on clusters or groups, two randomly selected individuals from the same group will be more alike than individuals selected from different groups.

Multilevel regression models are used with the same aim as conventional regression models, namely, modelling the relationship between a dependent variable and one or more independent - explanatory variable. Nonetheless, this type of model acknowledges the different levels through which the data set is grouped: individuals (level 1) and micro-neighbourhoods (level 2), as seen in Figure IV.11. Thus, multilevel regression models allowed us to test the study hypotheses about the impact made by neighbourhood structural conditions (level 2) and community organisational mechanisms (at level 1 and level 2) on household violent and property victimization (at level 1), controlled for individual-level variables. This approach, as Brunton-Smith and Sturgis (2011) explained, allows estimation of the proportion of the variation in the dependent variable which is due to differences between observations *within* the same micro-neighbourhood, and which proportion is due to differences *between* micro-neighbourhoods.

Figure IV. 11: Hierarchical data sample



Source: Own elaboration based on the University of Chile study (2010).

As a consequence, through multilevel modelling it is possible to estimate the relative contribution of individuals and neighbourhoods to total variation in the dependent variables, as well as to estimate the contribution of neighbourhood-level measures (Snijders and Boskers, 2012). A series of *Random-Intercept Regression models* were estimated to test the study hypotheses. In these models, the intercept varies by each level-2 unit (or MNs), but the effect of the coefficients are kept fixed. In the case of binary dependent variables, household violent victimization and household property victimization, Mixed-Effects Logistic models were used. In next paragraphs the reasons of this option are explained. All models were estimated using STATA 11.1 software.

Multilevel logistic regression model

Based on definition of Snijders and Bosker (2012), the multilevel logistic regression model of random intercept is an extension of the logistic regression, considering the data structure of two-levels: a collection of *N groups* (level 2 units), with in group *j* (*j* = 1,…., N), and a random sample of n_j individuals (level 1 units). Where the outcome variable is dichotomous and expressed by $Y_{ij,}$ for level-one unit i in grup j, the two possible results are 0 'for failure' and 1 'for success'. The mean is M = $\sum_j n_j$ and the success probability in group j is P_j. In sum, the dichotomous outcome can be represented as the sum of this probability and a residual,

(5.1) $Y_{ij} = P_j + R_{ij}$ Basic multilevel logistic equation

The residual has mean 0, but for these binary-outcomes variables it can assume only the values of Pj and 1-Pj, since (5.1) must be 0 or 1. Thus, given the value of the probability Pj, the variance of residual is:

(5.2) var (R_{ij}) = Pj (1 – Pj)

While in the empty model for continuous outcome variables it was assumed that the level-one residual variance is constant. In this case, the groups have different within-group variances. Furthermore, the parameter ó^2 must be interpreted as the average residual variance. The group average is:

(5.3) $\hat{Y}_j = \frac{1}{nj} \sum_{i=1}^{nj} Yij$

This is the proportion of success in group j, an estimate of the group-dependent probability Pj.

The logit function: log-odds

As in the single-level logistic model, instead the probability of some event, the odds ratio were estimated and interpreted in this thesis. *The odds are the ratio of the probability of success to the probability of failure* (Snijders and Bosker 2012: 293). Then, the logistic regression model is a model where logit(p) is a linear function of the explanatory variables. The link function in the models will be, therefore, the logit function which is the only suitable function for transforming probability to arbitrary real values. This link function for a probability is expressed as *f (p).* After comparing the logit function with the probit link, the first was chosen considering the empirical fit of the model, ease interpretation and availability in the computer software used (Stata).

The random-Intercept model

According to Snijders and Bosker (2012:295), the empty two-level model for a binary variable refers to a population of groups (level-two units) and describes the probability distribution for the group-dependent probabilities P_j in (5.1), without including any explanatory variable. The model that specifies the transformed probabilities f (P_j), with a normal distribution, is denoted in the formula:

(5.4) $f(P_j) = Y_0 + U_{0j}$ Where Y_0 is the population average of the transformed probabilities and U_{0j} the random deviation from this average for group j. $f(P_j)$ is the log-odds for group j.

Thus, for the logit link function, the log-odds have a normal distribution in the populations of groups, which is expressed by:

(5.5) $\text{logit}(P_j) = Y_0 + U_{0j}$ For the deviations U_{0j} it is assumed that they are independent random variables with a normal distribution with mean 0 and variance t_0^2

As the authors explain, this model does not include a separate parameter for the level-one variance, this is because the level-one residual variance in this case follows from the success probability, as indicated in the equation (5.3). The probability to the average

value Y_0 is denoted by π_0 and defined by: $f(\pi_0) = Y_0$. Furthermore, the logistic transformation Y_0 the formula is:

(5.6) $\pi o = logistic(Yo) = \left(\frac{\exp Yo}{1+\exp(Yo)}\right)$

$Exp(Y_0) = e^{y0}$ express the exponential function. π_0 is close to the average value of the probabilities Pj in the population of groups.

Similarly than the logistic regression analysis, the random-coefficient logistic regression is based on linear models for the log-odds that include random effects for the groups (Snijders and Bosker (2012: 297). As was described, Yij is the binary variable for level-one unit I in the level-two unit j, the outcome Yij is coded 0 or 1. After the empty model is estimated, some potential explanations (explanatory variables) for the observed 'success outcome' can be considered. These variables are denoted by X_1, X_2… X_r. Since some of these variables could be level-one variables, the success probability is not necessarily the same for all individuals in a given group. Therefore the success probability now depends on the individual as well as in the group, denoted by P_{ij}, the initial equation (5.2) is now replaced by (5.7):

(5.7) $Y_{ij} = P_{ij} + R_{ij}$

Following the same authors, the logistic random intercept model expresses the log-odds, the logit of P_{ij}, as a sum of a linear function of the explanatory variables and a random group-dependent deviation U_{0j} (Snijders and Bosker (2012: 298):

(5.8) Logit $(P_{ij}) = Y_0 + \sum_{h=1}^{r} Y_h X_{hij} + U_{0j}$

In consequence, a unit difference between the X_h- values of two individuals in the same group is associated with a difference of Y_h in their log-odds, or a ratio of $\exp(Y_h)$ in their odds. The deviations U_{0j} are assumed to have zero means and variance equal to t_0^2. As Snijders and Bosker (2012) said, the formula (5.8) does not include a level-one residual because it is an equation for the probability Pij, which is included in the formula (5.7).

Finally, although the estimation of 'Random slope models' can help to explain how predictor variables influence the risk of crime victimization in each neighbourhood, some attempts to produce such analysis revealed that adding more complexity to models make them weaker in terms of the 'goodness-of-fit' indicators and, indeed, in some cases some crucial associations between variables become meaningless. Thus, in order to produce more parsimonious models for the extensive number of variables, like those tested in the hypothesis, only 'Random intercept models' was maintained as the selected method to produce multilevel modelling interpreted in the thesis. Undoubtedly, future research is needed in order to address the present study limitations and using a more robust dataset, those studies should test new interactions between individual and neighbourhood level variables and random slope models, along with random intercept models.

Estimation method

Multilevel regression models, both linear and logistic, commonly use the Maximum Likelihood (ML) as their estimation method. MLs 'produce estimates for the population parameters that maximise the probability of observing the data that are actually observed, given the model' (Hox, 2010: 40). Through the ML approach all regression coefficients, as well as all variance components, are estimated using the same method. According to Rabe-Hesketh & Skrondal (2012: 159) to estimate linear or logistic hierarchical models with random effects the minimum number of units of level-1 is not as important as the number of units of level-2: the level-2 units must be greater than 50 cases. In this study, the level-2 units are 242, and the level-1 units within each micro-neighbourhood are on average 23, as seen in the sample section.

Contextual model

In order to observe the differences between the neighbourhoods as well as the individuals/households in the neighbourhoods, the core variables of this thesis were disaggregated into level-1 variables and level-2 variables. A contextual model was used to produce such variables. This procedure involves the disaggregation of the independent-explanatory variables into two parts, a level-2 contextual effect and a level-1 effect. This disaggregation allowed the separation of the effects between group and

within group, to analyse how context variables impact on the dependent variable and account for how the structure of the neighbourhood affects the model (Paccagnella, 2006). The procedure carried out was as follows:

a) 'First-level effect'*:* to obtain the effect of the first level, the variables are subjected to a procedure of centring values with respect to the mean. Centring a variable consists of changing the value of the variable by adding or subtracting a constant. In this research, the scores of each explanatory variable at level-1 were centred with respect to the neighbourhood mean. The new variable was calculated according to the following formula:

$$x_{nij} - \bar{x}_{n.j}$$

Where, x_{nij} is the standardized score of the variable (n) to the individual (i), within the neighbourhood (j) $\bar{x}_{n.j}$ is the mean of the variable (n), within the neighbourhood (j). This estimation offers the deviation respect to the group mean.

These level-1 variables correspond to the effect within the neighbourhood of the independent variable on the prevalence of household victimization, for violent and property crimes.

b) 'Contextual effect': The contextual model re-incorporates the mean, which has been removed from the variable in the previous step, as an independent variable of level-2. Thus, in the multilevel models of this thesis for each group-centred organisational variable (level-1), a neighbourhood mean variable is added to the model (level-2). These level-2 variables correspond to the contextual effect or the effect that the average-score of each independent variable, within neighbourhoods, has on the prevalence of household victimization.

These disaggregation and aggregation decisions have effects on the estimation of the multilevel regression model. The contextual model, with variables centred on the group mean and the context mean, when re-entered into the model has fixed effects, intercept and random effects, which differ from a model with the variable in its raw state (Kreft, DeLeeuw, & Aiken, 1994). In this context, the level-1 and level-2 effects are interpreted as being 'within' and 'between' neighbourhoods effects.

The treatment of the variables in the contextual model has an additional methodological consideration: separating the pair of variables from the contextual model has effects on the structure of the model (Kreft & DeLeeuw, 1998). According to Kreft & De Leeuw (1998: 108): ‘using this centred score instead of the raw score will yield a model that is no longer equivalent to the raw model. We can re-establish equivalence if we add the subtracted mean back into the model, as an important between-group effect’. With the purpose of maintaining the equivalence of the data, the level-1 variables with their contextual-effect pair were always introduced together to the model. This methodological decision defines the work strategy through which the analysis was conducted, keeping the contextual model beyond the model construction process.

The eighteen variables of the contextual model, presented in Table IV.6, represent the nine components of the social and organisational life of the neighbourhood measured in this study. As mentioned above, these variables entered the models always in pairs, the first level effect with its contextual effect. For example, the level-1 effect of ‘Perception of social cohesion at individual level’ was introduced into the model in conjunction with the contextual effect or level-2 effect, ‘The neighbourhood mean of social cohesion’.

Table IV.6. Variables included in the Contextual Model

	Level	Description
Informal - community networks		
Feelings toward community	1	First-level effect: Factorial standardized score of feelings toward community, centred on the neighbourhood mean for the same factor.
Mean of feelings toward community	2	Contextual effect: Neighbourhood mean of the factorial standardized score of feelings toward community.
Social interactions	1	First-level effect: Factorial standardized score of social interactions, centred on the neighbourhood mean for the same factor.
Mean of social interactions	2	Contextual effect: Neighbourhood mean of the factorial standardized score of social interactions.
Collaboration	1	First-level effect: Factorial standardized score of collaboration, centred on the neighbourhood mean for the same factor.
Mean of collaboration	2	Contextual effect: Neighbourhood mean of the factorial standardized score of collaboration.
Friendship ties	1	First-level effect: Factorial standardized score of friendship ties, centred on the neighbourhood mean for the same factor.
Mean of friendship ties	2	Contextual effect: Neighbourhood mean of the factorial standardized score of friendship ties.
Collective efficacy		
Social cohesion	1	First-level effect: Factorial standardized score of social cohesion, centred on the neighbourhood mean for the same factor.
Mean of social cohesion	2	Contextual effect: Neighbourhood mean of the factorial standardized score of social cohesion.
Informal control	1	First-level effect: Factorial standardized score of informal control, centred on the neighbourhood mean for the same factor.
Mean of informal control	2	Contextual effect: Neighbourhood mean of the factorial standardized score of informal control.

Table IV. 6: Variables included in the Contextual Model (continuation)

Public controls		
Perception of police	1	First-level effect: Factorial standardized score of perception of police, centred on the neighbourhood mean for the same factor.
Mean of perception of police	2	Contextual effect: Neighbourhood mean of the factorial standardized score of perception of police.
Perception of municipality	1	First-level effect: Factorial standardized score of perception of municipality, centred on the neighbourhood mean for the same factor.
Mean of perception of municipality	2	Contextual effect: Neighbourhood mean of the factorial standardized score of perception of municipality.
Police-community nexus	1	First-level effect: Factorial standardized score of police-community nexus, centred on the neighbourhood mean for the same factor.
Mean of police-community nexus	2	Contextual effect: Neighbourhood mean of the factorial standardized score of police-community nexus.

Analytical model and variables

Figure IV.12 shows the variables and associations tested in the multilevel logistic regression models. Three different groups of variables are observed that have effects on the dependent variables of 'Household violent victimization' and 'Household property victimization'.

a) *'*Structural or Exogenous variables': The two structural variables are neighbourhood level variables, which are located at level-2 at the bottom of the figure. The regression modelling tested whether these variables exerted a direct effect on the dependent variables or not, and whether or not they exerted an indirect effect mediated by the community-organisational variables ('Informal networks and collective efficacy') and by the perception of public control institutions.

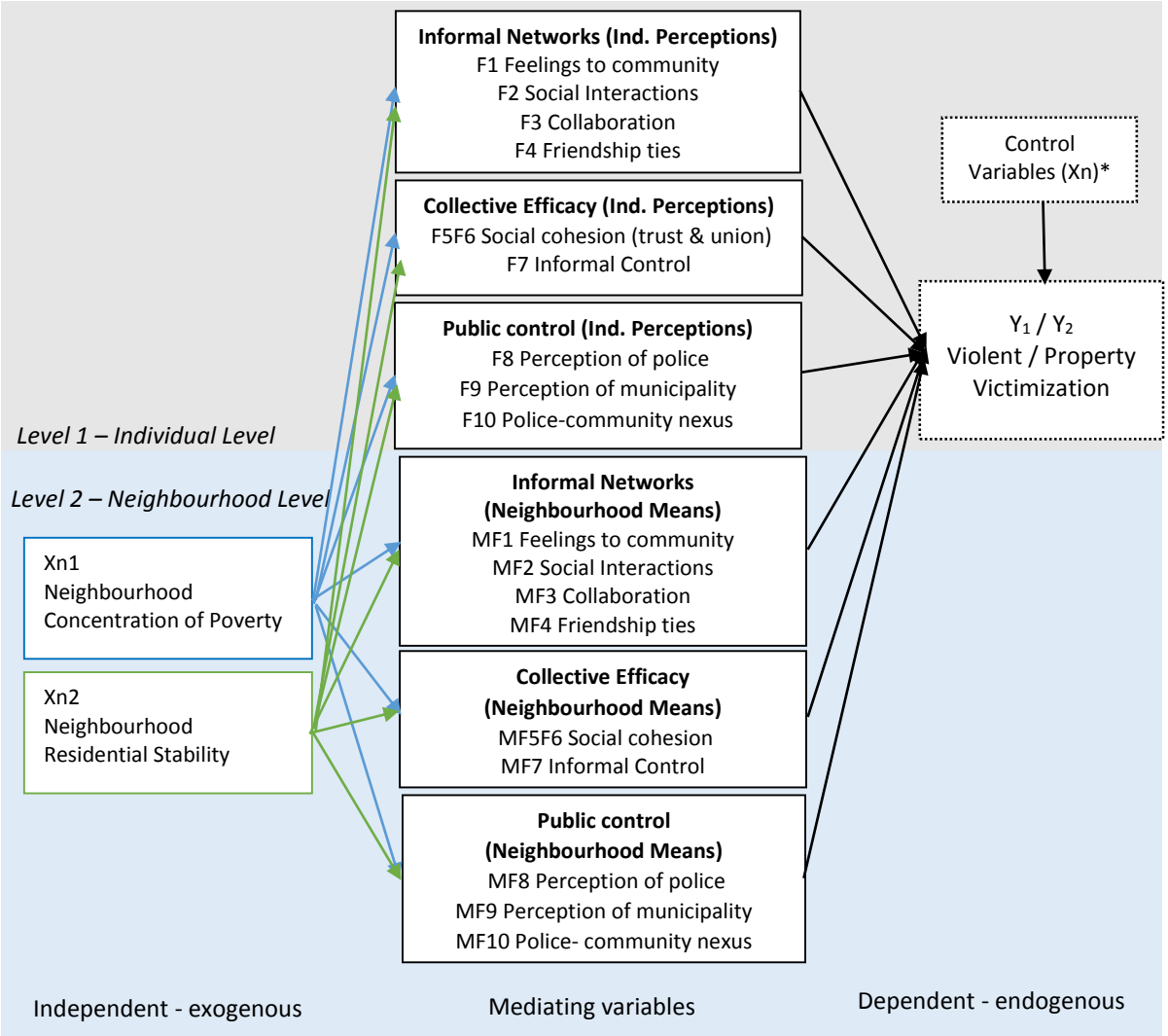
b) 'Independent or mediating variables': These variables would have a direct effect on the dependent variables ('Violent and property victimization') and, in turn, would mediate the effect of structural variables on those dependent variables. They are located at level-1 and level-2 and are shown at the bottom and top of the figure,

corresponding to ‘Informal networks’, ‘Collective efficacy’ and ‘Public control attributes’. These variables were analysed by entering them in pairs into the multilevel models, the level-1 variable (first-level effect or the group-centred variable) together with its level-2 pair (contextual effect or neighbourhood mean variable).

c) ‘Control variables’: All control variables tested in multilevel models are household-level variables, ‘Female household head’, ‘Presence of children at home’, ‘Educational level of household-head’, ‘Working position of household head’, ‘Income dependency’ and ‘Length of residence’. These variables are illustrated in the top part of Figure IV.12.

The detailed description of all variables tested in multilevel models, their conceptual definition, operationalisation and descriptive statistics were previously presented in this chapter.

Figure IV. 12. Extended model of social disorganization to explain victimization



Source: own elaboration based on literature review and hypothesis

Notation:
- Circles represent latent concepts shaped by two or more latent variables.
- Squares represent observed and latent variables included in multilevel regression models.
- Arrows represent associations (+ or -) tested through multilevel regression models.

* Control variables at household level are: female household head; presence of child at home, educational level and working position of the household head, income dependence and length of residence.

IV.4. Study challenges, potential contributions and ethical issues

As discussed in Chapter 2, **neighbourhoods** have been a central part of public policy designs and, research in recent decades. According to Lupton (2003), academic research on neighbourhoods have been carried out in two different strands. Firstly, the community studies, which has the longest history and is a traditional domain for sociologists, anthropologists and geographers. This type of studies are mainly based on case study designs and qualitative methods. Secondly, more recently there has been a growing interest in the study of neighbourhoods-effects on a wide range of social and economic outcomes. This type of studies are typically developed by economists or sociologist using statistical tools (Lupton 2003). It is this second approach that was employed in this thesis.

As Lupton (2003) asserts, neighbourhood-effects studies are not only interested in understand social phenomenon in deprived neighbourhoods, but also in non-deprived areas, and differences between them. A great body of literature have been accumulated measuring neighbourhood-effects on child and young people development, educational, health and other social policies outcomes, young people risky behaviours, among others, and although the evidence is often significant the empirically tested effects are mostly reduced (Lupton 2003). In the same token, findings of the present study were mostly significant, even if they had moderate effect sizes.

The present research, as other neighbourhood-effects studies had to deal with two problems: the ambiguity of the neighbourhood definition and the delimitation problem. These issues were discussed in Chapter 2, however, the key methodological limitations are recapped below.

Concerning the ambiguity of the neighbourhood definition, a limitation observed in ecological crime studies have been the lack of a theoretical conceptualization of neighbourhood. This weakness are mainly explained by the limitations of the available contextual data, which has produced that most studies have delimited neighbourhood boundaries based on Census tracts or block groups - as Sampson et al. (2002: 445) and Dietz (2002: 541) pointed out. The main consequence of this approach is that study's findings are often meaningless and misleading (Lupton 2003; Dietz 2002). By having a

more complex reflexion of the concept, qualitative studies have a clear advantage, over quantitative studies, and thereby, providing a better connexion between findings and policies development.

Based on the previous discussion (in chapter 2), it is possible to summarise that definition of neighbourhoods should considered three challenges: One, there is not a single generalizable definition of neighbourhood and its boundaries, this definition may change across different social contexts, time, and indeed, between diverse residents (Taylor 2012, Galster 2001). Two, as Lupton (2003) argued, since the concept involve people and place, it is the interaction between them that produce the neighbourhood features, and then both level of analysis should be considered in neighbourhood-effects studies. Three, neighbourhood is always a small part of a wider context, so study's finding should not be interpreted in isolation (Tapia 2013; Lupton 2003).

The data available for the present study mean the ability to address these concerns is limited. Still much effort was spent developing a complex theoretical definition consistent with the operational delimitation of the 'study unit', as a small area defined through geographical limits and Census Data. Results of the survey analysis demonstrated that a high proportion of respondents described the neighbourhood boundaries with a similar extension to that the used in the data sample design. Besides, one of the main advantage of the quantitative approach applied here, over qualitative studies, is that it allow the generalization of results across the diverse types of neighbourhoods involved in the study sample. However, at the same time, due to the cross-sectional nature of the data, interpretations that assume causal relationships must be treated with caution. The development of longitudinal studies to confirm findings and emergent hypotheses is an evident need for future research in this field.

The review of neighbourhoods-effect studies on health outcomes, by Dietz and Mair (2010), highlighted that observational (cross-sectional) studies on neighbourhood-effects share the same difficulties than most observational studies in the demonstration of causal inference. One reason of this limitation derived from the impossibility in fully accounting for all individual-level characteristics, crucial to predict health outcomes (Dietz and Mair

2010). In the present study, most socioeconomic household-level variables were tested as control variables, but only the most significant of them were kept and controlled in multilevel models. Nonetheless, it is evident that some important household-level variables were omitted in the original dataset and required be considered in future studies, for instance, measures about family daily time spent outside home.

In addition, individuals may select (or be selected into) the place where they live based on their family characteristics or their predisposition to certain behaviours. As Dietz and Mair (2010) argued this 'self-selection' bias produces a threat to causal inferences in cross-sectional studies. Such concerns may apply to the present study, when determining substantial causal relationship reducing threats and biases result evident that longitudinal research design is preferential (Small, 2002; Rhineberger-Dunn and Carlson, 2009; 2011). Again, these limitations are handled through cautious interpretation of the statistical analysis. For instance, associations between variables will be interpreted assuming causal ordering based on the literature review, while presenting alternative explanations where appropriate

The need for future longitudinal studies to test hypothesis concerning crime victimization outputs can be also suggested to account for the association between the current cohort data with historical trends in neighbourhood delinquency – as Dietz and Mair (2010) argued in the context of health studies. Additionally, longitudinal data would allow to measure residential mobility of families or individual over time, as well as to examine effects of changes in neighbourhood features (e.g. local policies economy outcomes) which can be affecting the study outcomes.

Another common limitation observed in neighbourhood-effects studies have been the measurement of specific neighbourhood-level attributes considered relevant in study hypothesis, as Dietz and Mair (2010) asserted. In the field of ecological crime studies have been significant advances over the last decade. For instance, Systematic Social Observation methods have been applied to measure physical and social disorder variables, which may be potentially associated with specific crime rates and victimization (Sampson et al 1999; Sampson 2003). Additionally, GIS approaches have been used to

estimate the presence of institutions and other public policy resources, and also estimate distance and density measures. In sum, the use of community surveys combined with alternative socio-spatial methods, have made significant contributions in the reduction of measurement biased that may occur in neighbourhood-level indicators based on aggregated self-reported perception (Dietz and Mair 2010).

Most variables used in this study were measured through self-reported perceptions about neighbourhood and community resources, and the majority of neighbourhood-level variables derived from the aggregation of the same measures. Despite that, since most questions and/or scales had been previously validated in similar studies and the reliability of the aggregated-contextual effects proved to be good, the impact of this can be argued to be limited. For instance, the scale 'Informal control' measures people's perception of their neighbours' willingness to engage in informal control actions (or the likelihood of an intervention). Although this scale does not measure the actual exercise of informal control, previous studies provide support for the use of this measure as a close proxy for the concept (e.g. Sampson et al., 1997; Morenoff et al., 2001; Rhineberger-Dunn and Carlson, 2009; 2011). Even so, it can be suggested that future studies should include questions that directly measure the exercise of informal control, as well as of public control, and/or complement indicators.

Finally, the last type of limitation often expressed in neighbourhood-effects studies are linked with the test of interactions between individual-level variables and neighbourhood features, which have not always been considered consistently. The most frequently used approach to examine these interactions has been the inclusion of interaction terms in regression models (Dietz and Mair 2010). However, in crime victimization studies based on SDT and CET the inclusion of interaction terms is not very common and in cases tested the direction of interaction has not always been consistent. According, Dietz and Mair (2010: 135) as testing interactions requires substantial variation in individual-level characteristics within neighbourhoods, limited sample size and insufficient variation in individual-level characteristics, has prevented the use of interaction terms in a more frequent and consistent way.

In the present study, although the sample size is not reduced, most household-level characteristics are categorical variables and, so, did not express sufficient variability to produce good interaction terms. In fact, some interaction-terms were produced and tested in models but those outputs did not offer significant results. Thus, further studies are needed considering designs with better sampling size regarding the number of cluster and the average size of each cluster and better measurement strategies to measure socioeconomic variables, such as the family income level and residential stability.

Despite the limitations outlined above, it is noteworthy that the large size of the sample (5,860 cases), the robustness of the data set (random selection at all stages, reduced missing cases), the hierarchical structure of the data (individuals nested in neighbourhoods), and the use of measurements largely tested in international studies (but adapted to the Chilean context), offer a unique opportunity to evaluate theoretical hypotheses and improve the understanding of experience of victimisation across Santiago. The ecological theories and hypotheses tested are based on previous work in developed countries (notably the USA and Europe), the confirmation or refutation of those in a completely different context (Latin-America) would imply a significant contribution to knowledge production in this particular area of criminology.

In addition, considering that Santiago is a large, segregated city, which shares several features with other metropolitan cities of Latin America, the findings of this study could contribute significantly to the development of further research around ecological perspective of crime throughout the region. The evidence produced in the study can contribute to the promotion of preventative policies at local level, through the development of residents' attachment to their neighbourhood, increased social cohesion and community-police partnerships.

Concerning potential ethical issues, although research focused on delicate and severe problems such as crime victimization, and those who work with vulnerable communities are commonly required to satisfy rigorous ethical procedures (e.g. informed consent), since this study was based on secondary data it could be argued that these concerns are reduced. The research team at the University of Chile ensured the complete

confidentiality and anonymity of survey respondents, and for that reason the study data set did not include the identification of interviewees or communities involved. On the contrary, with the results of the research it is expected to reach recommendations for improving crime prevention policies which directly affect the quality of life of such vulnerable communities.

IV.5. Appendix. Income Imputation

IV.5.1. Method selection and justification

The variable “household income” presented 1,554 missing values (31% of the sample.) For this reason, it was necessary to carry out an imputation process; accordingly, the bibliography was reviewed so as to evaluate different methodological options and limitations of same and select the most adequate imputation method (Sande, 1982; Horton & Lipsitz, 2001; Olinsky et a., 2003; Acock, 2005; Barceló, 2008; Restrepo & Marín, 2012).

The simplest imputation method is to eliminate the incomplete cases. However, Sande (1982) and Barceló (2008) stated that said methodology increases inefficient statistics, because it reduces the sample. Hence, its use is not appropriate in this case taking into account the high number of missing values in the variable “household income”. In addition to this, Horton and Lipsitz (2001), and Olinsky et al. (2003), argued that if the no-answer rate is systematic in nature, employing only the available data items implies a bias.

Another imputation method is to estimate the mean of the variable under study and use said value as a substitute for the missing cases. A disadvantage of this method is the variance reduction since all the data items are imputed with a constant value. In this way, as stated by Acock (2005), this approach is not adequate for random data even more so when we consider the fact that extreme cases do not generally declare in the variable ‘income’. Likewise, and above all, we should consider the hierarchical character of the sample in which individuals living in the same neighbourhood should have greater similarities of income among themselves when compared to those individuals from another neighbourhood.

Finally, imputation can be made by means of either simple or multiple regression. This method operates by predicting the values of ***y*** (the variable to be imputed) on the basis of correlated covariates. The predicted values of ***y*** are used to impute the missing values. A drawback of this technique is that when missing values are not randomly distributed, this method tends to bias the measures of association and variability (Restrepo & Marín, 2012). Additionally, the distinction between the simple and multiple imputation method

lies in the number of regression models generated to achieve the imputed value. In a simple imputation, only one model is generated by means of which the necessary values to replace the missing cases are obtained. In contrast, in a multiple imputation, two or more models are generated, and they permit the mean estimation for the predicted values of **y** in order to replace the missing cases (Medina & Galván, 2007).

In the present study, multiple regression models were estimated including different sets of variables. However, after that, a single mean of all model outcomes was estimated in order to replace the missing income data. Thus, the income imputation was carried out by following the single imputation method with a view to recovering most of the missing cases in the variable 'income.'

IV.5.2.Procedure to carry out the single imputation method

Step 1. Firstly, a descriptive analysis was made as regards the variables that directly or indirectly allow the socio-economic characterization of the individuals and households represented in the sample; particular attention was paid to percentage distribution or descriptive statistics and the number of missing cases. In table 1 the variables under analysis are summarized.

Table 1. Descriptive Statistics of Variables Included in Multiple Imputation Models

Dependent Variable	Categories	Percentages
Household income	US$ 0 - $353	17.1%
	$355 - $ 490	17.6%
	$491 - $ 627	20.5%
	$628 - $784	13.4%
	$785 - $921	8.8%
	$922 - $1,176	7.5%
	$1,177 - $1,470	4.6%
	$1,471 - $1,960	4.5%
	$1,961 – $3,332	3.7%
	$3,333 or more	2.4%
	Missing cases	1875
Explanatory Variables	Categories	Percentages
Income dependency[96]	High level	31.4%
	Medium level	28.2%
	Low level	17.6%
	Very low level	22.7%
	Missing cases	0
Age of household head	Minimum	18
	Maximum	98
	Mean	52.2
	Standard	15.3
	Missing cases	0
Gender of household head	Male	70%
	Female	30%
	Missing cases	0

[96] This variable is a proportion between household members who contribute to family income and the other household members, codified in four categories.

Table 1. Descriptive Statistics of Variables Included in Multiple Imputation Models (Continuation)

Explanatory Variables	Categories	Percentages
Educational level of household head	Primary or no schooling (0-8 years)	21.7%
	Secondary (9-12)	54.6%
	Higher education (13 years or more)	23.6%
	Missing cases	98
Main activity of household head	Occupied	67.8%
	Unemployed	2.7%
	Retired	22.5%
	Inactive (student, housewife or disabled)	6.9%
	Missing cases	30
Working status of household head	Manager	12.4%
	Self-employed	16.1%
	Employed	39.2%
	Unemployed	2.8%
	Retired or Inactive	2.9.5%
	Missing cases	53
Health insurance system of household head	Public	77.1%
	Private	22.9%
	Missing cases	278
Pension system of household head	No	37.4%
	Yes	62.6%
	Missing cases	286
Households receiving State benefits	No	77.8%
	Yes	22.2%
	Missing cases	171
Geographic zone[97]	Historical city centre	5.9%
	First ring	61.2%

[97]This variable was created on the basis of the geographic classification developed by Mattos, Fuentes and Link (2014), Districts were coded in the following manner:
- Historical city centre: Santiago district
- First ring: districts of Cerrillos, Cerro Navia, Conchalí, El Bosque, Estación Central, Independencia, La Cisterna, La Granja, La Pintana, Lo Espejo, Lo Prado, Macul, Ñuñoa, Pedro Aguirre Cerda, Providencia, Recoleta, Renca, San Joaquín, San Miguel, and San Ramón;

	Outer ring of high-income households	8.4%
	Outer ring of middle and low income household.	24.6%
	Missing cases	0
Concentration of socio-economic groups in the neighbourhood (Z score)	ABC1	Min: -0.54 Max: 5.96 Mean: 0.37 Std.D.: 1.28 Missing cases: 0
	C2	Min: -1.55 Max: 3.05 Mean: 0.51 Std.D.: 1.07 Missing cases: 0
	C3	Min: -2.92 Max: 3.79 Mean: 1.36 Std.D.: 1.17 Missing cases: 0
	D and E	Min: -2.34 Max: 1.84 Mean: -0.54 Std.D.: 1.03 Missing cases: 0

Step 2. Secondly, several models of multiple linear regression were tested always using the variable 'Household Income' as a dependent variable and employing the other socio-economic variables analysed in the previous step as independent variables. The procedure used to build the models is the following:

(1) The variables were incorporated into the model by using the "enter" method, that is, testing the predictive capacity of each variable separately, and then, of all of them as a whole;

(2) The variables per category were alternated in order to generate different models and increase the number of missing cases imputed.

Step3.Subsequently, six models with the highest predictive capacity for the variable "household income" were selected, according to the Adjusted R Squared indicator (ranging between 0.46 and 0.5.) Non-standardized predicted values were maintained for each of the six models. Finally, the mean for the six new variables was calculated and this mean was correlated to the original income variable "Household income (10 categories.)" In this way, high levels of association among the new variables and the original one was evidenced (Pearson between 0.6 and 0.7) (see Table 2).

- Outer ring of high-income households: districts of Las Condes, Vitacura, La Reina, and Lo Barnechea;
- Outer ring of middle and low income households: districts of Huechuraba, La Florida, Maipú, Peñalolén, Pudahuel, Puente Alto, and San Bernardo.

Table 2. Adjusted R-Squared, Pearson Correlation and Missing Cases

	Adj. R-Squared	Pearson Corr.*	Missing cases
1	0.467	0.69**	388
2	0.494	0.70**	385
3	0.459	0.68**	273
4	0.497	0.71**	384
5	0.460	0.68**	127
6	0.462	0.68**	151
Mean1	-	0.69**	127
* Pearson correlation was estimated among new variables and "Household income (10 categories)" / ** Sig. (2-tailed) of 0.00			

Step 4. In this step, the database was segmented according to the variable 'geographic zones in the city', and the respective subsamples were tested by using the previous models. For each segment, the model with the highest explanatory capacity was selected (adjusted R squared). Then, for the resulting model, the non-standard predicted values were kept (see Table 3). Afterwards, the values obtained were included into the complete database, hence obtaining a new variable (Mean 2.) This new variable evidenced a correlation of 0.7 regarding the original income variable and 384 missing cases (see Table 4).

Table 3. Adjusted R-Squared in Subsamples

	Adjusted R Squared
Historical city centre	0.351
First ring	0.332
Outer ring of high income households	0.807
Outer ring of middle and low-income h.	0.352

Step 5. Finally, a new mean was calculated out of 'Mean 1' and 'Mean 2' variables. This mean, denominated 'Mean Total', had 127 missing cases and a strong association level (Pearson > 0.7) with the original "Household income" variable. Next, once the new variable and the original variable were contrasted, it was possible to detect which missing cases of the original variable could be completed with data from the new variable, and

the data transfer was hence made. By means of this procedure and applying the weight at household level, the 1,875 missing cases in the original variable were reduced to only 58 cases.

As evidenced in Table 4, the new income variable shows similar statistics to the ones of the original variable: minimum, maximum, mean, and standard distribution. Likewise, as observed in Table 5, the case distribution, all throughout the categories of both the original and new variables, proves to be rather similar, with the exception of some differences in the lower-income categories. However, these differences are weakened when the new variable is recoded to five categories and compared to the old five-category variable. This new income variable with five categories shall thus be included in the logistic regression models in Chapters 6 and 7 of this thesis (please see Table 6).

Table 4. Descriptive Statistics of New Income Variables (Models' predicted values)

		Income_10	MEAN1	MEAN2	MEAN TOT	New_Income10
N	Valid	**3986**	5733	5476	5733	**5802**
	Missing	**1875**	127	384	127	**58**
Mean		3.8	4.0	4.0	4.0	4.0
Median		3.0	3.6	3.5	3.6	4.0
Std. Deviation		2.4	1.8	1.9	1.8	2.3
Minimum		1.0	0.5	0.5	0.6	1.0
Maximum		10.0	10.8	10.7	10.7	10.0
R-Squared (with Income_10)		-	0.69**	0.70**	0.70**	1.00**

Table 5. Percentage distribution for both the original income variable and the imputed income variable (10 categories)

Ten-category Household Income		
	Original variable	New variable
US$ 0 - $353	17.1%	12.0%
$355 - $ 490	17.6%	15.5%
$491 - $ 627	20.5%	21.5%
$628 - $784	13.4%	17.5%
$785 - $921	8.8%	10.3%
$922 - $1,176	7.5%	7.7%
$1,177 - $1,470	4.6%	4.8%
$1,471 - $1,960	4.5%	4.7%
$1,961 – $3,332	3.7%	3.6%
$3,333 or more	2.4%	2.3%
Total valid cases	3986 (100%)	5802 (100%)
Missing cases	1875	58

Table 6. Percentage distribution for both the original income variable and the imputed variable (5 categories)

Five-category Household Income		
	Original variable	New variable
US$ 0 - $490	34.7%	27.5%
$491 - $ 784	33.8%	39.0%
$785 - $ 1,176	16.3%	18.0%
$1,177 - $1,960	9.0%	9.5%
$1,961 or more	6.1%	6.0%
Total valid cases	3986 (100%)	5802 (100%)
Missing cases	1875	58

CHAPTER V. DATA PREPARATION: BUILDING EXPLANATORY FACTORS

V.1. Introduction

This chapter defines the independent variables that will be used in logistic regression models and in multilevel models to study experiences of household victimization, both within and between Santiago neighbourhoods. Considering that most of the theoretical concepts in this study are measured by multiple variables (perception scales and/or multiple-choice questions), and in order to identify latent constructs underlying these observational variables, Exploratory Factor Analysis (EFA) was applied. EFA models were estimated using Stata and Mplus software with the purpose of taking advantage of the virtues of each program, and of comparing the results obtained by each one (See Methods and Data chapter for more details).

Prior to the factor analysis estimation, as was explained in the Methods chapter, the continuous variables were examined through statistical descriptive analysis with the aim of evaluating the normality of the variable and transforming it into a categorical variable, if they have a no-normal distribution (e.g. numbers of relatives and close friends living in the same neighbourhood).

After EFA analysis, correlations between obtained latent factors will be considered to confirm associations between the concepts addressed in the Literature Review chapter. In addition, goodness-of-fit statistics were computed in Mplus to find the best representation of the data for each latent concept and its associated observational variables. Unfortunately, MPlus does not allow factor scores to be created from an EFA model. For that reason, a model with the same factor structure as the selected EFA model was recreated (using the same number of factors and the same items associated, in each case), within the Confirmatory Factor Analysis (CFA) framework. After that, factor scores were extracted using CFA models. The continuous variables produced in this manner were used in subsequent analysis (See Methods and Data chapter for more details).

In the third section of this chapter, multicollinearity diagnoses were developed with the aim of finding potential collinearity problems between the recently created latent factors. In this context, two different analyses were produced: a correlation analysis based on the correlation matrix, and a linear regression model which included the VIF test (Variance Inflator Factor). Findings from this analysis demonstrated that only two factors showed a severe multicollinearity problem. This issue was immediately solved in this chapter -merging the problematic factors in one-, so in the next chapter regression models can be carried out with complete confidence in the quality of the selected variables.

Finally, the conclusion section summarises the main findings of this chapter concerning the building of continuous variables, which measure social and organisational mechanisms or attributes that can explain Experienced Household Victimization within Santiago neighbourhoods. In theory, these variables were part of latent concepts such as 'Informal networks' (Feelings towards neighbourhood, Friendship ties, Social interactions and Collaboration), 'Collective efficacy' (Social cohesion and Informal control) and 'Public control' (Perceptions of police, Perceptions of municipality services and the Police-community nexus), but as confirmed through the factor analysis these measures represent separate and independent latent concepts, with only moderate correlations.

V.2. Factor Building: Exploratory and Confirmatory Factor Analysis

V.2.1. Factors relevant to the concept of 'Informal - community networks'

Definition of 'Informal – community networks'

In 1974 Kazarda and Janowitz developed a systemic model of community, in which they defined community as 'a complex system of friendship and kinship networks, formal and informal associational ties rooted in family life and on-going socialization processes' (1974: 329). Residents' Feelings towards their community are a relevant factor to explain why some neighbours collaborate with others or become involved in local organisations to deal with local problems (Kazarda and Janowitz, 1974). Based on this definition, was decided to explore the influence of four community factors or mechanisms: 'Community

attachment or Feelings towards neighbourhood', 'Friendship ties', 'Social interactions' and 'Collaboration'.

Community attachment or Feelings towards the neighbourhood

Kazarda and Janowitz (1974) measured attachment towards a person's neighbourhood or residential area through two questions: 'How interested are you to know what goes on in your neighbourhood?' 'Supposing that for some reason you had to move away from your neighbourhood, how sorry or pleased would you be to leave?' They considered neighbourhood as the surrounding area of home (around 10 minutes' walk).

Similarly, in the Santiago survey this concept was measured through a 5-point Likert scale, which asked: 'Thinking about your neighbourhood, how much do you agree with the following statements?' The available answers ranged from 'Strongly disagree' to 'Strongly agree' and include five sentences: 'Most neighbours like living here'; 'Most neighbours would not move out from their residence soon'; 'Most neighbours don't like that their children grow up in this area'; 'Most neighbours are identified with the history and features of the neighbourhood'; 'Most neighbours feel discriminated against for living in this area'. As items 3 and 5 were expressed in a negative sense, their polarity was reversed.

Friendship ties

Kazarda and Janowitz (1974) measured friendship and kinship ties through questions in which they asked for the number of friends and relatives who live outside and within a 10-minute walk of the resident's home. In Sampson and Groves' (1989) study respondents were asked how many of their friends reside in the local community (area within a 15-minute walk of the resident's home), having a five-point scale ranging from none to all as alternative answers.

In the present study a similar question was used: 'How many relatives and friends live in your neighbourhood?' But the answer was not restricted to a scale. Then, the non-normal distribution of the variable compels to transform this variable into an ordinal one: 1. 'Do not have relatives and friends in the local area'; 2. 'Have between 1 and 2'; 3. 'Have between 3 and 6'; 4. 'Have 7 or more relatives and friends'.

In addition, the survey asked for the frequency of contact with these relatives and friends in the local area, with possible answers ranging from three or more days per week to never or rarely. In the last alternative persons were added who in the previous question answered that they do not have friends or relatives in the neighbourhood. The resulting categories are: 1. 'Never or rarely' (0 friends or rarely have contact); 2. 'Few times' (one, two or three times per month); 3. 'Almost always' (one or two times per week); 4. 'Always' (three or more times per week).

Informal associational networks: Interactions and collaboration among neighbours

Measuring neighbours' involvement in informal activities and networks, Kazarda and Janowitz (1974) asked about participation in activities within the local area, such as visiting cinema, public parks or gardens, and practising football, among others. Nevertheless, in latter ecological studies that measure was replaced by the frequency with which people exchange advice and favours, share celebrations, and make other collaborative actions, without the requirement of being relatives or close friends[98] (Sampson et al., 1997; Morenoff et al., 2001). In the social capital literature, the strength of networks is often addressed through scales which measure different types of interactions and collaborative actions in which people are involved within local contexts (Grootaert et al., 2004: 5).

The scales of The Project on Human Development in Chicago Neighbourhoods were adapted to the Chilean context and resulted in two 5-point Likert scales which measure the frequency with which neighbours get involved in different types of social relationships within their neighbourhood, with answers ranging from 'Never' to 'Always'. The scale of 'Social interactions' asked: 'How often would you say that the following situations occur in your neighbourhood?' The five sentences of this scale are presented in Table V.1. The scale of 'Collaboration' enquired: 'How often would you say that neighbours organise actions, such as the following?' The five sentences of this scale are also presented in Table V.1.

[98] Scales included in the 'Community Survey Questionnaire' of The Project on Human Development in Chicago Neighbourhoods (1994-1995), a project carried out by Earls, Brook-Gunn, Raundenbush and Sampson.

Table V. 1. Scales of Informal - community networks

Sentiments towards the neighbourhood
Q.26 Using the following scale, and thinking about your neighbourhood, how much do you agree with the following statements? (Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree) 26.1 Most neighbours like living here. 26.2 Most neighbours would not move out from their residence soon. 26.3 Most neighbours don't like that their children grow up in this area (reverse polarity). 26.4 Most neighbours are identified with the history and features of the neighbourhood. 26.5 Most neighbours feel discriminated against for living in this area (reverse polarity).
Friendship ties
Q.65 How many relatives and friends live in your neighbourhood? Answer categories: a) Do not have relatives and friends in the local area; b) Have between 1 and 2 relatives and friends; c) Have between 3 and 6 relatives and friends; c) Have 7 or more relatives and friends. *Q.66 Frequency of contact with these relatives and friends in the local area.* Answer categories: a) Never or rarely (0 friends or rarely have contact); b) Few times (One, two or three times per month); c) Almost always (Once or two times per week); 4. Always (three or more times per week).
Social Interactions
Q.67 Using the following scale, how often would you say that the following situations occur in your neighbourhood? (Never or rarely; Few times; Sometimes; Almost always; Always). 67.1 Neighbours greet one another. 67.2 Neighbours talk to one another. 67.3 Neighbours make friendships among them. 67.4 Neighbours exchange favours. 67.5 Neighbours visit other neighbours at their homes.
Collaboration
Q. 68 Using the following scale, how often would you say that neighbours organise actions, such as the following? (Never or rarely; Few times; Sometimes; Almost always; Always). 68.1 Neighbours organise to transport in a common vehicle. 68.2 Neighbours collaborate to organise celebrations (e.g. National day). 68.3 Neighbours contribute to keep the streets and parks clean. 68.4 Neighbours contribute to monitor the local area. 68.5 Neighbours collaborate to help a neighbour when he/she needs it.

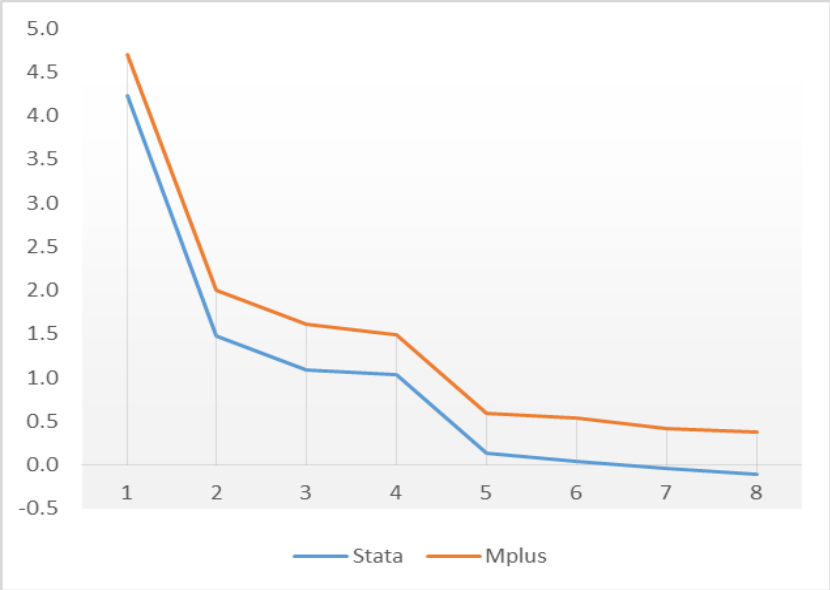
Exploratory Factor Analysis of 'Informal – community networks'

An Exploratory Factor Analysis (EFA) was used to find underlying latent factors behind the observed variables related to 'Community Feelings', 'Friendship ties', 'Social interactions' and 'Collaboration'. These measures were subsequently used to find associations between these measures with the purpose of improving understanding about the 'Community Systemic Model' (Kazarda and Janowitz, 1974), and its links with crime and violence.

In an initial estimation, using Stata, the correlation matrix reveals that four items express a low or moderate correlation ($0.1 > corr < 0.5$) with other observational variables from the same scale and from other scales: two items of 'Feelings' (26.3 and 26.5), one item of 'Social interactions' (67.5) and one item of 'Collaboration' (68.5). These items were deleted to build a more parsimonious model (see appendix 1). Next, a second EFA was produced based on this new polychoric correlation matrix.

In the second EFA, the outputs obtained from the analysis (using Mplus and Stata) show that the first four factors have an eigenvalue over 1 and explain most of the variance (the first factor explains 60% variance, the second factor 21% and the two others around 15%). According to an additional criterion, the scree plot, a small elbow is located between the second and third factor, but after that a more pronounced elbow is located between the fourth and fifth factors, which means that the fifth and subsequent factors have small eigenvalues explaining a reduced proportion of the variance (see Figure V.1). While Mplus considered all cases in the analysis, Stata only included 4,565.

Figure V. 1. EFA - Scree plot of Informal networks (eigenvalues)



The selected 4-factor model included 5,860 observations and was rotated using an oblique Geomin rotation. This oblique rotation is offered by default in Mplus, with the aim of improving the interpretation of each latent concept and allowing correlation between factors, what is expected from the theoretical definition as they cover different forms of social relations between neighbours. As observed in Table V.2, the first factor is well represented by the three observational variables related to the latent concept of 'Community Feelings towards neighbourhood' (factor loadings are equal or over 0.6). The second factor is strongly associated with the four variables of the scale of 'Social interactions among neighbours' (factor loadings are over 0.7). The third factor is dominated by the four observational variables concerning the concept of 'Collaboration among neighbours' (factor loadings over 0.7). And the last factor is represented by the two variables of 'Friendship ties'. Thus, all four factors show a clear structure and strong association with their observational items.

Table V. 2. EFA Four-factor model* of Informal networks (factor loadings)**

Variable Name	Feelings towards	Social interactions	Collabo-ration	Friendship ties
Most neighbours like living here (26.1)	0.791			
Most neighbours would not move out (26.2)	0.723			
Most neighbours are identified with history (26.4)	0.594			
Neighbours greet one another (67.1)		0.797		
Neighbours talk to one another (67.2)		0.921		
Neighbours make friends (67.3)		0.863		
Neighbours exchange favours (67.4)		0.757		
Collaborating to transport in common vehicle (68.1)			0.710	
Collaborating to organise celebrations (68.2)			0.703	
Collaborating to keep the streets/parks clean (68.3)			0.913	
Collaborating to monitor the local area (68.4)			0.826	
Density of friendship/ kinship ties (65)				0.704
Frequency of contact with friends/relatives (66)				0.991
*Model rotated with geomin option in Mplus software; **Blanks represent loadings <.3				

The correlation matrix obtained after the EFA shows that all four factors are associated, but while most correlations are low or very low, the correlation between 'Social interactions' and 'Collaboration' are moderate (see Table V.3). If some factors were strong correlated between them, they could imply a severe risk of multicollinearity in further regression models, but contrary to that, the correlations are from very low to moderate. Besides 'Social Interactions' and 'Collaboration' are more associated than 'Feelings towards neighbourhood' and 'Friendship ties'. Those associations partly support the argument which says that strong attachment towards neighbourhood and dense friendship ties is not enough to encourage the development of collaboration and informal control in local areas; mechanisms such as trust, and cohesion are required (Sampson et al., 1997).

Table V. 3. Correlation matrix of Informal networks

Factors	FN	SI	C	FT
Feelings towards N.	1			
Social interactions	0.233	1		
Collaboration	0.124	**0.454**	1	
Friendship ties	0.055	0.217	0.172	1

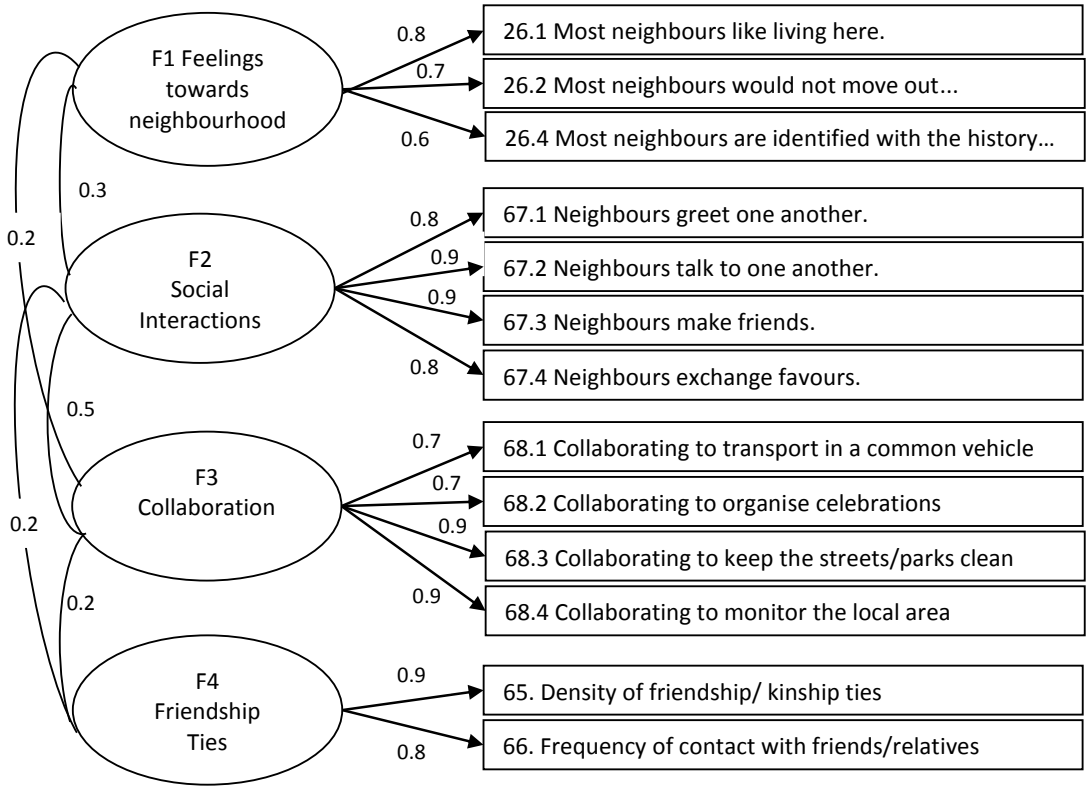
Confirming the evidence previously analysed, the goodness-of-fit statistics[99] reveal that the 4-factor model offers the best fit of the data (see Table V.4). This model has the greatest level in the Comparative Fit Index (CFI >0.96) and in the Tucker-Lewis Index (TLI >0.96), as well as the lowest level in the Standardised Root Mean Square residual (SRMR<0.08). Although this model does not meet the required level in the Root Mean Square Error (RMSEA <0.08), clearly the value of 0.09 is the lowest compared to the alternative models. In sum, the 4-factor model is the best and was selected for use.

Table V. 4. Goodness-of-fit statistics of EFA model (Mplus)

N Factors	RMSEA	CFI	TLI	SRMR
2	0.216	0.834	0.756	0.138
3	0.180	0.909	0.830	0.094
4	**0.094**	**0.981**	**0.953**	**0.022**

[99] The goodness-of-fit statistics are: the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error Approximation (RMSEA) and the Standarised Root Mean Square Residual (SRMR); according Bartholomew (2008), while the first two indicators should be over 0.96 and near 1, the last two should be lower than 0.08. See Methods and Data chapter for more details.

Figure V. 2. CFA Four-factors model (STDYX Standardisation)[100]*



After the selection of the best model to represent the community's mechanisms concerning 'Informal networks', namely the 'Community Systemic Model', based on the Exploratory Factor Analysis (EFA) framework, this model was tested and confirmed via the Confirmatory Factor Analysis. The CFA model was constructed using the same structure as the EFA model (4 factors and 13 items) and following restrictions established by default in Mplus (for a more detailed description of this see the Methods and Data Chapter). The factors represent the latent concepts of 'Feelings towards neighbourhood',

[100] *Estimators were approximately to one decimal place. Correlation between F1 and F3 was 0.16 which can be approximated to 0.2, and correlation between F1 and F4 is 0.07 which can be approximate to 0.1, the last correlation was not included in this figure.

'Social interactions', 'Collaboration among neighbours' and 'Friendship ties', and the model allows correlation among factors (see Figure V.2).

Table V. 5. Goodness-of-fit statistics of CFA model (Mplus)

N factors	Chi-square	CFI	TLI	RMSEA
4	1484.589 (sig 0.00)	0.984	0.978	0.064

As previously observed, the 4-factor model offers a good fit of the data. This model shows a satisfactory level in all goodness-of-fit statistics (see Table V.5).

After this analysis, and based on the CFA framework, factor scores were computed. The continuous variables produced in this manner were used in subsequent analysis around victimization. In the construction of these new variables all cases in the study sample (5,860) are kept with valid information concerning those variables. In other words, thanks to the use of Mplus software in this analysis, there was no missing information, which normally occurs when CFA is done with STATA (For more details about see Data and Methods Chapter, Section IV.2.3 Measurements).

Finally, the new continuous variables were standardized through z scores, having 0 mean and 1 standard deviation. Descriptive statistics of the new variables of 'Feelings towards neighborhood', 'Social interactions', 'Collaboration among neighbours' and 'Friendship ties', can be observed in Table V.16 (later in this Chapter); these are used in multilevel regression models in chapter VII.

V.2.2. Factors relative to the concept of 'Collective efficacy'

Definition of 'Collective efficacy': Social cohesion and Informal control

Sampson, Raudenbush and Earls (1997) argued that the existence of dense social bonds (friendship ties, formal and informal associational ties) in a neighbourhood can provide a fertile context for the realisation of informal control, but it is the exercise of this control and not the presence of social bonds which inhibits the occurrence of crime. The authors argued that 'Social cohesion' - defined as the presence of trust, solidarity and shared goals among neighbours - combined with 'Informal control' - defined as residents'

willingness to intervene on behalf of the common good - are the crucial ingredients in the development of community social controls (Sampson et al., 1997; Morenoff et al., 2001). Indeed, the authors replaced the term 'Social control' with the construct of 'Collective efficacy'. They believe that when residents share expectations about dealing with common problems, they gain the ability to act as a collective to fight against crime (Sampson et al., 1997).

Nevertheless, more recently other researchers have demonstrated that 'Collective efficacy' is a multidimensional concept rather than being unidimensional (Rhineberger-Dunn and Carlson, 2009), and informal networks, 'Social cohesion' and 'Informal control' exert different effects on victimization (Rhineberger-Dunn and Carlson, 2009, 2011; Triplett et al., 2005). Thus, to test the multidimensionality of the Collective efficacy concept, in the 2010 Santiago Community-Survey three different 5-point Likert scales (Trust, Unity and Informal Control) were created and examined. These measures constitute an adapted version of the original scales, proposed by Sampson et al. (1997).

Social cohesion

This construct was measured through two 5-point Likert scales relative to the concepts of 'Trust' and 'Unity or solidarity' among neighbours, having answers ranging from 'Strongly disagree' to 'Strongly agree'. The first scale asked, 'Thinking about trust in your neighbourhood, how much do you agree or disagree with the following statements?*'* and included five sentences, such as: 'The agreements between neighbours are respected' (see Table V.6). Two items on the scale were expressed in a negative sense: (1) 'It is likely that some neighbours take advantage of one'; and (3) 'Residents of this neighbourhood are unwilling to help someone who needs it.' Their polarity was reversed to be included in the EFA analysis. The second scale enquired, 'In relation to the unity within your neighbourhood, how much do you agree or disagree with the following statements? and included five items, such as: 'This neighbourhood is very united' (see Table V.5). Two items on the scale were expressed in a negative sense: (2) 'Neighbours do not share the same values'; and (4) 'There are conflicts between neighbours.' Their polarity was reversed to be included in the EFA analysis.

Table V. 6. Scales of Collective efficacy

Social cohesion: Trust
Q.84 Using the following scale, and thinking about trust in your neighbourhood, how much do you agree with the following statements? (Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree) 84.1 It is likely that some neighbours take advantage of one (polarity reversed). 84.2 If someone goes out he/she knows that neighbours will watch his/her home. 84.3 Residents of this neighbourhood are unwilling to help someone who needs it (polarity reversed). 84.4 Residents of this neighbourhood are more reliable than people from other neighbourhoods. 84.5 The agreements between neighbours are respected.
Social cohesion: Unity or solidarity
Q.85 Using the following scale, in relation to the unity in your neighbourhood, how much do you agree or disagree with the following statements? (Strongly disagree; Disagree; Neither agree nor disagree; Agree; Strongly agree) 85.1 This neighbourhood is very united. 85.2 Neighbours do not share the same values (polarity reversed). 85.3 There are communication and understanding between neighbours. 85.4 There are conflicts between neighbours (polarity reversed). 85.5 Neighbours act with solidarity and collaboration.
Informal control
Q.89 Using the following scale, in your opinion, how likely is it that your neighbours would intervene in the following situations? (Very unlikely; Unlikely; Neither unlikely nor likely, Likely, Very likely) 89.1 When children or teenagers are skipping school and hanging out on a street corner. 89.2 When a neighbour is walking drunk through the local streets. 89.3 When a fight happens in front of your home. 89.4 When a neighbour shout at or hit his child in public. 89.5 When some neighbours throw out garbage onto streets or damage public places. 89.6 When there are people consuming or selling drugs in public places. 89.7 When a stranger is attempting to steal from a neighbour.

Informal control

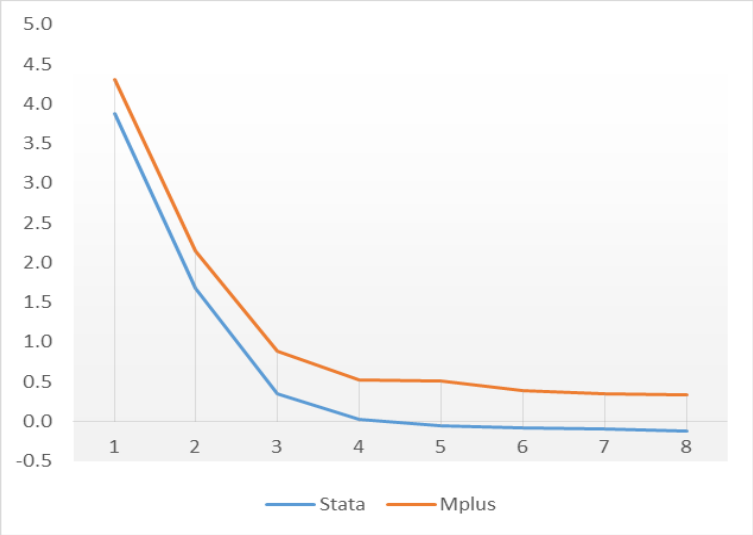
This concept was measured through a 5-point Likert scale of shared expectations for social control, with answers ranging from 'Very unlikely' to 'Very likely'. Specifically, respondents were asked about 'The likelihood that their neighbours would intervene in certain situations', such as: 'When children or teenagers are skipping school and hanging out on a street corner'; 'When a fight happens in front of your home,' among others (see Table V.6).

Exploratory Factor Analysis of the concept of 'Collective efficacy'

An Exploratory Factor Analysis was produced to test the uni- or multidimensionality of Collective efficacy, considering the variables shown in Table V.6.

In an initial EFA, using Stata, the correlation matrix reveals that two items of trust (84.1 and 84.3) and two items of unity (85.2 and 85.4) express a low or moderate correlation ($0.1 > corr < 0.5$) with other observational variables of the same scale and very low correlation with items on the other scales. These items were deleted to build a more parsimonious model. In addition, three items on the scale of 'Informal control' were deleted (89.1, 89.2 and 89.6) for two different reasons: firstly, the items presented a large number of missing cases (more than 300), which diminished the quality of results; and, secondly, they expressed a low or moderate correlation with other observational variables on the same scale and other scales (see Appendix 1). After dropping those seven problematic items, a second EFA was produced based on the new correlation matrix (5,846 observations).

Figure V. 3. EFA - Scree plot of Collective efficacy (eigenvalues)



In the second EFA, the outputs obtained from the analysis (using Mplus and Stata) show that the first two factors have an eigenvalue over 1 and explain the major part of the variance (the first factor explains 74% of the variance and the second 32%). The scree plot (see Figure V.3) reveals an important difference between the Stata line and the Mplus line. While in the Stata line there is a small elbow in the third factor, meaning that only the first two factors explain the major part of the variance, with the third and fourth factors having very low eigenvalues (0.35 and 0.02 respectively), in the Mplus line the elbow is located between the third and fourth factors, which means that the fourth and subsequent factors explain a reduced proportion of the variance (small eigenvalues). Although the evidence from Stata tends to support the election of two factors, this information could be biased because the software left more than one thousand cases out of its analysis. The analysis in Mplus only left out fourteen cases.

As observed in Table V.7, the 2-factor model and the 3-factor model were selected to be interpreted; they included 5,846 observations and were rotated using an oblique Geomin rotation.

Table V. 7. EFA - two and three factor models* of Collective efficacy (factor loadings)**

	EFA 2-factor model		EFA 3-factor model		
Variable Name	**Social cohesion**	**Informal control**	**Trust**	**Unity**	**Informal control**
Residents rely on neighbours watching his/her home (84.2)	0.641		0.515		
People of this neighbourhood are more reliable… (84.4)	0.695		0.810		
Agreements between neighbours are respected (84.5)	0.777		0.718		
This neighbourhood is very united (85.1)	0.720			0.718	
There are communication and understanding… (85.3)	0.803			0.978	
Neighbours act with solidarity and collaboration (85.5)	0.724			0.711	
Neighbours intervene: when people fight in the street (89.3)		0.806			0.821
…when a neighbour shouts at or hits his child in public (89.4)		0.862			0.882
…when people throw out garbage onto streets (89.5)		0.822			0.835
…when a stranger attempts to steal from a neighbour (89.7)		0.708			0.722
*Model rotated with geomin option in Mplus software; **Blanks represent loadings <.3					

The 3-factor model has a very clear structure, with three different factors and all observational items strongly associated with one of these factors. The first factor is correlated with three observational variables concerning the concept of 'Trust' (two high factor loadings and one moderate loading). The second factor is dominated by the three variables on the scale of 'Cohesion' (high factor loadings over 0.7). The third factor is strongly associated with the four observational variables related to the concept of 'Informal control' or neighbours' willingness to intervene in community issues (high factor loadings over 0.7). On the other hand, the correlation matrix (see Table V.8) shows that while correlations between trust and cohesion are high (near 0.7), association between informal control and the two other scales are moderate (corr. < 0.4). In addition, according to the goodness-of-fit statistics (Table V.9), the 3-factor model offers the best fit of the data: the greatest level in CFI (>0.96), the lowest levels in the RMSEA (<0.06) and in the SRMR (<0.06).

Table V. 8. Correlation matrix of 3-factor model (Mplus)

Factors	Trust	Unity	Informal Control
Trust	1		
Unity	**0.683**	1	
Informal control	0.370	0.348	1

The 2-factor model has a consistent structure with two clear factors and high loadings in each factor. While the first factor is populated by the six observational variables concerning the concept of 'Social cohesion' (five high factor loadings over 0.7 and one moderate around 0.6), the second factor is dominated by four observational variables relative to the concept of 'Informal control' (all loadings are high over 0.7). Both factors are moderately correlated (0.4). Although this model does not present a good fit with the data (see Table V.9) - in fact only meeting the SRMR criteria (<0.06) - the structure of the model is consistent with a large amount of literature which highlights the existence of two related but independent concepts: 'Social cohesion' and 'Informal control', which can be associated with violent crime in different ways (e.g. Rhineberger-Dunn and Carlson 2009, 2011; Triplett et al., 2005).

Table V.9. Goodness-of-fit statistics of EFA models (Mplus)

N Factors	RMSEA	CFI	TLI	SRMR
1	0.261	0.754	0.683	0.184
2	0.148	0.941	0.899	0.046
3	**0.059**	**0.994**	**0.984**	**0.014**

In sum, based on the previous evidence, it is possible to conclude that the 3-factor model is the best-fitting model. It is composed of three distinct factors: 'Trust', 'Unity' and 'Informal control'. This fact demonstrated that a one-dimensional construct called 'Collective efficacy' may miss important aspects of different concepts; rather, there are three different concepts, which can (or cannot) be associated with crime and violence in

neighbourhoods. Nonetheless, the strong correlation expressed between 'Trust' and 'Unity' (0.7) may imply a severe risk of multicollinearity in regression models - a topic that will be evaluated in the next section. Considering the risk of multicollinearity, two different models were produced through CFA: a three-factor model and a two-factor model, which are presented in the next section.

Confirmatory Factor Analysis of Social cohesion and Informal control

In order to deal with potential multicollinearity problems in regression models, and to test the two alternative solutions previously found through the EFA framework, two different Confirmatory Factor Analyses (CFA) were estimated, incorporating the ten observational variables associated with the latent concepts of 'Social cohesion' ('Trust' and 'Unity') and 'Informal control'. The CFA models, observed in Figures V.4 and V.5, are constructed using the same structure as the EFA models, following restrictions established by default in Mplus (for a more detailed description of this see the Methods and Data Chapter) and allowing correlation among the factors.

The **three-factor model** (see Figure V.4), where the first factor corresponds to the concept of 'Trust' (composed by three variables), the second factor to the concept of 'Unity' (composed by three variables), and the third factor to the concept of 'Informal control'. The goodness-of-fit statistics obtained from this model confirmed that this solution is the best-fitting (see Table V.8).

In the **two-factor model** (see Figure V.5), the first factor corresponds to the concept of 'Social cohesion' and the second factor is related to the concept of 'Informal control'. Based on the previous outputs, 'trust' and unity' was highly correlated, and for that, they can be connected in a unique construct of 'Social Cohesion'. Thus, this solution offers a reasonably good fit of data, according to the CFI indicator (CFI >0.96) (see Table V.8). But overall, this finding is consistent with evidence from previous studies, across different contexts (Sampson et al 1997, Mazerole et al 2010, Sampson 2012), so it can be argued that this model is theoretically supported.

Figure V. 4. CFA three-factors model (STDYX Standardisation)[101]

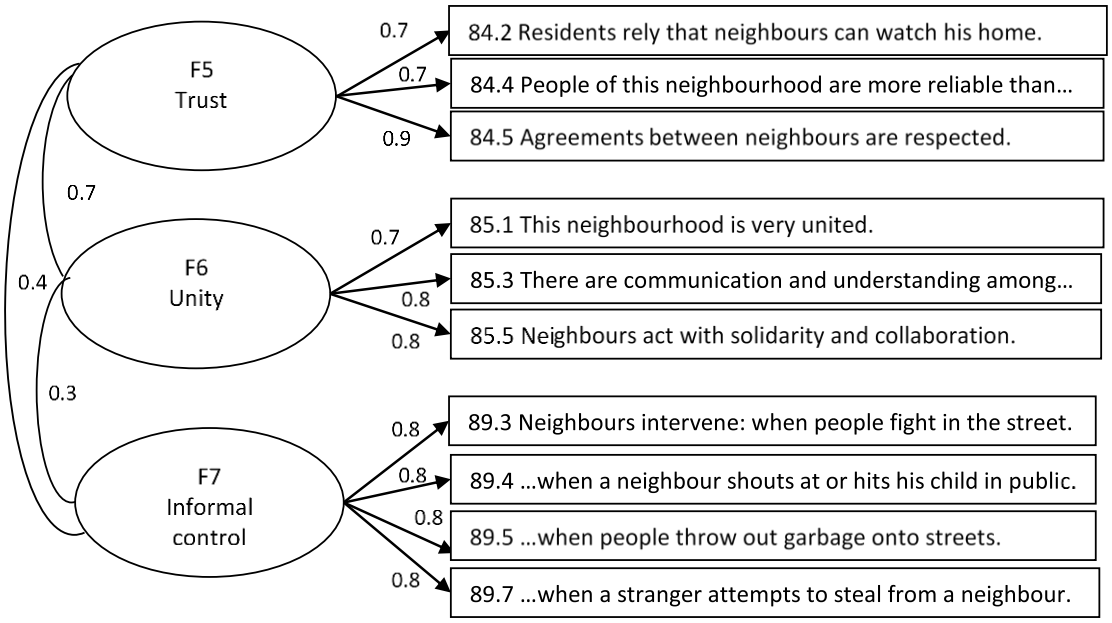
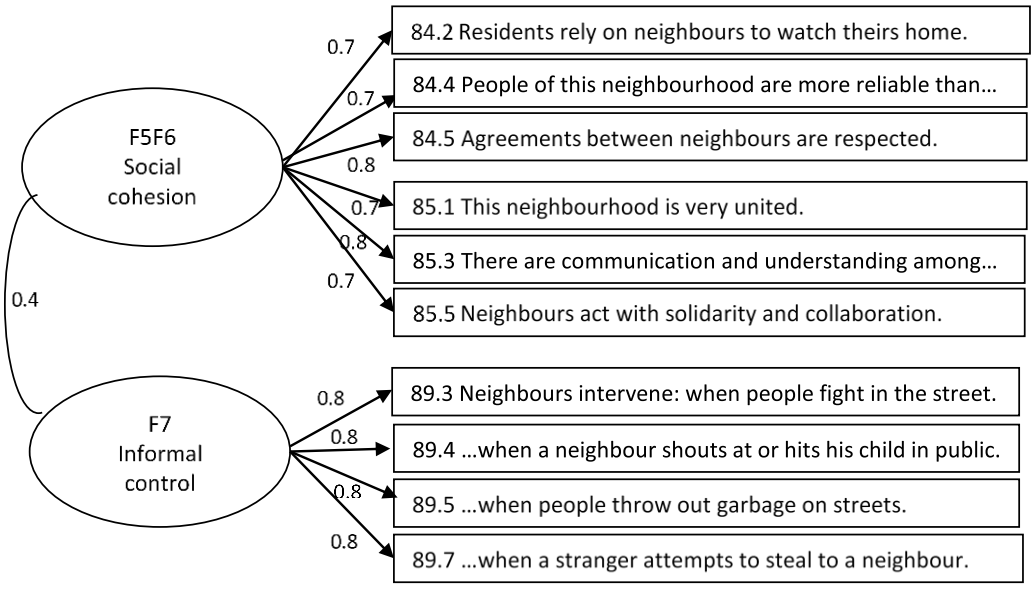


Figure V. 5. CFA two-factors model (STDYX Standardisation)[102]



[101] Estimators were approximately to one decimal place.

[102] Estimators were approximately to one decimal place.

As with the EFA results, the 3-factor model offers a better fit of the data than the 2-factor model. Nonetheless, according the Chi-square test and CFI test (see Table V.10), the goodness-of-fit statistics of the 2-factor model also meet the required criteria to be used as a factorial solution to represent the data.

Beyond the final decision of the 'best model' that should be selected is relevant to highlight that in the two models analysed, the correlation between 'Social Cohesion' and 'Informal Control' was modest (between 0.3 and 0.4), and clearly much lower than the evidence that Sampson and colleagues have expressed. Therefore, in the line with the argument exposed in the theoretical chapter, findings presented here suggest that 'Collective Efficacy' only can be considered as a 'theoretical' multidimensional construct rather than an 'empirically probed' single-latent concept. These ideas confirm the criticism made by Hipp and Wo (2015) and Rhineberger-Dunn and Carlson (2011), regarding the diffuse definition and measurement of the 'Collective Efficacy' concept, and also confirm evidence showed by previous studies (e.g. Rhineberger-Dunn and Carlson 2009, 2011; Renauer 2007; Warner 2007, Triplett et al, 2005).

Table V.10. Goodness-of-fit statistics of CFA model (Mplus)

N factors	Chi-Square	CFI	TLI	RMSEA
2	2286.745 (sig. 0.00)	0.960	0.947	0.106
3	900.088 (sig. 0.00)	0.985	0.978	0.068

After applying those two CFA models, factor scores were computed, and four new variables were obtained: 'Trust', 'Unity', 'Social cohesion' and 'Informal control'. These new continuous variables were standardized through z scores, having 0 mean and 1 standard deviation (see Table V.16). After that, these new variables were used in a multicollinearity analysis, described in the next section, in order to decide which variables can be introduced into multilevel regression models (Chapter VII). In the construction process of these new variables, only fourteen cases are missing, so most cases in the study sample (5,846) are kept with valid information.

V.2.3. Factors relative to the concept of 'Public control'

Definition of 'Public control'

Studies of the ecological distribution and potential causes of crime commonly measure the influence of public or formal control using measures of 'Police satisfaction' (e.g. Silver and Miller, 2004). However, these kinds of measures often include two different dimensions: perceptions of direct measures of formal control (the function of formal agencies in maintaining order and preventing crime), and police-community relations (how well police respond to local problems or demands) - as Rhineberger-Dunn and Carlson (2009) observed through a confirmatory factorial analysis.

Following the definition of 'Public social control' created by Bursik and Grasmick (1993), as the community ability to secure external resources necessary for the reduction of crime, Velez (2001) measures residents' satisfaction with their local government and police using four questions: 'Is the local government concerned about your neighbourhood?'; 'Can a person get satisfaction out of talking to the public officials in your community?'; 'Do you think that your police department tries to provide the kind of services that people in your neighbourhood want?'; and 'How would you rate the overall quality of police services in your neighbourhood?'

Perceptions of police response and local government performance

In the Santiago survey residents' satisfaction with police was measured through a proxy, the likelihood that the two police forces, the Carabineros de Chile and the Policia de Investigaciones[103], would respond to a neighbour's call and go to the place as soon as possible, with answers ranging from 'Very unlikely' to 'Very likely'. Regarding local government, the survey included a scale which measured the residents' perceptions of the quality of different services offered by the municipality to the local neighbourhoods, with answers ranging from 'Very bad' to 'Very good'. The services measures are: Maintenance of public areas; Availability of leisure, sports and cultural centres;

[103] In Chile there are two national police forces: Carabineros de Chile (preventive and uniformed police) and Policía de Investigaciones (investigative police).

Maintenance of urban infrastructure and Promotion of citizen security measures (see Table V.11). Two items which measure functions not associated with crime prevention or conservation of public places were deleted.

Table V.11. Scales of Public control

Perceptions of police response
Q31. If you or someone in the neighbourhood requests some of the following services, how likely do you think they are to go to the place? (Very unlikely; Unlikely; Neither unlikely nor likely; Likely; Very likely) 31.2 Carabineros de Chile 31.3 Policía de Investigaciones de Chile
Perceptions of municipality services
Q.49 Using the following scale, and based on your experience or your neighbours' experience, how do you assess the following services commonly offered by the municipality to local neighbourhoods? (Very bad; Bad; Regular; Good; Very good) 49.1 Maintenance and cleaning of public areas (streets, squares and parks). 49.2 Availability and maintenance of leisure, sports and cultural centres. 49.5 Maintenance of urban and road infrastructure. 49.6 Promotion of citizen security measures.
Police-community nexus
Q.54 If you or someone in your household requires any police service, from Carabineros de Chile, do you know the police station or guard station that serves in your neighbourhood? (Yes / No) *Q.55 If you or someone in your household requires any police service, from Policía de Investigaciones, do you know the police station or guard station that serves in your neighbourhood?* (Yes / No) *Q.65 In the context of the 'Preventive plan' of Carabineros de Chile, Do you know how to make contact with a police officer assigned to your neighbourhood?* (Yes /No) *Q.66 Based on your experience or what you have heard from your neighbours, have meetings between police and community leaders ever been carried out in your neighbourhood?* (Yes / No)

Police-community nexus

As in the community survey, enquiries about 'how well the police are involved in local issues' or 'whether or not the police maintain permanent contact with the community' were not included. Four questions asking for residents' knowledge' of the 'Police-community nexus' were put: 1. The location of the local police station of 'Carabineros de Chile' (preventive police); 2. The location of the local police station of 'Policía de Investigaciones' (investigative police); 3. How to make contact with a police officer assigned to their local area or neighbourhood; and 4. Whether or not meetings between police and community leaders have ever been carried out in the neighbourhoods (see Table V.11).

Exploratory Factor Analysis of 'Public control' concept

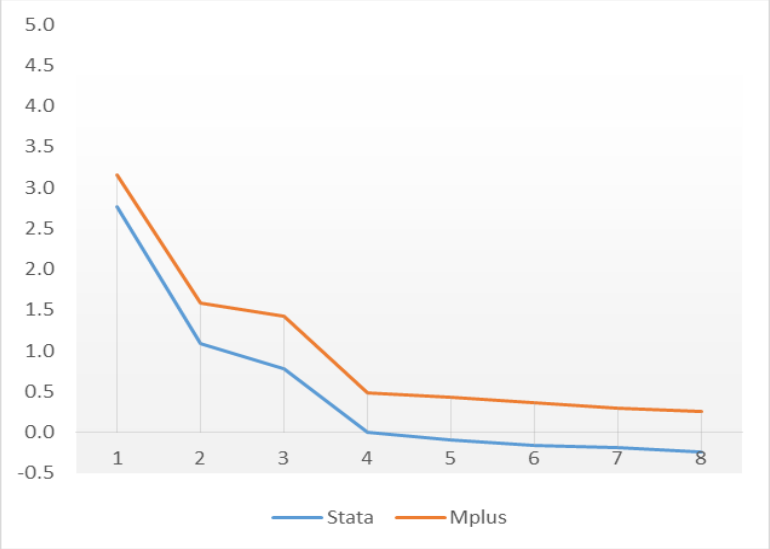
In an initial estimation, using Stata, the polychoric correlation matrix shows that the two items of 'Perceptions of police' are strongly associated between them (0.75). In a similar way, the four items of 'Perceptions of municipality services' are strongly correlated between them (0.6 > corr < 0.7). On the other hand, the four items of 'Police-community nexus' are low or moderately associated between them (0.2 > corr < 0.5), and they present confused trends in their association with items from the other factors. As items 3[104] and 4[105] are moderately correlated between them (0.55) and they express clearly the link that exists between police and community, they were kept in the EFA. Items 1[106] and 2[107] were excluded from further analysis (see Appendix 1).

In a factor analysis, testing the same models through Stata and Mplus, the Mplus output shows that the first three factors have an eigenvalue over 1 and explain the majority the variance (the first factor explains 70% of the variance, the second 27% and the third 19%). Stata results, in contrast, reveal that only the first two factors have an eigenvalue over 1. Trends observed in the scree plot (see Figure V.6) reveal that in the Mplus and

[104] Item 3 is: How to make contact with a police officer assigned to their local area or neighbourhood.
[105] Item 4 is: Whether or not meetings between police and community leaders have ever been carried out in the neighbourhoods
[106] Item 1 is: The location of the local police station of 'Carabineros de Chile' (preventive police).
[107] The location of the local police station of 'Policía de Investigaciones' (investigative police).

Stata lines, there is an elbow between the second and third factors, but after that there is also another elbow between the third and fourth factors, particularly pronounced in the Mplus line. This means that the fourth and subsequent factors have small eigenvalues, explaining a reduced proportion of the variance. As the estimation of Mplus considers all data samples (5,860 cases), whereas the Stata only includes 4,890 cases, the final decision was taken based on the Mplus analysis and three factors were selected.

Figure V. 6. EFA - Scree plot of Public control (eigenvalues)



As shown in Table V.12, the three-factor model was selected. This was rotated using an oblique Geomin rotation and included 5,860 observations. In the model, the first factor is represented by the two observational variables concerning the concept of 'Perceptions of police response' (with high factor loadings over 0.8). The second factor is strongly associated with the four variables on the scale of 'Perceptions of municipality services' (with factor loadings over 0.75). The third factor is dominated by the two observational variables concerning the concept of 'Police-community nexus' or residents' knowledge of police proximity to their community (high factor loadings over 0.7). In synthesis, the selected model has a clear structure of three factors where each factor shows a strong association with its observational items.

Regarding the correlation among factors, the correlation matrix (Table V.13) shows that perceptions of the two different forms of public control (by the police and by the municipality/local government) are only weakly associated (0.3), which refutes findings of previous studies where the concept of Public control grouped the action of different public agencies together. However, it is relevant to notice that in this study the scale used to measure 'Perceptions of police' is only a proxy, because it did not include a direct question about the community's assessment of police services and functions. Thus, this measure is not comparable with the scale of 'Perceptions of municipality', where there was a direct call for evaluating the municipality services. In a similar way, the association between 'Perceptions of police' and 'Police-community nexus' is very low (0.16), which confirms that these are different modes of approach to police work at the local level. However, those findings should be confirmed in further studies using more accurate measures for the two concepts.

Table V. 12. EFA - three factor models* of Public control (factor loadings)**

Variable Name	Perception of police	Perception of municipality	Police- community nexus
Likelihood of preventive police response (31.2)	0.859		
Likelihood of investigative police response (31.3)	0.870		
Maintenance and cleaning of public areas (49.1)		0.781	
Availability and maintenance of leisure, sports and cultural centres (49.2)		0.795	
Maintenance of urban infrastructure (49.5)		0.824	
Promotion of citizen security measures (49.6)		0.766	
Knowledge of the police officer assigned to the neighbourhood (police3)			0.728
Meetings between police and community have been carried out (police4)			0.748
*Model rotated with geomin option in Mplus software; **Blanks represent loadings <.3			

The goodness-of-fit statistics, observed in Table V.14, reveal that the 3-factor model offers the best fit of the data. This model has the greatest level in the Comparative Fit Index (CFI >0.96) and the lowest level in the absolute standardised residual (SRMR<0.08). Although the model does not meet the expected level in the 'Root Mean

Square Error' (RMSEA <0.08), it shows the best approximation. In sum, the 3-factor model is the best one to represent the latent concepts of 'Perceptions of police', 'Perceptions of municipality services' and 'Police-community nexus'.

Table V. 13. Correlation matrix of 3-factor model (Mplus)

N factors	P. police	P. municipality	P-C nexus
Perceptions of police	1.00		
Perceptions of municipality	0.30	1.00	
Police-community nexus	0.16	0.19	1.00

Table V. 14. Goodness-of-fit statistics of EFA models (Mplus)

N Factors	RMSEA	CFI	TLI	SRMR
1	0.251	0.801	0.754	0.183
2	0.175	0.937	0.941	0.091
3	**0.099**	**0.989**	**0.984**	**0.018**

Confirmatory Factor Analysis of Social cohesion and Informal control

After the selection of the best model to represent 'Public control' mechanisms, based on the Exploratory Factor Analysis (EFA) framework, this model was tested and confirmed via the Confirmatory Factor Analysis. The CFA models are constructed using the same structure as the EFA model (3 factors and 8 items) and following restrictions established by default in Mplus (for a more detailed description of this see the Methods and Data chapter). The factors represent the latent concepts of 'Perceptions of police', 'Perceptions of municipality services' and 'Police-community nexus', and the model allows correlation between factors (see Figure V.7). As previously observed, the 3-factor model offers a good fit of the data. This model shows a satisfactory level in all goodness-of-fit statistics (Table V.15).

After getting those two CFA models, factor scores were computed, and three new variables were obtained: 'Perceptions of police', 'Perceptions of municipality services' and 'Police-community nexus'. These new continuous variables were standardized

through z scores, having 0 mean and 1 standard deviation. Descriptive statistics of the new variables can be observed in Table V.16[108]. After that, these variables were tested through multicollinearity analysis in order to decide which variables could be introduced into multilevel regression models (Chapter VII). In the construction process of these new variables, all cases in the study sample (5,860) are kept (no cases are missing with regards to the new variables).

Figure V. 7. CFA three-factors model (STDYX Standardisation)[109]*

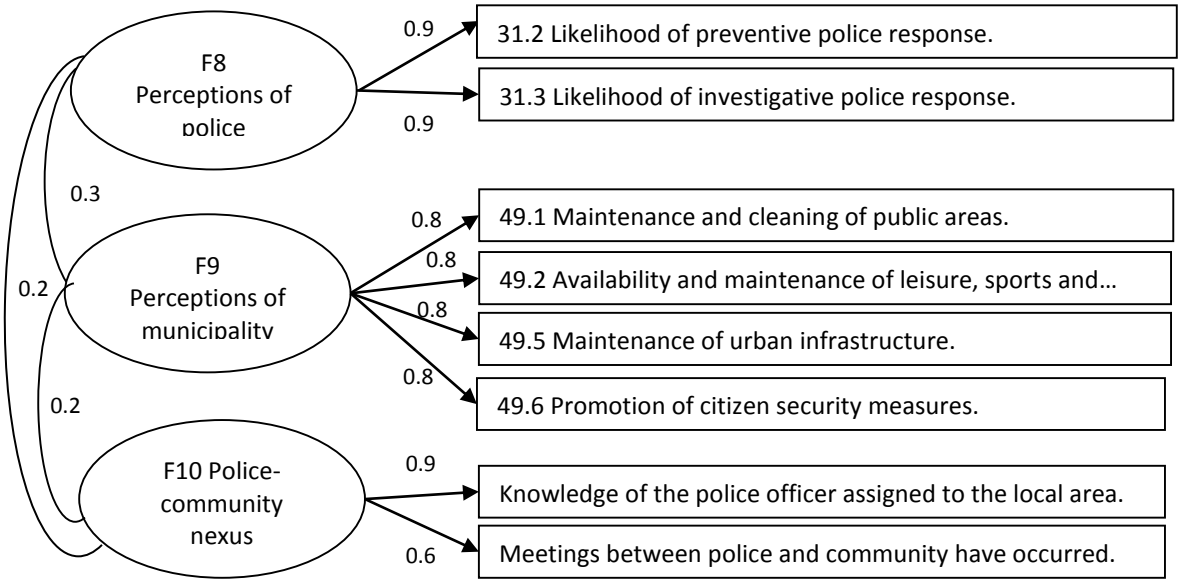


Table V. 15. Goodness-of-fit statistics of CFA model (Mplus)

N factors	Chi-Square	CFI	TLI	RMSEA
3	298.421 (0.00)	0.992	0.987	0.053

[108] The variables within factors 1, 2, 3, 5, 6, 7, 8 and 9 were scales from 1 to 5, so the range width maintained similar. Instead, the variables within factor 4 were a scale from 1 to 4, and the variables within factor 10 were dichotomic.

[109] Estimators were approximately to one decimal place.

Table V. 16. Descriptive statistics of Factor scores variables – individual level

Independent - Predictor variables	Valid cases	Mean	St. deviation	Minimum	Maximum
Feelings toward neighbourhood (f1)	5860	.000	1.000	-3.29	2.21
Social interactions (f2)	5860	.000	1.000	-3.17	2.06
Collaboration (f3)	5860	.000	1.000	-2.16	2.67
Friendship ties (f4)	5860	.000	1.000	-1.78	1.78
Trust (f5)	5846	.000	1.000	-3.36	2.79
Unity (f6)	5846	.000	1.000	-3.24	2.74
Social cohesion (f5f6)	5846	.000	1.000	-3.49	2.94
Informal control (f7)	5846	.000	1.000	-2.36	2.51
Perceptions of police (f8)	5860	.000	1.000	-2.85	1.52
Perceptions of municipality (f9)	5860	.000	1.000	-2.64	2.82
Police-community nexus (f10)	5860	.000	1.000	-1.40	4.48

V.3. Multicollinearity Diagnosis

V.3.1. Multicollinearity diagnosis on factor variables

Before producing regression models, a multicollinearity diagnosis was conducted to find potential collinearity between the recently created explanatory factors. To do that, two different analyses were produced: a correlation analysis based on the correlation matrix, and a linear regression model which included the VIF test (Variance Inflator Factor); both outputs are exposed and interpreted below.

The correlation matrix (Table V.17) reveals that while most variables are lowly associated (0.1 > corr < 0.4), another group of variables are correlated on a moderate level (0.4 > corr < 0.6). For instance, 'Feelings towards neighbourhoods' correlates with 'Social interactions' (~0.4), with 'Trust' (~0.4) and with 'Unity' (0.4). Correlations between 'Collaboration' and 'Social interactions' (0.6), and between 'Trust' and 'Unity' are strong (0.8); both associations should be addressed with caution.

Although some researchers only consider collinearity as a problem when correlations among variables are very strong (over 0.9) (e.g. Agresti & Finlay, 2014), Grewal, Cote & Baumgartner (2004) asserted that there is no general consensus about the cut-off point, nor about the effects of multicollinearity in complex regression models, such as multilevel or SEM models. The authors suggested that when multicollinearity is extreme (over 0.9) Type II error rates are generally high (over 80%). But when multicollinearity is between 0.6 and 0.8, Type II error can be also substantial (greater than 50%, and sometimes above 80%), particularly when composite reliability is weak (0.7 or lower), explained variance is low (R^2 < 0.25) or sample size is small (Grewal, Cote & Baumgartner, 2004: 526-7). In the present study, despite the majority of the latent constructs being highly reliable (alpha over 0.7)[110] and sample size large (N=5,860), the explained variance of the dependent variables is low in the majority of tested models.

[110] Reliability of the scales according Cronbach's Alpha is: 'Sentiments towards neighbourhood' (0.70), 'Social interactions' (0.88), 'Collaboration' (0.83), 'Friendship ties' (0.78), 'Social cohesion' (0.83), 'Informal control' (0.86), 'Perceptions of police' (0.78) and 'Perceptions of municipality services' (0.84).

Thus, correlations between 0.6 and 0.8 should be managed with caution because, as Grewal, Cote & Baumgartner (2004) explained, high collinearity can have effects on estimators and measurement errors. Thus, only one correlation is close to these level, between 'Trust and Unity'.

Table V. 17. Correlations matrix between explicative factors obtained via CFA

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
Sentiments towards community (f1)	1									
Social interactions (f2)	**0.36**	1								
Collaboration (f3)	0.21	**0.56**	1							
Friendship ties (f4)	0.10	0.29	0.26	1						
Trust (f5)	**0.37**	**0.43**	**0.36**	0.22	1					
Unity (f6)	**0.40**	**0.51**	**0.43**	0.25	**0.84**	1				
Informal control (f7)	0.17	0.18	0.20	0.14	**0.42**	**0.39**	1			
P. police (f8)	0.20	0.07	0.08	0.00	0.09	0.08	0.06	1		
P. municipality (f9)	0.28	0.13	0.21	0.07	0.21	0.20	0.14	**0.36**	1	
Police-community (f10)	0.04	0.07	0.21	0.09	0.07	0.07	0.07	0.21	0.22	1

In order to confirm the multicollinearity risk between the explicative factors two linear regression models[111] were computed, and then the Variance Inflator Factor (VIF) was estimated (see Table V.18, M1 and M2). In the linear regression models a count variable of household victimization by violent crimes was used as the dependent variable, and social and organisational factors were introduced as explicative variables. The VIF expresses how much of the proportion of the variance of one variable is explained by its association with other independent variable in the model, through the formula: 1/(1-R2). Williams (2015)[112] stated that the common rule of thumb is that VIFs of 10 or higher (or equivalently, tolerances of .10 or less) may be reason for concern. Nonetheless, Agresti & Finlay (2014) suggested that a VIF over 4 revealed a risk of multicollinearity, and Allison

[111] Although the models produced in the next chapters are logistic models (single level and multilevel), the VIF diagnosis cannot be estimated in those kinds of models. For that reason the multicollinearity test was made under a 'regression linear model'.

[112] https://www3.nd.edu/~rwilliam/stats2/l11.pdf

(2012)[113] argued that when the VIF is over 2.5 and the tolerance is under .40, one should be concerned.

As observed in the Multicollinearity diagnosis (Table V.18, M1), the recently created variables of 'Trust' (F5) and 'Unity' (F6) express values in the VIF indicator close to 4, unlike the variables of 'Social interactions' (F2) and 'Collaboration' (F3), which have regular VIF values (less than 2). Thus, this finding confirms that there is a problem of collinearity between 'Trust' and 'Unity', but not in respect of 'Social interactions' and 'Collaboration'.

Table V. 18. Multicollinearity diagnosis based on Linear Regression models and VIF

Regression Model 1 (M1)			Regression Model 2 (M2)		
Variable	VIF	1/VIF	Variable	VIF	1/VIF
Trust (f5)	**3.9**	0.26			
Unity (f6)	**3.6**	0.28	Social interactions (f2)	1.8	0.56
Social interactions (f2)	1.8	0.56	Social cohesion (f5f6)	1.7	0.57
Collaboration (f3)	1.6	0.61	Collaboration (f3)	1.6	0.61
Feelings toward N. (f1)	1.3	0.75	Feelings toward N. (f1)	1.3	0.75
Perceptions of municipality (f9)	1.3	0.78	Perceptions of municipality (f9)	1.3	0.78
Informal control (f7)	1.2	0.81	Informal control (f7)	1.2	0.81
Perceptions of police (f8)	1.2	0.84	Perceptions of police (f8)	1.2	0.84
Friendship ties (f4)	1.1	0.89	Friendship ties (f4)	1.1	0.89
Police-community nexus (f10)	1.1	0.90	Police-community nexus (f10)	1.1	0.90
Mean VIF	**1.82**		**Mean VIF**	**1.38**	

In order to solve the problem of collinearity another regression model was produced (Table V.18, M2). In this model the same dependent variables and explanatory variables were introduced, except that the variables of 'Trust' and 'Unity' (f5 and f6) were replaced by the factor of 'Social cohesion' (f5f6). Although the previous analyses (EFA and CFA)

[113] https://statisticalhorizons.com/multicollinearity

suggested that the 3-factor model was the best-fitting, the 2-factor model was also a satisfactory model and theoretically supported use of the latent variable of 'Social cohesion' (f5f6) instead of the variables of 'Trust' (f5) and 'Unity' (f6) in the M2. The VIF diagnosis of the M2 demonstrated that there is no multicollinearity risk among the nine explicative factors, so those factors will be used in furthers regression models.

V.3.2. Multicollinearity diagnosis on control variables

In a second step, another multicollinearity diagnosis was carried out in order to find potential risks of collinearity between independent control variables. Because all those variables were categorical, the diagnosis was produced through a different approach: firstly, a spearman correlation was estimated, and, secondly, a linear regression model of the count variable of 'Household victimization by violent crime' was produced, and the control variables were introduced via a set of dummies (leaving behind the reference variable). After that the VIF test was estimated.

Table V. 19. Spearman correlation between independent - control variables

Variables	Education level H.H.	Main Activity	Working position	New family Income	
Education level H.H.	1				
Main activity	-0.24**	1			
Working position	-0.18**	**0.86****	1		
New family Income	**0.45****	-0.30**	-0.23**	1	
Income dependency	-0.09**	0.17**	0.17**	-0.06**	1
** p < 0.01, *p < 0.05, all correlations are significant at 0.01 level.					

The Spearman correlation analysis (Table V.19) expressed that most variables are little associated (0.1 > corr < 0.4), but the correlation between 'Education level of the household head' and 'New family income' is moderate (0.4 > corr < 0.6). Only the correlation between 'Main activity of the household head' and 'Working position' is very strong (0.86). The severe correlation is because the second variable was derived from the first in their construction, and then it became evident that both variables should not be included at the same time in any regression model.

Confirming the correlation analysis, Table V.20 suggests that there is a severe collinearity between ‘Main activity of the household head’ and ‘Working position’ (VIF over 10). Thus, each of these variables was tested separately in regression models in order to find which of them are most associated with the dependent variable of ‘Violent victimization’, in the next chapter (VI). Regarding the variable ‘New family income’, this also expressed a severe risk of collinearity with another independent variable, ‘Education level of the household head’, according to the VIF indicator. However, in this case, as the previous spearman correlation between both variables was not very strong both variables were tested in logistic regression models in chapter VI, and after that a decision would be taken in order to choose one of them for further multilevel regression models.

Table V. 20. Multicollinearity diagnosis based on Linear Regression Models and VIF

	M1		M2	
Variables	**VIF**	**1/VIF**	**VIF**	**1/VIF**
Female household head (yes)	1.07	0.93	1.07	0.94
Presence of child at home (yes)	1.80	0.56	1.78	0.56
Child's out school (yes)	1.11	0.90	1.11	0.90
Education level of household head (ref. higher education)				
Secondary education	1.48	0.68	2.80	0.36
Higher education	1.86	0.54	2.59	0.39
Main activity of the household head (ref. inactive)				
Occupied	**1291.12**	0.00	-	-
Unemployed	1.34	0.74	-	-
Retired	3.24	0.31	-	-
Working position of household head (ref. inactive)				
Manager	**591.95**	0.00	1.38	0.72
Self-employee	**828.16**	0.00	1.41	0.71
Employee	**1293.76**	0.00	1.79	0.56
Unemployed*	**-**	-	1.09	0.92
New family income (ref. $1961 or more*)*				
0 - US $490	**9.83**	0.10	**9.82**	0.10
$491 – 784	**9.38**	0.11	**9.38**	0.11
$785 – 1177	**4.75**	0.21	**4.75**	0.21
$1178 – 1960	2.82	0.35	**2.82**	0.35
Level of income dependency (ref. very low)				
High level	2.54	0.39	2.53	0.40
Medium level	2.03	0.49	2.03	0.49
Low level	1.67	0.60	1.67	0.60
Unstable family house (yes)	1.07	0.93	1.07	0.93
Overcrowded family house (yes)	1.13	0.89	1.13	0.89
Length of residence (ref. very high)				
Low (0 - 5.5 years)	1.75	0.57	1.74	0.58
Medium (6 - 19.5 years)	1.79	0.56	1.78	0.56
High (20 - 35.5 years)	1.62	0.62	1.61	0.62
Mean VIF	**176.4**		**2.64**	

* The category of unemployed (4) was automatically omitted from the regression model 1 due to severe collinearity with other variables in the model.

V.4. Conclusions

This chapter set out to define the key independent (or predictor) variables to be used in single-level and multilevel regressions models in this study. Considering that most of the theoretical concepts in this study were measured through categorical variables (perception scales and/or multiple-choice questions), and to identify latent constructs underlying these observational variables, Exploratory Factor Analysis (EFA) was applied. As said in the Data and Methods Chapter, this technique allows to identify structures behind of a set of items or factors that represent latent concepts. The EFA estimation also allows us to obtain a correlation matrix to be constructed which measures the level of association between latent factors.

Subsequent to EFA estimation, goodness-of-fit statistics in EFA were computed with the aim of finding the best representation of the data for each latent concept and its associated observational variables. Then, the selected factor model was replicated under a CFA framework to obtain factor scores, to be used as continuous variables in further analysis. After that, the new continuous variables were examined through a multicollinearity diagnosis using two statistics tools: a correlation matrix and a VIF test within linear regression models. The latent factors obtained via EFA and CFA are summarised below.

Informal networks or social mechanisms

Findings from the EFA produced four social mechanisms: 'Feelings towards neighbourhood', 'Friendship ties', 'Social interactions' and 'Collaboration among neighbours', which in the social disorganization literature were defined as components of the 'systemic model of community', and in this analysis resulted as four clearly distinguishable latent factors. Each factor, in turn, is dominated by observational variables with moderate or high factor loadings. Posterior correlation analysis shows that all four factors are associated. However, while some correlations are low or very low (for instance, 'Feelings towards neighbourhood' with 'Friendship ties' and with 'Collaboration'), the association between 'Social interactions' and 'Collaboration' is moderate (~0.6). Those findings demonstrate that although the different kinds of 'Informal

networks' or 'Present within a local neighbourhood' can be associated, they are in essence independent social mechanisms or attributes; namely, they do not make part of a single and unidimensional construct. Thus, each of these attributes can express different types of association (regarding direction and strength) with violent and property victimization – which are analysed in the next chapters.

Regarding the multicollinearity diagnoses, the strong correlation between 'Social interactions' and 'Collaboration' should be carefully examined. Although most statisticians only consider correlations over 0.9 as a severe problem of collinearity, other scholars have argued that correlations between 0.6 and 0.8 can also have effects in estimators and measurement errors, particularly in the framework of complex regression models. Thus, the association between 'Social interactions' and 'Collaboration' will be managed with caution within the multilevel models, in the next chapters.

Social cohesion and Informal control

In the literature, 'Collective efficacy' has been defined as a single construct shaped by trust, unity or solidarity and informal control exerted by residents within a community. Nevertheless, several international studies have demonstrated that the latent concept of 'Collective efficacy' is linked to different and separate organisational mechanisms, so it is a multidimensional concept rather than a unidimensional one. The best-fitting model from the EFA revealed that there are at least three distinguishable latent concepts under the observational variables tested: 'Trust', 'Unity' and 'Informal control'. Each of these factors are, in turn, shaped by observational variables with high loadings. However, as the factors of 'Trust' and 'Unity' were strongly associated (around 0.7 in EFA) and, as a consequence, the risk of multicollinearity was significant, the 2-factor model as well as the 3-factor model were both estimated via CFA. Both models expressed acceptable goodness-of-fit statistics. Then, from these two CFA models four continuous variables were obtained: 'Trust', 'Unity', 'Social cohesion', and 'Informal control', and these variables were exposed to a multicollinearity diagnosis.

The multicollinearity diagnosis confirmed the fact that 'Trust' and 'Unity' are strongly correlated (corr. of 0.8 in correlation matrix) and, as a result, they may present a severe problem of collinearity within the estimated linear regression models of victimization counts (VIF values near 4). For that reason, the factor of 'Social cohesion' ('Trust' plus 'unity') will be used in further single-level or multilevel regression models, in the next chapters. Despite the fact that 'Social cohesion' can be seen as a single construct, 'Social cohesion' and 'Informal control' are clearly independent factors, which are only moderately correlated (0.4); and then, they do not make part of a unidimensional construct of 'Collective efficacy'. This finding is consistent with the criticism made by Hipp and Wo (2015) and Rhineberger-Dunn and Carlson (2011), concerning the inaccuracy of the definition and measurement of this concept.

As the theoretical hypothesis of 'Collective efficacy' was therefore refuted, it is expected that these two attributes have different associations or effects on violent and property victimization, which also have been demonstrated in the international literature (Sutherland, 2013; Bruinsma, 2013; Rhineberger-Dunn and Carlson 2011). Ideas that will be analysed in the next chapters.

Perceptions of police, municipality services and Police-community nexus

Findings from the EFA revealed that the two measures which represent the assessment of 'Public control' institutions: 'Perceptions of police' and 'Perceptions of municipality services', took the part of two separate latent concepts. The latent concept of 'Police-community nexus' is also explained by a different factor. Each factor, in turn, is shaped by observational variables with moderate or high factor loadings. The 3-factor model from EFA expressed the best goodness-of-fit of the data, so this model was selected to be estimated under the CFA framework.

In the EFA selected solution, as well as in the CFA model, the three factors obtained are associated, but while 'Perceptions of police' and 'Perceptions of municipality' are moderately correlated, associations with 'Police-community nexus' are very low. These findings refute evidence from previous studies where the performance of different public agencies in the local context, and sometimes, measures about police-community

relations are grouped into a single and unidimensional latent concept of ‘Public control institutions’. However, it is relevant to notice that the scales used in this study are only proxies: previous findings should be confirmed in further studies using more accurate measures for the concept of ‘Perceptions or assessments of ‘Public control’ institutions’, and for the concept of ‘Police-community nexus’.

Confirming previous findings, as correlations among ‘Perceptions of police’, ‘Perceptions of municipality services’ and ‘Police-community nexus’ are moderate or low, the VIF test within linear regression models demonstrated that there was no multicollinearity problem. Thus, those variables can be introduced in parallel in regression models with total confidence.

Control variables

Based on the multicollinearity diagnoses, it was concluded that in further logistic regression models (single or multilevel), the variables of ‘Main activity of the household head’ and ‘Working position’ would not be included together due to severe risk of collinearity. One of them should be chosen in the tested models to represent the occupation status of the household head. Similarly, ‘New family income’ and ‘Education level of the household head’ have a moderate risk of collinearity, so both variables should be tested together and separately in regression models in order to avoid the risk of collinearity, which, as a consequence, would increase the risk of obtaining biased regression estimators.

CHAPTER VI. VIOLENT AND PROPERTY VICTIMIZATION IN SANTIAGO NEIGHBORHOODS

VI.1. Introduction

The concentration of crime victimization in certain groups and places, the repetition of victimization over the same targets within a short period of time, and the enormous levels of victimization risk in some groups are questions that have claimed the interest of criminologists for decades. As Pease and Tseloni argue (2014: 17), 'People suffer very different levels of victimizations. Part of that is due to who they are, part to where they live. (…) part is due to the combination of person and place characteristics'.

Attempting to answer those questions, 'Lifestyle exposure' and 'Routine-activity' theories have offered two different explanations, under a micro-level approach, to the occurrence of crime victimization. Those theories have dominated research for the last four decades, making significant contributions to the understanding of the phenomenon, especially when treated in a complementary way. Both theories share the idea that a victimization experience is more likely to occur when there is a convergence of motivated offender, attractive target and absence of capable guardianship, in the same time and space. Therefore, different types of people's profile may have diverse risks of becoming victims of a crime, depending on their ascribed characteristics (e.g. gender, age, race) and their achieved characteristics (e.g. occupation, income), because these characteristics are associated with 'routine activities' which involved risky behaviour, and as a result, carry with them shared expectations about appropriate behaviour.

As was discussed in the theoretical chapter, analysis about the potential causes of victimization always should be done in probabilistic terms. Thus, researchers should offer a detailed explanation of the process or mechanisms that link certain personal or family characteristics with routine activities or situational circumstances that may expose them to victimization. In the case of the present thesis, three groups of household characteristics were considered as factors which can increase the likelihood of family members becoming victims of violent or property crime:

Regarding *household composition and family vulnerability*, female headship and the presence of children at home have been considered risk factors for victimization, because women going to work may increase their exposure to risky places and situations. When a mother works she cannot look after her children, and they become more vulnerable to any risky situation. Additionally, the presence of children at home who are outside the school system has also been considered a variable that expresses greater vulnerability of the home and its members.

Concerning *family socioeconomic status,* the literature has demonstrated that social class and income are inversely associated with many types of violence and victimization. For instance, low social class families are strongly correlated with homicide, for both victims and offenders. Besides, in households where the head is the single or main source of income within the family, an unemployed condition puts the family in a vulnerable position in respects of any contingence or risky situation.

Related to *residential stability and quality of dwelling*, studies have shown that a newcomer to a house is more at risk of being a victim than the former resident, because the former resident was had 'more capable guardianship' of their family and their home. As well as this, the lack of legality and the poor conditions of property (home), particularly in peripheral and high-risk areas, are factors that may exacerbate the social vulnerability of families living there.

Lastly, recognizing that the factors associated with the risk of victimization are not randomly distributed in time and space, beyond personal and/or family characteristics, it is necessary to acknowledge how these factors can differently affect victimization in diverse contexts.

Concerning the **analytical strategy**, to assess household factors which are associated to victimization risk by violent and property crimes, which occurred within a local context, crosstab analysis and conventional regression modelling are accurate tools. Considering victimization is a relatively rare event and households suffering more than one crime within their residential neighbourhood in a 12-month period, is even less common,

victimization measures are treated as dichotomy variables, and logistic models are the most appropriate regression analysis.

In this context, this chapter seeks to satisfy three different but complementary aims. Firstly, to identify and describe two variables linked to the phenomena of crime victimization: i. Household violent victimization, and ii. Household property victimization. The variables involve crime events suffered by the respondent or any member of his/her household during the twelve months prior to the survey and within the neighbourhood limits. This topic is addressed in the next section of this chapter.

The second aim is to identify and describe variables related to demographic and socioeconomic features of households and which are commonly tested in ecological studies of crime. Using cross-tabulation tables and chi-square test, those variables were described and associated with violent and property victimization at household level. Descriptive analysis is included in the third section of the chapter.

In the four section, the most important aim is pursue, modelling the association between household socioeconomic variables and the dependent variables -violent and property victimization- through the statistical method of 'binary-logistic regression model'. Based on statistical outputs the most relevant predictor variables were selected for further analysis. After that, attempting to test how explanatory factors can differently affect victimization in different contexts, the last models were compared in two different contexts: a) areas with high or very high concentration of poverty and b) areas with medium or low concentration of poverty. Those analyses were assumed as a preliminary approach to the more complex models which, including both individual-level and neighbourhood-level variables, will be tested in the next chapter (chapter VII). In other words, the logistic models tested in this chapter represent a 'base-line' of the further multilevel models. Lastly, the summary section is considered at the end of this chapter.

VI.2. The Experiences of Victimization in Households of Santiago neighbourhoods

VI.2.1. Violent and property victimization distributed at household level

In Santiago city in Chile, based on the 2010 community-survey developed by the University of Chile, around 15% of households have been victims of a crime during the twelve months prior to the survey application - using data weighted at household level. Comparing this figure of victimised households, by any crime, with the 'total household victimization' (aggregated index) of the Metropolitan Region of Chile, provided by the National Survey of Victimization (ENUSC), it is possible to state that the total victimization in this study is 42% lower than the total crimes that occurred in the capital (26%) during the same time period (year 2010) - see Table VI1. In other words, the University of Chile survey under-represented the total amount of victimised households in Santiago city. However, when the survey asked about crime victimization occurring within the residential area (neighbourhoods) the difference between this figure and that reported by the National Source of Data (ENUSC), regarding the urban area of the Metropolitan Region, was insignificant: in the University of Chile community-survey around 10% of households were victimised, whereas in the national survey 11% of households declared had been victims of a crime in their neighbourhood - see Table VI.1.

In other words, the University of Chile survey tends to under-report victimization events occurring outside the residential area. The main reason of that could be the fact that the focus of the questionnaire was on portraying security problems and community's resources present in the respondents' local neighbourhoods, the security problems of the city and the country, instead, were not addressed. Thus, the University of Chile survey meet the aim of offering an adjusted image regarding the level of households victimization which take place within the local neighbourhoods of Santiago city, and in agreement with figures provided by the official sources (ENUSC).

Table VI. 1. Prevalence of Household Victimization in the Metropolitan Area and within neighbourhood of residence, by types of crime and sources (2010)

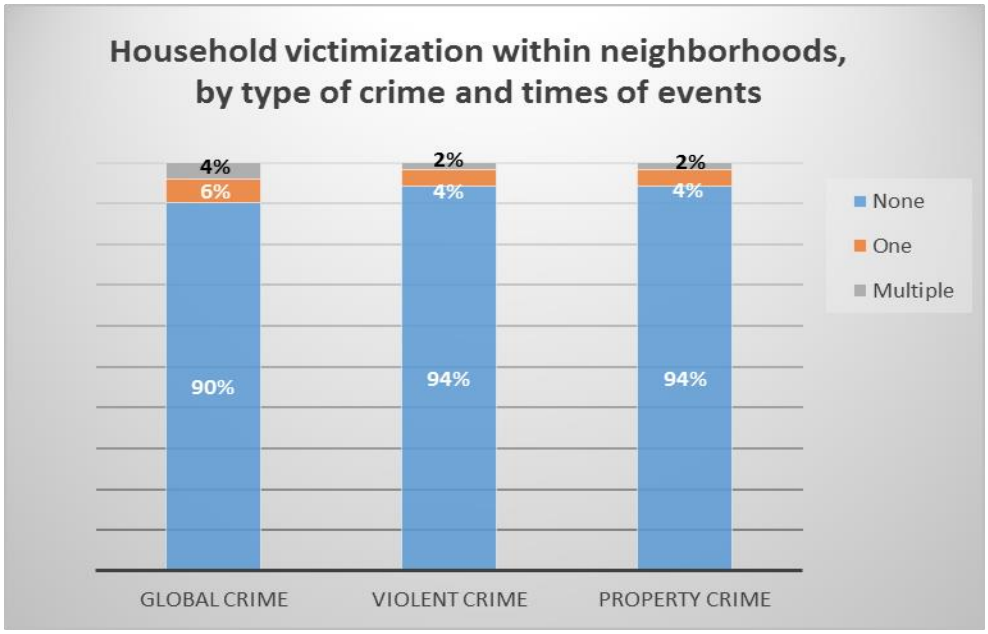
	ENUSC (2010)		U.Chile Study (2010)	
	Metropolitan Region	MR Neighbourhoods	Santiago City*	Santiago Neighbourhoods
Mugging	5.0%	0.9%		
Robbery	6.0%	1.8%		
Injury	1.5%	0.6%		
Total violent crime	**11.6%**	**3.2%**	**8.0%**	**5.9%**
Theft of car's articles or objects inside	5.3%	2.7%		
Vehicle theft	1.5%	0.8%		
Burglary	2.9%	2.9%		
Property theft (only crimes)	**9.3%**	**6.3%**	**6.8%**	**5.8%**
Minor theft (minor offense)	**9.2%**	**2.1%**	**n.d.**	**n.d.**
Total household victimization	**26.4%**	**11.1%**	**15.2%***	**10.0%****

** This figure respond to the variable 'Prevalence of Victimization' of any family member in last twelve months.*
*** This figure respond to the variable created in this study 'Global victimization' (violent + property) occurred to any family member within the boundaries of the residential neighborhood.*
Source: Own preparation based on data from National Survey of Citizens Safety (ENUSC) and data from the University of Chile (2010).

However, when distinguishing criminal categories, the comparison is slightly different (see Table VI.1). The University of Chile survey, respect to violent crimes, presents a level of underreporting with respect to official figures for the metropolitan area (by about one-third). However, when it comes to reporting cases of violent victimization occurring within the local context, the University's instrument seems to offer a good approximation to the phenomenon, revealing a greater proportion of cases than the national survey (5.9% vs 3.2%). By contrast regarding property crimes -without considering petty larceny that was not consulted by the University instrument, the level of under report with respect to the official figures of the city is less than the third (27%), but regarding crimes that occur within the neighbourhood, the level of under report is only 8%. In short, the University's survey seems to capture in a good way the events occurring within the local context, thus responding to the objectives for which it was created and to this study aims.

Concentrating on the data of this study, particularly regarding multiple victimization, when looking at Figure VI.1, it is possible to conclude that within the group of victimised households (10%), while 60% have suffered a crime once in their neighbourhood during the past year, 40% have been victimised on multiple occasions in the same context. Among the victimized households in their neighbourhood, at least 52% of them have been victims of a violent crime (around 5.9% of the sample). Regarding this group of victimised households, while 71% have been victims once during the past year, 29% have been victims twice or more during the past year, within the same local context (those figures represent the 4% and 2% of the total sample, respectively) - see Figure VI.1.

Figure VI.1. Household Victimization within Santiago MNs, by type of crime and time of events



Considering 'Property victimization', the results showed that 5.8% of households have suffered this type of crime in the local context. Within this group, while 73% have been victimised once during the past year, 27% have suffered property crime on more than one occasion - see Figure VI.1. Household violent victimization and household property victimization are moderately associated, which means that near a third of the victimised households have suffered both types of crime during the past twelve months. The addition of these two measures into the variable 'Household Global Victimization' results in a total of 10% of victimised households in the neighbourhood of residence.

Table VI. 2. Crosstab of Violent vs Property Victimization*

		Property victimization		
		No	Yes	Total
Violent victimization	No	5226	229	5455
		90.2%	4.0%	94.1%
	Yes	244	**96**	340
		4.2%	**1.7%**	5.9%
Total		5470	325	5795
		94.2%	5.8%	100%
*Chi-square test: 349.3 (sig.0.00)				

VI.2.2. Violent and property victimization distributed at neighbourhood level

Looking at those victimization indicators in the aggregate sample at micro-neighbourhood level (MNs), it is observed that there is a vast range of distribution among MNs in the two victimization variables. Concerning household violent victimization, nearly 31% of MNs (74 cases) have no household having this type of victimization, and 60% of MNs have less than 5% of victimization prevalence (145 cases). Despite these positive figures, it is relevant to notice that there are 21% of MNs (51 cases) with a prevalence of victimization over the mean (between 6 and 10%), and after that, there are 19% of MNs (44 cases) with a very high level of prevalence of victimization (between 11% and more than 20%) - see Figure VI.2. Comparing this level of household violent victimization occurring within the micro-neighbourhood boundaries, with the level of household victimization by violent crimes of the Metropolitan Region - reported by the 2010 ENUSC: on average 11.6% and 3.2% regarding the local context - it is possible to assert that those MNs are the territories for which this thesis is searching to find explanatory factors to prevent crime.

Regarding household property victimization, 34% of local areas or MNs have zero level of victimization prevalence (82 cases), and then more than 63% of neighbourhoods have a level of prevalence around 5% or less, in total 153 cases. After this majority group, there is a reduced group of neighbourhoods, 16.5%, or 40 cases, with a prevalence level of victimization between 6 and 10%. Finally, likewise for violent victimization, there are 20% of MNs with a high or very high level of victimization prevalence (49 cases), where

between 11 and more than 20% of households have suffered a property crime in the prior year of the survey.

Figure VI. 2. Percentage of MNs by victimization prevalence and type of crime

In synthesis, based on the National Official Data (ENUSC, 2010) and the present study dataset, it is possible to conclude that the experience of victimization is overall a rare event, and even more so in the area of residence. Considering specifically households who have suffered violent or property crimes within their residential area of Santiago city (micro-neighbourhoods), victimization has affected around 10%-12% of households. A similar figure has been found in the national survey of safety, regarding crimes occurring within the residential-urban areas of the Metropolitan Region.

This finding is consistent with international literature based on victimization data. Hoyle (2012) asserted that in the United Kingdom the risk of being a victim of a minor offence is relatively high but the risk of being victim of a serious crime - such as those measured in the present study - is low. In addition, within Santiago neighbourhoods the experiences of victimization suffered by some individuals and households tend to be repeated, in a similar way to that described by Pease and Tseloni (2014). While the authors found that an average of 40% of crime events suffered by individuals or households are repeats against targets victimised in the same year, in our study almost three of each ten (nearly 30%) victimised households have been victims in multiple occasions within the same local context. Although in absolute numbers the group of repeated victimised households

is small, the fact that victims and offenders daily share the same residential area and, probably, know each other, may have significant consequences on the victims' perceptions and daily behaviours.

On the other hand, the distribution of the level of victimization prevalence among neighbourhoods is highly unequal, having areas with 0 or 4% of victimised households, and others with more than 11% of victimised households. This finding is also consistent with evidence from international literature (Pease and Tseloni, 2014) and, in particular, coherent with evidence from Chilean studies concerning the Santiago city context (e.g. Blanco, 2010; Frey, 2009; Dammert and Oviedo, 2004).

In this context one wonders why the risk of victimization is higher for some people/households and within some contexts than others? Which socio-economic or demographic factors can explain that higher risk? To answer those questions, associations between household factors and victimization in Santiago neighbourhoods are analysed in the next two sections.

VI.3. Associations between Household Features and Crime Victimization: Descriptive Analysis

In this section, the association between socio-demographic variables, at household level, and the two measures of victimization is evaluated: household violent victimization and household property victimization. After the selection of individual and household factors which explain, in part, the higher or lower risk of victimization, it will be easier to develop regression models (logistic). The regression models, included in the next section, attempt to test the association of each socio-demographic variable in the prevalence of victimization, controlling for the other variables.

VI.3.1. Household composition and family vulnerability conditions

Concerning the influence of household-composition factors, in Figure VI.3 it can be observed that households headed by women have a higher level of violent and property victimization than households headed by men, but only the difference regarding property victimization is significant. Thus, the association between household-head gender and

household victimization is only confirmed regarding the last type of crime (according to the chi2 test, p-value < 0.05).

As observed in the Figure VI.4, the presence of at least one child at home also establishes a significant difference in the level of household victimization. The prevalence of violent victimization in households is significantly higher when there is at least one child among the family members (7.4%) compared to the family without a child (4.2%). In the case of property crimes, the prevalence of victimization is also higher in households where there are children relative to families without children (6.5% versus 5%). Thus, concerning both types of victimization the association between variables is significant (according to the p-value < 0.05).

Figure VI. 3. Victimization Prevalence in MNs, by type of crime and gender of household-head

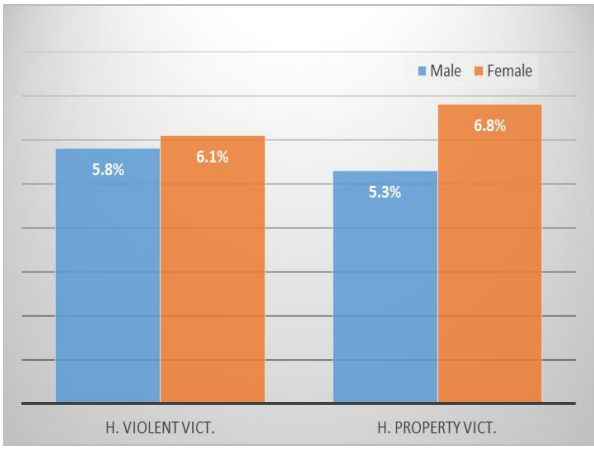


Figure VI. 4. Victimization Prevalence in MNs, by type of crime and the presence of child at home

On the other hand, the fact that in some families there are children out of the school system is not directly associated with the prevalence of household victimization by any type of crime - according to the crosstab and chi-square test. In both types of crime victimization the prevalence level is very similar between families with or without children out of the school system.

VI.3.2. Family socioeconomic status

In order to test the association between family socioeconomic status (SES) and victimization experiences, five variables were analysed: the education level, main activity and working position of the household-head, family income with five categories, and income dependence.

Concerning the first variable, as observed in Figure VI.5, there is a significant association between the level of education achieved by the household-head and the occurrence of violent or property victimization of any family member in the local context (according to chi2 test, p-value < 0.05). Thus, greater prevalence of household victimization by property crimes is seen in households where the head has a higher level of education (7.3%). These households are probably part of a high SES status, and so are attractive targets for thieves or burglars. On the other hand, a higher level of violent victimization is observed within households where the head has a secondary level of education (6.5%), which can be considered more common within families from middle or lower-middle SES.

Regarding the main activity of the household-head, as shown in Figure VI.6, violent victimization prevalence is higher among households where the head is employed (6.7%), followed by households where the head is unemployed (5%); victimization is less relevant when the household-head is retired or inactive (housewife, student or incapable for work). Within property crimes, the higher proportion of victimised households is found in the group with unemployed-head (6.8%), followed by employed-head (6.3%). Nonetheless, only the association between main activity of the household-head and household violent victimization is statistically significant; the association with property victimization is not relevant (according to the crosstab analysis and chi2 test).

Figure VI. 5. Victimization prevalence by the education level of the household-head

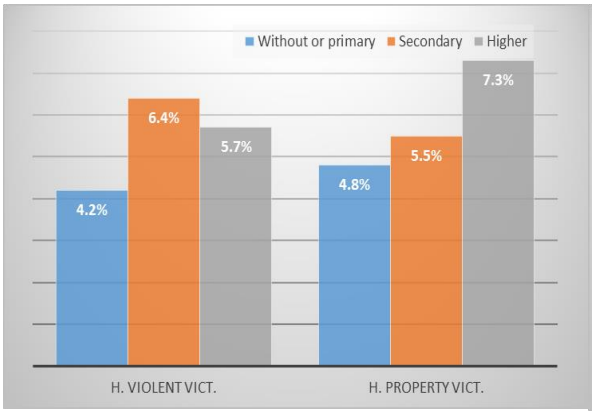
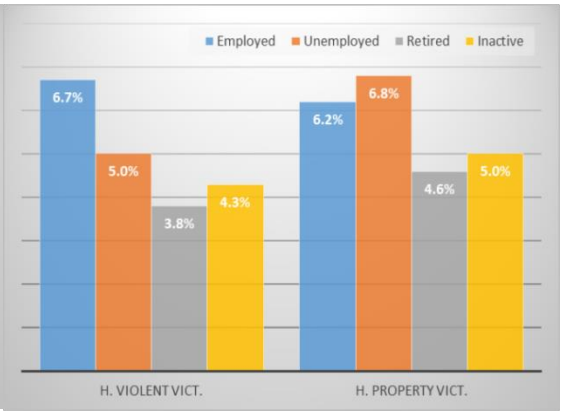


Figure VI. 6. Victimization prevalence by the main activity of the household-head

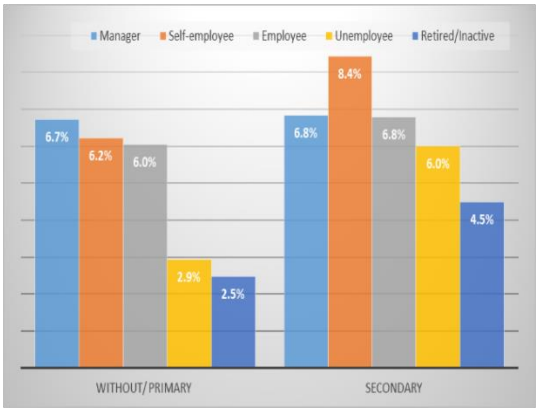


As observed in Figure VI.7, between the working position of the household-head and the prevalence of household victimization there is a significant association, in the case of violent crime as well as property crime (based on the chi2 test, p-value < 0.05). In both types of crime, victimization prevalence is higher among households headed by self-employees. Concerning violent victimization, households head by a manager or an employee also have a higher prevalence of victimization than the average (5.9%) and significantly higher than families headed by a retired or inactive person. In the case of property victimization, families headed by an employee or someone unemployed have a higher prevalence of victimization than the average and also higher than the family headed by a retired or inactive person.

In addition, considering only the group of violent victimised households (see Figure VI.8), it is possible to argue that households where the household-head only has a secondary level of education and is a self-employee the prevalence of victimization is clearly higher; also, it is significantly higher among households headed by managers when they have a primary or secondary level of education. In those types of family, the socioeconomic status is probably from middle status to lower socioeconomic status. Instead, families where the household-head has a higher education in any working position, probably belonging to middle-high or high SES, have a lower prevalence of victimization. However, this last association is not expressed in the graph because it is not statistically significant (according to the crosstab and chi2 test).

Figure VI. 7. Victimization prevalence by the working position of the household-head

Figure VI. 8. Violent victimization prevalence by the working position and education level



On the other hand, regarding the association between family income and household victimization, Figure VI.9 shows a higher prevalence of victimization by violent and property crime among families of a high-income level (around 7%). However, middle income families also have a similar proportion of victimization prevalence by property crime. Thus, according to the chi2 test, there is no significant association between family income and household victimization. By contrast, there is a significant association between income dependence and both types of household victimization (see Figure VI.10): in both cases there is a higher prevalence of victimization among families of middle and high levels of income dependence, which means large families where just one or two members contribute to the income rather than families where more members contribute or where the size of the family is small (one or two members). These results confirm previous findings, that large families with children and from middle to low SES have a higher risk of victimization, particularly by violent crime.

Figure VI. 9. Victimization prevalence by the level of household income (without including state aid)

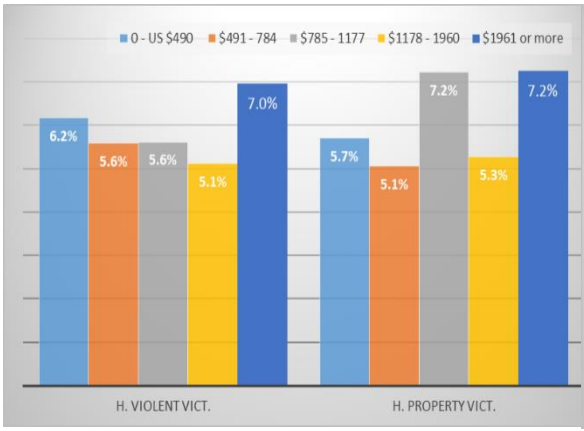
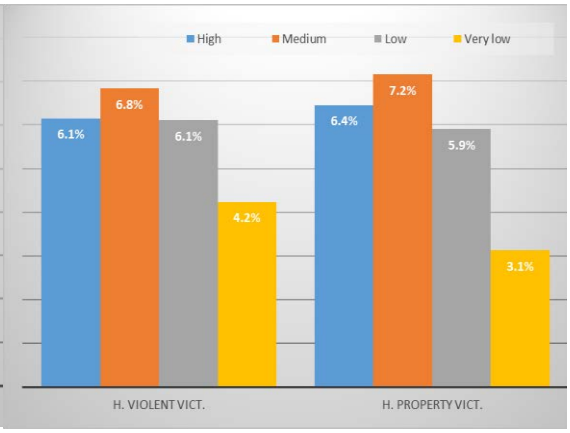


Figure VI. 10. Victimization prevalence by the level of income dependence



VI.3.3. Residential stability and quality of dwelling

Concerning the main features of the family home and the residential stability of the family in the same neighbourhood three variables were examined: whether the ownership status of the family home is regular or irregular;[114] whether the dwelling is overcrowded (more than 2.5 persons sleeping in the same room) or not; and the length of residence of the family in the same dwelling - for a more detailed description of the variables see the Data and Methods chapter.

As observed in Figure VI.11, the prevalence of violent and property victimization is higher among households who live in an unstable or irregular dwelling (8.4% and 7.5%, respectively), compared to households who live in their own home or rented houses (5.6%). Nonetheless, according to the chi-square test, those differences among type of dwellings are only statistically significant in the case of violent victimization prevalence; there is no significant association in the case of property victimization.

[114] Dwellings in an unstable or irregular condition are: illegal or irregular occupied homes, free houses or houses freely transferred and rented without contract (see Data and Methods chapter).

Figure VI. 11. Victimization prevalence by ownership status of the family house

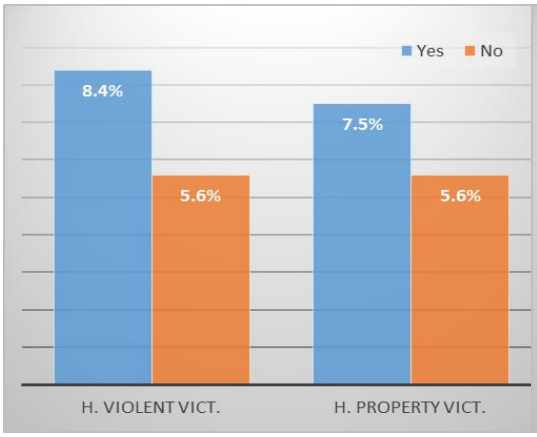


Figure VI. 12. Victimization prevalence by length of residence in the neighbourhood

In addition, households who live in overcrowded dwellings also have more prevalence of household violent victimization, compared to families who live in houses with plenty of space (7.5% versus 5.7%). Regarding household property crimes no significant differences were observed between groups related to the quality of dwellings; in fact, a greater proportion of property victimization was seen in families living in non-overcrowded dwellings than the opposite situation.

Consistent with previous findings about ownership status, the prevalence of violent victimization is greater among households who have lived less than six years in the same neighbourhood (7.4%), compared to families who have lived six years or more in the same area (see Figure VI.12). Actually, the positive association between the two variables demonstrated that the more years a family resides in the same neighbourhood, the smaller is the prevalence of household violent victimization. The same trend is observed concerning the prevalence of household property victimization. In both types of victimization association with family length of residence is statistically significant. In other words, when a family lives in a stable dwelling (owner or regularly rented) and remains in the same place for many years, family members have less probability of being victims of a violent or property crime.

Findings obtained thus far offer strong arguments to support the three hypotheses proposed in this chapter: family vulnerability, low socioeconomic status, poor quality of

dwellings and low residential stability are all factors associated with higher violent victimization, and also, in some cases, associated with higher property victimization. However, in order to confirm the contribution of each variable, when other variables are controlled for, logistic regression models were tested in the next section. In addition, through logistic regression models examination was made to ascertain whether the influence of household level variables is significant when the sample is divided by different types of neighbourhoods (according to the level of concentration of poverty).

VI.4. Associations between Household Features and Crime Victimization: Explicative Analysis

In order to confirm or refute hypotheses regarding the associations between demographic and socioeconomic variables and the experiences of victimization occurring in the local context -Santiago neighbourhoods - logistic regression models were tested in this section (Models 1, 2 and 3). Only demographic and socio-economic variables at household level were included as predictor variables;[115] personal characteristics such as gender or age were not tested because dependent variables respond to a household event. After testing the influence of those variables, the best-selected model was used to compare the risk of violent victimization in two different types of neighbourhoods, according to the level of poverty concentration in such contexts (Model 4). The results obtained from those regression models are used later in the thesis as a baseline to compare with findings achieved from 'multilevel of regression models' in the next analytical chapter (VII).

All regression models of household victimization, by violent and property crimes, are well fitted, according to the chi-square test and the Log Likelihood Ratio test (-2xLLR test).[116] In all models, p-values associated with the -2 x LLR test are lower than 0.001, so it is possible to reject the null hypothesis and to support the idea that most of the tested variables are significantly linked to victimization events. However, as the explicative capacity of models are very low - expressed by the Pseudo RSquare - additional models

[115] In order to confirm the influence of each group of variables, they were first introduced in models through each dimension group: family composition, socioeconomic status and residential stability. The outputs of these models are located in the appendix of this chapter.

[116] The Log likelihood ratio test (-2 x LLR test) is a statistical test used to compare the fit of two models. The p-value allows rejection of the null hypothesis in favour of the alternative hypothesis.

were tested using Probit[117]. Results of these models expressed similar goodness-of-fit indicators and almost the same significant variables as those found in the logistic models – outputs of the model comparison were included in the Appendix VI. Thus, as the influence of explanatory variables was confirmed, and the aim of this analysis is to find associations between variables, only the significance and direction of these relations will be interpreted in the next pages. The predictive power of each variable will not to be analysed since the prediction of victimization events was not searched for.

VI.4.1. Household composition and family vulnerability conditions

Offering support for hypothesis 1, as shown in Table VI.2, model 1 revealed that there is a positive association between the 'female-headed household' and the likelihood of being a victim of violent crime and also of property crime, by any member of the family, when the presence of a child at home and the presence of a child out school are controlled for. However, those associations only became significant when socioeconomic variables and residential stability variables were included in models 2 and 3 (M2 and M3). Thus, in M3 when all other variables are holding constant, the likelihood of victimization by violent or property crime are higher in households headed by a woman than in households headed by a man. Those associations are significant with 99% of confidence.

In the same way, in M1 the 'presence of child at home' is also positively associated with the risk of household violent and property victimization, while the other variables concerning family vulnerability are controlled for. Nonetheless, when household socioeconomic variables are introduced in M2, the association between the presence of child and household property victimization did not become significant. Then, in M2 and M3 presence of a child is only associated with the risk of violent victimization, the likelihood of being a victim of a violent crime for a household where there are one or more children is higher than for a family where there is no child - see Table VI.2.

[117] The main difference between logit and probit is the link function. In Probit, $Pr(Y=1|X)=\Phi(X'\beta)$. In the other way, the probit curve approaches the axes more quickly than the logistic curve, because logistic has slightly flatter tails. However, the logit model can be more easily interpreted than probit models – see Data and Methods chapter.

Table VI. 2. Logistic Models of Household Victimization, violent and property crimes (OR)

	Violent Victimisation			Property Victimisation		
Variables household level	M1	M2	M3	M1	M2	M3
Female household-head (yes)	1.17	1.24+	1.26*	1.18	1.25+	1.26*
Children at home (yes)	1.81**	1.63**	1.55**	1.31**	0.97	0.95
Child out of school (yes)	1.00	0.95	0.94	1.02	1.10	1.12
Education of household-head						
(ref. primary or without education)						
Secondary education		1.57**	1.50**		1.04	1.02
Higher education		1.44	1.34		1.17	1.11
Working position of household-head						
(ref. inactive)						
Manager		1.77**	1.56*		0.92	0.85
Self-employee		2.02**	1.78**		1.50**	1.38*
Employee		1.76**	1.50*		1.14	1.02
Unemployed		1.64	1.49		1.57	1.37
New family income (ref.$1961 or +)						
0 - US $490		1.21	1.22		0.76	0.76
$491 – 784		0.96	0.97		0.76	0.76
$785 – 1177		1.16	1.17		1.07	1.07
$1178 - 1960		1.05	1.05		0.97	0.97
Income dependence						
(ref. very low dependency)						
High level		0.93	0.90		1.83**	1.82**
Medium level		1.03*	1.03+		1.92**	1.91**
Low level		0.86	0.87		1.69**	1.71**
Irregular dwellings (yes)			1.35*			1.33
Overcrowded house (yes)			0.91			0.72
Length of residence (ref. very-high)						
Low (0 - 5.5 years)			1.60*			1.40+
Medium (6 - 19.5 years)			1.70**			1.29
High (20 - 35.5 years)			1.38+			1.25
Log likelihood	-1.338	-1268.5	-1256.2	-1.329	-1280.5	-1267.8
-2 x LLR Test (M2 - M1)	-	139.9**	24.7**	-	97.4**	25.4**
Pseudo R square	0.011	0.025	0.03	0.003	0.015	0.02
Number of observations	5816	5681	5630	5845	5707	5656

** p-value < 0.01, * p-value < 0.05, + p-value <0.1

Those results confirm findings previously made with the same dataset and multilevel modelling, where the presence of a child at home is also associated with a higher likelihood of household violent victimization (Manzano, 2014). Besides, a similar finding was obtained from a multilevel study by the University of Chile, which examined 2014 survey-data from poor neighbourhoods of Bogotá, Lima and Santiago. In that study it was demonstrated that the odds of being a victim of a violent crime for a household headed by a woman and with the presence of a child is higher than in a household where the head is a man or there is no child (Manzano, Mohor and Jiménez, unpublished[118]).

Based on lifestyle and routine-activity theories, female-headed households are more vulnerable to risky situations because female labour force participation compels them to leave the home unoccupied for long hours daily, and because when going out to work women expose themselves to risky places and risky situations (Meir and Miethe, 1993; Brookman and Robinson, 2012). At the same time, if children are part of this family and their mother works (or both parents do) it is more likely that children or adolescents spend more time in public places without adult supervision, which increases their risk of being a victim of violent crime (Brookman and Robinson, 2012). Nonetheless, following Pratts and Turonovic (2016), it is possible to argue that not all families headed by a woman or composed by children are exposed to the same level of victimization risk. Probably families headed by women and/or with children, when they live in poor areas and have weak support-networks, are more exposed to violent crime than families from rich areas - as SDT asserted (Sampson y Groves, 1989; Shaw y McKay, 1969).

On the other hand, in the light of social vulnerability literature it can be argued that households headed by a woman are more exposed to the effects of any contingency, such as a crime event and its consequences. This is particularly because women have to balance their time between work and childcare, reducing their chances of getting a good job, and because they receive on average lower income than men (Rygel, O'Sullivan and Yarnal, 2006). In Chile, for instance, men earn more than women across

[118] Manzano, L., Mohor, A. and Jiménez, W. (2017). Incidencia de factores comunitarios y organizacionales en el riesgo de victimización violenta en barrios vulnerables de Bogotá, Lima y Santiago: Un test empírico de las teorías de desorganización social y eficacia colectiva. (Paper in process of publication).

different age groups, level of education, type of employment and occupational category; on average, the salary of a woman is a third lower than the salary of a man.[119]

Concerning the association between children out of school and household violent or property victimization, outputs of M1 and subsequent models show that there is no significant relation between those variables. These findings confirm the relational analysis made in the previous section. The low number of families presenting with this condition and its multiple causes in each family probably explain why this severe family problem is not linked to a vulnerability factor to increase the likelihood of violent crime or property victimization.

In sum, these findings in great part allow confirmation of study hypothesis 1 (H1). Clearly household composition, when linked with a vulnerable condition of the family, such as female household-head and the presence of children at home, has a relevant influence in the risk of violent victimization. The female household-head is also associated with a greater likelihood of family members being victims of property crime within the local neighbourhood.

VI.4.2. Family socioeconomic status

Attempting to evaluate hypothesis 2 of this study, a set of socioeconomic variables were introduced into models: the education level of household-head, working position of household-head, new family income, and income dependence (see Table VI.2). Outputs of models 2 and 3 (M2-M3) show that the level of education of the household-head has a significant association with violent victimization, but the relation with property victimization is not statistically significant.

Nonetheless, the influence of the level of education of the household-head is contrary to expectations (H2): the likelihood of being a victim of violent crime for a household where the family-head has secondary level education is higher compared to a household where the family-head does not have education or only has primary level. A similar association

[119] Extract from the discourse of the National Director of Labour Office, María Cecilia Sánchez (January 2011), retrieved in June 2016: http://www.dt.gob.cl/prensa/1618/w3-article-98691.html

is observed when the household-head has higher education. Thus, violent victimization is more likely among families where the household-head is well-educated rather than families where the household-head is poorly educated (primary education or without studies). In the case of household property victimization, although the association is not significant, the likelihood of being a victim is also greater when the household-head has a higher level of education compared to a household where the head has only primary education or does not have any.

In a country like Chile where the primary and secondary levels of education are mandatory (12 years of schooling), but access to higher level education is still limited - as was seen in the background chapter - a well-educated household-head can be assumed to be a good predictor of family higher income level. Thus, it is arguable that middle and middle-to-high status families are more vulnerable to violent crime than poor families. Nonetheless, other SES variables should be examined to confirm this finding.

The 'Working position of household-head' also has a significant association with violent and property victimization in M2 and M3. The odds of being a victim of violent crime for a household where the family-head is manager, self-employee or employee are higher compared to an inactive family-head (retired, housewife, student, disabled or unable to work), controlling for other variables. Although the influence of the category 'unemployed' is not significant, this condition is also associated with a high risk of violent victimization. Concerning property victimization, households where the family-head is 'self-employee', 'employee' and 'unemployed' are more likely to suffer this type of crime, compared to households with an inactive family-head. Instead, households where the family-head is a 'manager' are less likely to become victims than households with an inactive family-head. However, only the influence of the category 'self-employee' is statistically significant.

Based on lifestyle and routine activity theories, those associations means that family members are at great risk of suffering violent or property crime when the household-head works (in any working position) because they spend most of their time outside the home: the family-head is more exposed to dangerous situations and/or places (e.g. public transport); they leave the house unoccupied and leave children without supervision,

exposing them to risky situations, particularly when they live in poor areas. When the family-head spends most time at home they can be a 'natural guardianship' of their family. As the association between the variable 'family income level' and household violent or property victimization is not significant, previous findings cannot be confirmed or denied. However, the association between 'income dependence' and household victimization, particularly property crime, can bring light to help us understand this issue.

Concerning violent victimization, the likelihood of being a victim is higher for families with medium level income dependency (between 0.34 and 0.5 level, for instance a family of 4-5 persons who live with two sources of income) than families with a very low level of dependence (equal to 1). Instead, the likelihood of violent victimization is lower for families with high dependency and also with low dependence compared to families with very low dependence, although those OR are not statistically significant. Regarding property crime it is more evident that the risk of household victimization is higher for each category of income dependence (high, medium and low) relative to very low dependence, which is synonymous with smaller families with a large number of income sources.

The evidence reviewed here contributes to rejecting H2: low household SES is associated with a high risk of violent victimization. On the contrary, the influence of 'education level of household-head', 'working position' and 'income dependence' tend to support the idea that the risk of violent victimization is higher among families from middle status to mid-to-high SES rather than poor families (low educated household-head, inactive and high dependency). Regarding property victimization, the influence of 'working position' and 'income dependence' leads us to believe that middle SES families and mid-to-low SES families have a higher risk of being victims of property crime than wealthier families. Nonetheless, as the evidence is not completely clear, the comparative analysis between different types of neighbourhoods, concerning H4, is needed.

VI.4.3. Residential stability and quality of dwelling

Offering support for hypothesis 3, M3 (Table VI.2) reveals that there is a positive association between violent victimization and 'irregular dwellings' - home ownership. In other words, the odds of being a victim of violent crime for a family who live in an unstable property are higher compared to a family who live in a dwelling owned, or in a legally

rented property. The same positive association is found between property victimization and 'irregular dwellings'; however, this relation is not statistically significant. Coinciding with the influence of 'women heads of household' and 'the presence of children at home', the effect of 'irregular dwellings' reveals that social vulnerability of households is associated with a higher risk of victimization, particularly violent victimization.

Apparently, the association between overcrowded house and violent or property victimization are in the inverse direction, namely, the presence of this variable may reduce the risk of victimization. However, this contradictory relationship is not statistically significant.

In addition, in M3 a significant association between violent victimization and length of residence in the same neighbourhood is shown. The likelihood of being a victim of a violent crime is higher for a family who have lived a low or medium time in the same areas compared to family who have stayed in the same place for a very long time (more than 36 years). Besides, the odds of being a victim of violent crime are also greater for a household with a high time of residence (between 20 and 35 years) compared to a family with a very long time of residence (more than 36 years). Similarly, there is a positive association between property victimization and low, medium and high length of residence, compared to residence of a very long time, although this relation is not statically significant.

Those findings confirm evidence exposed in the literature review chapter. Xie and Mcdowal (2008), for instance, assert that residential instability increases the risk of household victimization, especially property victimization. They argue that newcomers to the house face more risk than the former resident because they have weaker 'guardianship' mechanisms – such as fences, security alarms, and connection with neighbours. Besides, Xie and Mcdowall (2008), Smith and Jarjoura (1989), and other ecological studies of crime have argued that neighbourhoods which have on average greater residential instability show a higher risk of victimization, both violent and property - a topic that will be analysed in the next chapter through multilevel models.

The evidence obtained regarding the influence of irregular dwellings and low residential stability on the higher risk of violent victimization represents a strong argument to support hypothesis 3 of this chapter: low family length of residence and poor quality of dwellings are associated with higher risk of victimization by violent crime, but such relations are not confirmed in the case of property victimization. In other words, families with instability in their settlement and a reduced time living in the same area probably have scarce social bonds with neighbours and, as a result, have fewer possibilities to develop effective guardianship over their property and over their family members, particularly children and teens. In addition, this kind of family is less available to contribute to collective activities aimed at solving common problems.

As neighbourhood-level variables are not considered in this chapter, multilevel models were not tested here. However, to offer a comparative analysis about how those household-level variables behave across different types of neighbourhoods, the sample was segmented in two groups based on the percentage of poverty concentration present in each neighbourhood. This analysis is included in the next section.

VI.4.4. The influence of household features on crime victimization: disadvantageous vs advantageous neighbourhoods

In order to test hypothesis 4, the study sample was segmented into two groups: i. 4,004 cases which belong to neighbourhoods with a high concentration of population from working-class and low socioeconomic status (40% or more); ii. 1,856 cases which belong to neighbourhoods with a low concentration of poverty (39% or less) and linked to middle-high and high SES. As observed in Table VI.3, models were tested only for the dependent variable of violent victimization.

Within the **first group of neighbourhoods** (low SES), the variable 'female household-head' expressed a significant association with the risk of violent victimization. The direction of this relationship is the same as that previously interpreted: the likelihood of violent victimization is higher for households where the family-head is a woman than for households where the head is a man. The presence of children at home, instead, does not have a significant association within this group of neighbourhoods.

Concerning socioeconomic variables (see Table VI.3), only education level and working position of the household-head keep a significant association with the risk of violent victimization, and with the same sense. The odds of being a victim of violent crime are higher for a family with a well-educated household-head (higher education and secondary education) rather than a family with a low-educated household-head. In the case of working position, the relation with violent victimization risk is also the same. Positions like manager and employee are linked to higher risk of violent victimization within this type of poor area but, overall, self-employee shows the highest likelihood, always comparing those positions against the inactive household-head.

Regarding residential stability, the irregular status of home ownership and the length of residence maintain the same relations with household violent victimization as relations analysed in previous pages, considering the whole sample. Within the poor neighbourhoods, the risk of violent victimization is higher for family members who live in irregular dwellings than for those who live in their own property or in a regularly rented house. Besides, the likelihood of violent victimization is also higher for families and its members who have lived in the same neighbourhood by a low, medium or long time compared to families who have lived there by a very long time (more than 36 years).

Within the **second group of neighbourhoods** (high SES), only the variable 'presence of children at home' has a significant association with the risk of violent victimization. The direction of this relation is the same as that analysed in previous pages: the likelihood of violent victimization is higher for households where children are part of the family composition, rather than households composed only by adults. This finding means that other vulnerability or socioeconomic variables have not influenced in the risk of violent victimization within this type of neighbourhood.

In sum, based on the previous findings (M3 and M4, Table VI.3), the H4 of this study can be partly confirmed. Although most of the variables analysed in models only have influence on the risk of victimization within neighbourhoods where the concentration of poverty is high (40% or more of families from mid-low and low SES), experiencing violent victimization is more likely among families with an apparently better situation than among the poorest families (household-head with secondary or higher education and in an active employment position). However, the influence of some variables leads us to think that

those middle SES families may still have features which reveal their high social vulnerability (female household-head, irregular dwellings and low residential stability).

Table VI.3. Logistic Models of Household Violent Victimization by Type of Neighbourhood

	Whole sample	Neighbourhoods of low SES (40% or more)		Neighbourhoods of high SES (less than 39%)	
Variables household level	M3	M3	M4	M3	M4
Female household-head (yes)	1.26*	1.38*	1.41*	1.06	1.05
Children at home (yes)	1.55**	1.24	1.22	2.50**	2.35**
Child out school (yes)	0.94	1.07	-	0.64	-
Education of household-head (ref. primary or without education)					
Secondary education	1.50**	1.77**	1.73**	0.84	0.83
Higher education	1.34	1.66*	1.70*	0.84	0.88
Working position of household-head (ref. inactive)					
Manager	1.56*	1.81*	1.77*	0.96	1.00
Self-employee	1.78**	2.05**	2.04**	1.17	1.19
Employee	1.50*	1.70**	1.68**	1.11	1.11
Unemployed	1.49	1.75	1.75	0.98	0.97
New family income (ref.$1961 or +)					
0 - US $490	1.22	3.23	-	0.82	-
$491 – 784	0.97	2.55	-	0.73	-
$785 – 1177	1.17	3.69	-	0.85	-
$1178 - 1960	1.05	4.17	-	0.62	-
Level of income dependency (ref. very low dependency)					
High level	0.90	0.95	0.94	0.75	0.73
Medium level	1.03	0.97	0.95	1.10	1.09
Low level	0.87	0.87	0.85	0.82	0.82
Irregular dwellings (yes)	1.35*	1.41*	1.42*	0.90	0.88
Overcrowded house (yes)	0.91	0.89	-	0.92	-
Length of residence (ref. very-high)					
Low (0 - 5.5 years)	1.60*	1.69*	1.69*	1.25	1.25
Medium (6 - 19.5)	1.70**	2.21**	2.19**	0.86	0.86
High (20 - 35.5)	1.38+	1.58*	1.59*	0.83	0.82
LR Chi-square(19) (sig.)	77.22**	87.05**	80.6**	19.12	16.5
Pseudo R square	0.03	0.047	0.044	0.03	0.02
Number of observations	5630	3852	3852	1778	1778

** p-value < 0.01, * p-value < 0.05, + p-value <0.1

VI.5. Conclusions

Based on the previous analysis (descriptive and relational), applied over the secondary data of the Santiago Neighbourhoods' study (by the University of Chile), it is possible to conclude that the experience of crime victimization is, overall, a rare event, and even more in the area of residence. In fact, household victimization by violent or property crime within local neighbourhoods of Santiago city has affected around 10%-12% of households. A similar figure has been found in the National Survey of safety 2010, regarding crime occurring within residential-urban areas of the Metropolitan Region.

This finding is consistent with international literature which has supported the conclusion that the risk of being a victim of a minor offence is higher than the risk of being a victim of a serious crime - as those measured in the present study. In addition, within Santiago neighbourhoods the experience of victimization suffered by some individuals and households tends to be repeated, similarly to the way international studies have demonstrated. In the present study, around 30% of victimised households have been victims on multiple occasions within the same residential area. Although the group of repeatedly victimised households is small, the fact that those victims and offenders daily share the same residential area and, probably, know each other, may have significant consequences on the victims' perceptions and their daily behaviours.

Additionally, the distribution of the level of victimization prevalence among neighbourhoods is highly unequal, having areas with 0 or 4% of victimised households, and others with more than 11%. This finding is also consistent with evidence from national and international literature, particularly with studies concerning the Santiago city context.

On the other hand, regarding the confirmation of the study hypothesis which aimed to establish the association between victimization variables and explicative demographic and socioeconomic factors at household level, based on logistic regression models, the following conclusions were found.

First, it is possible to conclude that household composition related to a vulnerable condition of the family, such as the family being headed by a woman and the presence

of children at home, has a direct and significant relationship with the risk of violent victimization. Similarly, households headed by women also have a greater likelihood of property victimization compared to households headed by men. Those findings allow confirmation, in great part, of study **hypothesis 1**.

Second, research findings show that the risk of violent victimization is higher among families from middle status to mid-to-high SES rather than poor families. This is in great part due to the family of a well-educated household-head (with secondary or higher education) and, at the same time, of an occupied household-head in a relative good position (manager, self-employee or employed) having a higher likelihood of violent victimization than families having a poorly educated household-head or a household-head in an inactive working position.

In a similar sense, the association between working position of household-head and income dependence allows us to believe that middle status families have a higher risk of property victimization than very poor or very rich families. These evidences contribute to refutation of study **hypothesis 2**. However, though the test of hypothesis 4 makes it is possible to complement those findings and assert that, within mid-low status and poorest status neighbourhoods it is more likely that those variables' relationships will be significant, in mid-high and high status neighbourhoods most of the previous associations are not significant.

Third, based on logistic regression outputs it is possible to support study **hypothesis 3**. Lower family length of residence and more unstable dwellings are associated with a higher risk of household victimization by violent crime, compared to families with a very long time of residence and a family living in a stable property. Those relations are not confirmed in the case of property victimization. In other words, families with instability in their settlement and a reduced time living in the same area probably have scarce social bonds with neighbours and, as a result, have fewer possibilities to develop effective guardianship over their property and family members, particularly children and teens.

Finally, concerning study **hypothesis 4**, within neighbourhoods where the concentration of poverty is high (40% or more of families from mid-low and low SES), experience of violent victimization is more likely among families with a better socioeconomic situation than the poorest families, but some of these families also share features linked with social vulnerability (female household-head, presence of children, irregular dwellings and low residential stability). On the contrary, within neighbourhoods where the concentration of poverty is low, only the presence of children at home is demonstrated to be directly and significantly associated with the risk of violent victimization at the household level.

In the next chapter the same associations will be tested within a multilevel modelling framework, and, in addition, social and organisational resources of local communities will be tested in order to examine the core hypothesis of this thesis.

CHAPTER VII. MULTILEVEL ANALYSIS OF VIOLENT AND PROPERTY VICTIMIZATION WITHIN SANTIAGO NEIGHBORHOODS

VII.1. Introduction

This chapter represents the core of this thesis since it addresses the main questions and research hypotheses, through a series of statistical analyses based on hierarchical regression models. The purpose of the chapter is to answer the following questions: *To what extent is high concentration of poor families and low residential stability, at the neighbourhood level, associated with a higher likelihood of violent and/or property victimization? To what extent are lower organisational mechanisms (feelings towards community, friendship ties, social interactions and collaboration), measured at individual and neighbourhood level, associated with a higher likelihood of violent and/or property victimization, at household level?*

Similarly, *to what extent are lower social cohesion and informal control associated with a higher likelihood of victimization? And, to what extent are the negative evaluation of formal control authorities (police and municipality) and the police-community nexus, at individual and neighbourhood level, associated with a higher likelihood of victimization?* The following is a brief summary of the theoretical framework, previously discussed in Chapter II, in particular the elements of the literature that support the study hypotheses.

The theoretical approach of this research is based on 'Social disorganization' theory (SDT) and the more recent idea of the 'Collective efficacy' model (CEM) and the 'New parochialism' studies, critically considered in the light of Latin-American studies of crime. These theoretical reflections are reflected in the hypotheses evaluated in this study.

From SDT it has been proposed that neighbourhood structural conditions (poverty, residential instability and ethnic heterogeneity) affect the capacity of the community to achieve common good and maintain social order, due to the weakening of social controls exerted by private and parochial networks. Therefore, the poverty, residential instability

and ethnic heterogeneity are associated with higher crimes rates, through the 'Social Disorganization' construct.

In relation to the concept of social disorganization, the CEM has addressed some critical points. Starting from the fact that nowadays infrequent interactions between neighbours are more common than frequent ones, CEM proposed that social cohesion combined with neighbours' willingness to intervene in local issues contributes to develop an 'effective community capacity to prevent crime'. Thus, the 'Collective Efficacy' mediates the influence of structural conditions on neighbourhoods' crime levels.

Although numerous studies in various contexts have been accumulated supporting evidence for CEM, some scholars have questioned and presented contradictory evidence about the internal validity of the 'Collective efficacy' construct and, the most relevant for the present thesis, its external validity, particularly the validity of the theory in the Latin-American context. Latin-American studies have shown that some modes of informal control are associated to high levels of violence.

Thus, to disentangle the question about which mechanisms mediate the relationship between neighbourhood structural conditions and crime victimization, in the Latin-American context, it is necessary to understand the complementarity between informal and formal control, as discussed in the 'New parochialism' approach.

The 'New parochialism' approach has hypothesised the existence of a new form of social control, which consists of the interplay between formal and informal control. The evidence supporting that hypothesis has demonstrated that even with the presence of dense ties, residents from poor areas do not have the capacity to produce social control by themselves; instead, they can do it by combining informal control and formal control, such as partnerships with authorities and police and bringing external resources to the community.

Concerning the relationship between police and community, a great amount of literature has demonstrated that satisfaction with police are associated with willingness to report crimes and with informal control actions. Besides, it has been concluded that in poor neighbourhoods the police are perceived as inefficient and unfair and, accordingly, police-community partnerships are difficult to construct.

Latin-American studies have described in most of the countries a negative perception of police and low levels of citizens' confidence, highlighting problems such corruption, politicisation and abuse of force. Even though Chilean police forces have been more favourably perceived than the police of other Latin-American countries, in poor areas the levels of confidence are lower and recently have decreased due to corruption cases. So, these elements could impair the construction of community-police partnerships.

Hence, although the accumulated evidence is limited, the 'New parochialism' studies offer some valuable hypotheses for the analysis of the role of public institutions and its influence on crime distribution within Latin-American cities, such as Santiago city.

Concerning the analytical strategy, to assess which household (level 1 units) and neighbourhood (level 2 units) factors influence household victimization risk, a set of multilevel regression models was estimated. A Random-Intercept regression model technique was applied, because this type of model provides a flexible and suitable framework for modelling multiple variances (within and between neighbourhoods).

This approach, allows the estimation of the proportion of the variation in the dependent variables which is due to differences between observations within the same neighbourhood, and due to differences between neighbourhoods, as well as estimating the contribution of household and neighbourhood level measures. In this study, it is possible to test study hypotheses about community mechanisms through MNs impact on household victimization. Considering that the dependent variables are binary (violent and property victimization at household level) Mixed-Effects Logistic models were used.

VII.2. 'Social Disorganization' Model for Explaining Violent and Property Victimization

VII.2.1. The null models and the influence of socioeconomic variables

Before testing the study, hypothesis associated with 'Social disorganization' theory (SDT), multilevel random-intercept models of both violent and property victimization were estimated, without including any explanatory variables. These kinds of models are commonly denominated 'null models' (see Table VII.1). Next, demographic and socio-economic variables at household level were introduced as controls variables (see M1 in Table VII.1). Personal characteristics, such as gender or age, were not tested because both dependent variables respond to a household event.

As observed in Table VII.1, the null model for both violent and property victimization reveal that variations in these outcomes are scarcely explained by differences between neighbourhoods (community-level effects), even before the introduction of any explanatory variable -according to the Interclass Correlation Coefficient (ICC)[120]. Thus, as Manzano (2014) wrote, there are few similarities between people who live in the same neighbourhood, within Santiago city, concerning victimization risk. Property victimization is slightly more affected by differences between neighbourhoods than violent victimization in the null model (ICC of 16.5% against 13.1%). The reason for this difference is not clear. According to Manzano (2014), as the proximity between victim and offender is commonly greater in violent crimes than in property crimes, the first type of crime tends to be more associated with characteristics clustered by type of neighbourhood, but in this case this assumption is not fulfilled.

In order to test 'the Ecological reliability of the contextual-effects'[121], the formula purposed by Goldstein, Kounali and Robinson (2008) was estimated in the null models and model 1 for 'household violent victimization'. Outputs revealed that with a cluster size of 23 and

[120] In models based on probit or logit estimation outputs do not provide any value for the within-level residual variance, so this indicator should be replaced by the number Pi in the formula of the Interclass Correlation Coefficient (ICC or ρ): $\rho = \psi / \psi + \pi^{2/3}$, where ψ is the between level residual variance, and π is the number pi to the power of 2/3 (Rabe-Hesketh & Skrondal, 2013).

[121] $[(n*\sigma u^2)/(n*\sigma u^2 + \sigma e^2)]$, where n is the average cluster size, σu^2 the constant variance and σe^2 the residual variance].

around, the reliability fluctuate between 0.76 and 0.78. Similarly, in models of 'household property victimization', the reliability fluctuate between 0.82 and 0.83. Considering that the indicator of reliability can assume values between 0 and 1, outputs over 0.75 can be recognized as in a good level and close 0.9 as very good. Thus, the reliability of the contextual effects in both victimization models are good enough to supported the evidence of these models.

While the incorporation of control variables measured at household level slightly decreases the level 2 variance and the total variance of the violent victimization model (reflected in the ICC), the variance and the ICC of the property victimization model remains almost the same. This means that the household socioeconomic characteristics contribute to explain variations in the prevalence of violent victimization in the whole sample and within neighbourhoods, but not in the case of property victimization. The gain in explained variance by introducing these variables in the victimization model is 7% [(0.131-0.122)*100/0.131]. Nonetheless, the variability of household violent victimization as well as of property victimization are mostly explained by individual or household-effects, rather than neighbourhoods-effects. The potential explanation of this may be that some household-effects and contextual-effects associated with the risk of victimization in Santiago were not estimated in the original dataset or are clustered by local areas differently than the units defined in this study.

Concerning the influence of control variables (M1, Table VII.1), findings of the multilevel regression models are very similar to the findings analysed in the single-level logistic regression models tested in chapter VI (shows in Table VII.1 as 'single level' outputs). Thus, households headed by a woman are associated with a higher risk of violent victimization and also property victimization. More specifically, holding other variables constant, the odds of being a victim of violent crime for a household (or any of its members) where the family head is a woman are higher compared to a household headed by a man. The same association is observed between female household head and property victimization.

In the same sense, the presence of children at home has a positive association with the risk of violent victimization. Thus, the likelihood of suffering violent crime for a household where children are part of the family composition is greater than for a household composed only by adults. This variable is not significantly related to property victimization. This topic was discussed in more detail in Chapter VI.

Regarding the influence of household socio-economic status on violent and property victimization risk, the M1 revealed that only the variables 'Educational level of the household head' and 'Working position of the household head' have a positive association with household violent victimization. By contrast, the variable 'Income dependency' has a positive relationship with household property victimization. The variable relative to family income did not reveal any significant influence in both dependent variables. Those findings confirm the associations observed in logistic-single level regression models tested in Chapter VI.

More specifically, the M1 shows that the odds of being victim of violent crime for a household (or any of its members) where the family head has secondary education is higher compared to a household with a low educated household head (primary education or non-education at all), controlling for other variables. In the same sense, holding all other variables constant, the risk of being victim of violent crime for a member of a family where the household head has higher education is more likely than a household where the household head is low educated. On the other hand, the outputs of M1 also express that the likelihood of being a victim of violent crime for a member of a family where the household head has any active working position (manager, self-employee or employee) is higher than for a member of a family where the household head is an inactive person (retired, student, housewife or incapable of working).

Regarding property victimization, M1 shows that the odds of being a victim of property crime for a household where the level of income dependency is 'high' (typically big families) is greater compared to a household where the level of income dependency is 'very low' (small families), controlling for other families. The same association is observed in households where the income dependency is medium or low rather than in households where the income dependency is 'very low'.

Table VII1. Multilevel Models of Household Violent and Property Victimisation (null model and M1)

	Violent Victimization			Property Victimization		
Multilevel and single level models	Null Multilevel	M1 Multilevel	Single level	Null Multilevel	M1 Multilevel	Single level
Fixed Effects / Variables	Coef.	OR	OR	Coef.	OR	OR
Random intercept	-2.93**	-	-	-3.02**	-	
Female household head (yes)		**1.28***	**1.26***		**1.31***	**1.26***
Presence of children at home (yes)		**1.53****	**1.55****		0.97	0.95
Child's out school (yes)		0.95	0.94		1.10	1.12
Educational level household-head (*ref: Primary & without*)						
Secondary		**1.47****	**1.50****		0.99	1.02
Higher		**1.28**	**1.34**		1.01	1.11
Working position of HH (ref. Inactive)						
Manager		**1.56***	**1.56***		0.97	0.85
Self-employee		**1.90****	**1.78****		1.51*	1.38*
Employee		**1.51****	**1.50***		1.06	1.02
Unemployed		**1.63**	**1.49**		1.53	1.37
New family income (ref.$1961 or +)						
0 - US $490		1.20	1.22		0.78	0.76
$491 – 784		0.95	0.97		0.79	0.76
$785 – 1177		1.26	1.17		1.23	1.07
$1178 – 1960		1.18	1.05		1.14	0.97
Income dependency (ref. very low)						
High level		0.97	0.90		**1.80****	**1.82****
Medium level		1.03	1.03		**1.80****	**1.91****
Low level		0.88	0.87		**1.61***	**1.71****
Irregular dwellings (yes)		1.32	**1.35***		1.23	1.33
Overcrowded house (yes)		0.93	0.91		0.70	0.72
Length of residence (ref. very-high)						
Low (0 - 5.5 years)		**1.60***	**1.60***		1.39	1.40+
Medium (6 - 19.5)		**1.66****	**1.70****		1.32	1.29
High (20 - 35.5)		**1.36**	**1.38+**		1.29	1.25
Random effects						
L2 variance (ψ): Between MN	0.50	0.46		0.65	0.64	
ICC (ρ)	13.1%	12.2%		16.5%	16.3%	
Reliability test	0.78	0.76	-	0.83	0.82	-
Log likelihood	-1331.6	-1240.4	-1256.2	-1302.7	-1241.2	-1267.8
-2 x log likelihood ratio test (a)	-	182.4**	-	-	122.9**	-
Number of obs. / N groups	5,816/242	5630/242	5630	5,845/242	5656/242	5656
Min. obs. per group / Mean	19 / 24	12 / 23	-	20 / 24	12 / 23	-

* p-value < 0.05, ** p-value < 0.01

a) To estimate the -2xLLR test the smaller model (less number of variables) is nested in the larger model.

In sum, confirming the findings of Chapter VI, H2 can be refuted: low household SES is not necessarily associated with a high risk of violent victimization. On the contrary, the influence of 'Education level of household head' and 'Working position' tend to support the idea that the risks of violent victimization are higher among families from middle SES and, indeed, from mid-to-high SES rather than poor families (low-educated and inactive household head). On the contrary, the influence of 'Income dependence' on property victimization leads to believe that middle SES families and mid-to-low SES families face a higher risk of property victimization than wealthier families. Nonetheless, as seen in Chapter VI, the fact that the influence of socioeconomic variables is only significant in neighbourhoods with a high concentration of disadvantages (40% or more of low status population) also reveals that, within a poor neighbourhood, a family with a better economic situation is more likely to become a victim of violent or property crime than a family from the poorest condition. However, this hypothesis should be confirmed in further models where 'Concentration of poverty' at neighbourhood level is incorporated.

Concerning the influence of residential stability, the M1 in Table VII.2 shows that the likelihood of being a victim of violent crime are positively associated with the family's length of residence in the same neighbourhood. Specifically, holding other variables constant, the odds of being a victim of violent crime for a family (and its members) which has lived in the same neighbourhood less than 6 years (low time of residence) are greater than for a family which has lived for 36 years or more in the same area (very long time). In the same way, the likelihood of violent victimization for a family with a medium, indeed, long time of residence is higher compared to a family with a very-long-time of residence. Similarly, the likelihood of being a victim of property crime for a household which has a short, medium or long time of residence is greater than households with more than 36 years of residence; however, those associations are not statistically significant.

Although the associations of the 'irregular status of the house ownership' with violent victimization, as well as with property victimization, are positive, those relations are not statistically significant. Despite this fact, the H3 can be in great part confirmed since the association between the 'Length of residence' and 'Household violent victimization' are very close to the results obtained through the logistic models in Chapter VI. Those findings are also consistent with ecological studies of crime which have demonstrated

that families with a short time of residence have less possibilities to develop ties with their neighbours and, as a result, can be more exposed to violent crime (e.g. Xie and McDowall, 2008).

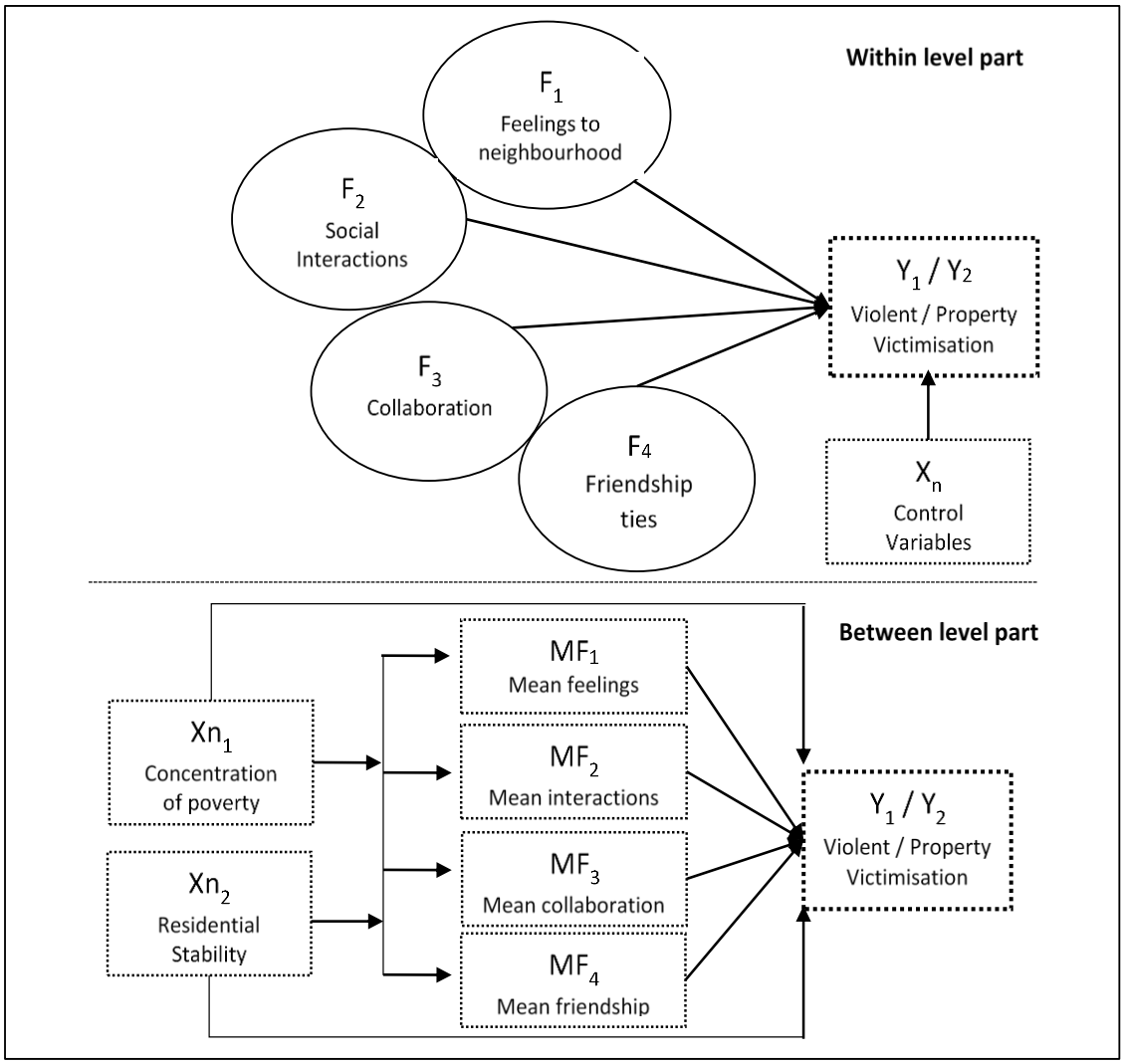
Otherwise, as observed in M1, Table VII.1, models of violent victimization as well as property victimization are well fitted, according to the Log Likelihood Ratio test (-2 x LLR test)[122]. In the two models, the log likelihood improved between null models and M1, and then, the p-values associated with the -2xLLR test are lower than 0.001, rejecting the null hypothesis. In other words, most of the tested variables in M1 are good predictors of the likelihood of victimization by violent and property crimes. As it was noted paragraphs bellow, the reliability test of M1 confirmed that the 'contextual effects' of Santiago neighbourhoods in the two victimization outputs (around or over 0.8) are good enough to support the value of the multilevel models.

VII.2.2. Testing the influence of neighbourhood structural conditions

As represented in the 'between level' part of Figure VII.1, within the context of the 'Social disorganization' theory, the first hypothesis tested (H5) is related to the association of concentration of poverty and residential stability, both at neighbourhood level, with the likelihood of household victimization by violent and property crimes occurring within Santiago neighbourhoods. In order to test this hypothesis two different types of model were analysed: 1) Aggregated-level linear regression models of violent and property victimization rates, and 2) Multilevel random-intercept models; or, more specifically, mixed-effects logistic regression models of both violent and property victimization, measured at household level.

[122] The Log likelihood ratio test (-2 x LLR test) is a statistical test used to compare the fit of two models. The p-value associated with the test allows rejection of the null hypothesis in favour of the alternative hypothesis. To estimate the -2xLLR test the smaller model (fewer number of variables) is nested in the larger model, and when models compared differ in sample size (N) the estimation is produced using the command 'force'.

Figure VII.1. The Systemic Model of 'Social Disorganization' theory



Source: own elaboration based on literature review and hypothesis

Notation:
- Circles represent latent concepts shaped by two or more latent variables (models tested through EFA)
- Squares represent observed variables included in multilevel regression models.
- Arrows represent associations (+ or -) tested through multilevel regression models.

As in classical ecological studies of crime, the first set of models are linear regression models which include dependent and independent variables measured at neighbourhood level. On one hand, the variables of 'Household violent victimization' and 'Household property victimization' were aggregated at neighbourhood level through means estimation. On the other hand, while 'Neighbourhood concentration of poverty' comes from secondary sources of data, the 'Average of residential stability' was estimated

through the neighbourhood; this means both independent predictor variables were tested in regression models.

The outcomes of those models (see Table VII.2) show that the proportion of poor families and the average of residential stability (family length of residence in the same area) are associated with violent victimization rates, but not with property victimization rates. Moreover, while the influence of 'concentration of poverty' on violent victimization is positive or direct, the effect of 'residential stability' is negative or inverse. In other words, holding constant residential stability, a high concentration of poverty is on average associated with high levels of violent victimization rates at neighbourhood level. And on the contrary, low residential stability is on average associated with high levels of violent victimization rates at neighbourhood level, controlling for concentration of poverty. According to the F-test, both explanatory variables of violent victimization are significant. Nonetheless, the capacity of this model to explain the variability of violent victimization rates across neighbourhoods is reduced (R square of 0.03). The model of property victimization is not significant, according to the F-test and the R square.

These findings offer support for the first hypothesis linked to SDT (H5). Based on this result one might think that a person who lives in a neighbourhood with a high concentration of poverty and low residential stability would be more exposed to violent crime than a person who lives in a wealthy and stable area, independent of their individual characteristics. However, such a conclusion might be considered an 'ecological fallacy' in light of the lack of acknowledgment about how victimization can be explained by personal and family characteristics more than neighbourhood characteristics. As aggregated-level models of victimization are not able to explain differences in the risk of victimization within neighbourhoods, multilevel models should be estimated to get a more accurate analysis.

The second set of models (multilevel or mixed-effects regression models) test the macro- to micro-level relationship between neighbourhood structural conditions and victimization outcomes. In these models, both dependent variables were introduced in their original shape at individual level. The two neighbourhood level variables were the same as those

that were involved in previous models: the mean of residential stability and neighbourhood concentration of poverty (see Table VII.3).

Table VII2. Linear regression models of aggregated measures of victimisation

Linear Regression Models of Violent and Property Victimisation Rates (a) (Neighbourhood-level data)				
	Violent Crime		**Property Crime**	
	Estimate	St. error	Estimate	St. error
Constant	-0.002	0.06	-0.003	0.06
Concentration of poverty (a)	0.161**	0.07	0.047	0.07
Average residential stability (a)	-0.154**	0.07	-0.040	0.07
R Square	0.032	6.5	0.002	6.8
F test	3.911	Sig .021	.299	Sig .742
N observations (groups)	242		242	
(a) Original continuous variables were normalized using Z-score transformation. * p-value < 0.05, ** p-value < 0.01				

As observed in Table VII.3, when the two neighbourhood level variables are incorporated into M2, the ICC of the violent victimization model slightly decreases compared with the ICC of the null model (from 13% to 12%). This means that the neighbourhood variables contribute to explain variations in the incidence of violent victimization in the whole sample and within neighbourhoods. The gain in explained variance by introducing these variables is 6%. In the M2 of property victimization, the incorporation of neighbourhood level variables did not produce change in ICC (remains the same between the null model and M2, 16.5%), and in fact, the influence of these variables are not significant. However, the Goldstein reliability test suggests that still the value of the neighbourhood-effects for property victimization is very good (0.83). The value of the *contextual effects* for violent victimization, in the M2, are also good (0.77), with an average cluster size of 23.

The higher concentration of poverty and the lower residential stability, both at neighbourhood level, can be associated with greater risk of 'violent victimization' for families who live in those kind of contexts – according the p-value of z test. In other words, with 95% of confidence and holding constant residential stability, it is possible to confirm that the conditional odds of being a victim of violent crime can be greater for families (and family members) who live in neighbourhoods where the concentration of poverty is, on average, high. By contrast, holding constant concentration of poverty, the likelihood of

being a victim of violent crime is higher for families (and its members) who live in neighbourhoods where the residential stability is low.

Table VII.3. Multilevel models of Household Violent and Property Victimisation based on SDT

	Violent victimization		Property victimization	
Fixed Effects	Null model (coef.)	M2 (OR)	Null model (coef.)	M2 (OR)
Random intercept	-2.93**	-	-3.02**	-
Predictor variables (neighbourhood)				
Concentration of poverty	-	1.21**	-	1.05
Mean of residential stability	-	0.84**	-	0.96
Random effects				
L2 variance (ψ): Between MN	0.50 (0.12)	0.46 (011)	0.65 (0.14)	0.65 (0.14)
ICC (ρ)	13.1%	12.3%	16.5%	16.4%
Reliability test	0.78	0.77	0.83	0.83
Log likelihood	-1331.6	-1327.5	-1302.7	-1302.5
-2 x LLR test (M2-M1/ M3-M2)	-	8.2 (0.02)	-	0.41 (0.8)
Number of obs. / N groups	5,816 / 242	5,816 / 242	5,845 / 242	5,845 / 242
Min. obs. per group / Mean	19 / 24	19 / 24	20 / 24	20 / 24
* p-value < 0.05, ** p-value < 0.01				

In addition, as neighbourhood concentration of poverty is positively and moderately associated with residential stability (~0.4), we can suggest that the poorest local areas which present, on average, high residential stability are not the riskiest areas. Instead, areas from mid-to-low and low socioeconomic status and that have been developed in recent years might express a higher incidence of violent victimization, and then, these residential areas should be the focus of crime prevention policies at the local level. However, in order to confirm these findings, an estimation of interaction terms are required. As this estimation was not addressed in the present thesis, it should be considered in further studies using the same or similar data.

VII.2.3. Testing organisational variables and the 'systemic model of community'

In the Table VII.4, the variables linked to informal networks were introduced in multilevel models with the purpose of testing study hypothesis 6 (H6): '*In neighbourhoods where there is a high concentration of poor families and low residential stability, on average, feelings towards community, friendship ties and informal networks (social interactions and collaboration) will be weak, and as a consequence, the risk of violent victimization*

will be increased but the risk of property victimization will not.' This hypothesis is well represented in Figure VII.1, included at the beginning of this section.

Firstly, the control variables which have been previously tested (in M1) and demonstrated to be significant, were introduced in M3. They are: 'Female household head'; 'Presence of children at home'; 'Educational level of household head'; 'Working position of household head'; 'Income dependency'; and 'Length of residence'. After that, the neighbourhood level variables were also included in that model. As the association between these control variables and both dependent variables - violent and property victimization - remains very similar comparing M1 and M3, the coefficients were not included in Table VII.4. By contrast, the association of neighbourhood level variables with violent victimization decreased when the individual level control variables were introduced. Particularly, the negative relationship between violent victimization and residential stability became non-significant. The fact that the ICC of M3 and M1 are very similar showed that the contribution of the neighbourhood level variables was reduced.

After the incorporation of community-mechanism variables: 'Feelings towards community'; 'Friendship ties'; 'Social interactions' and 'Collaboration', at individual and neighbourhood level, the ICC indicator slightly decreases in both models of violent and property victimization. This suggest that some organisational variables, at individual and neighbourhood level, contribute to explain variations in the incidence of violent victimization, as well as property victimization, in the whole sample and within neighbourhoods. Additionally, the reliability test (by Goldstein et al. 2008) of M4 reveals that the 'contextual effects' of neighbourhoods and of community variables aggregated at neighbourhood level are very good: 0.75 in violent victimization and 0.80 in property victimization models, with an average cluster size of 23.

Although the influence of the tested organisational variables in the variability of victimization is reduced, the Log Likelihood Ratio test (-2 x LLR test)[123] of M4 versus M3 demonstrated that both models of victimization are well fitted. In the two models, the

[123] The Log likelihood ratio test (-2 x LLR test) is a statistical test used to compare the fit of two models. The p-value associated with the test allows rejection of the null hypothesis in favour of the alternative hypothesis.

indicator expresses an improvement in the M4 compared to the M3 (p-value < 0.001), so we can reject the null hypothesis and conclude that some of the tested variables are good predictors of violent and property victimization (see M4 in Table VII.3).

Outcomes of Model 4 (see Table VII.4) revealed that, holding other variables constant, positive respondents' feelings toward their residential area are associated with a low risk of violent victimization. Namely, the likelihood of being a victim of violent crime can be low for a family (and its members) when the perception of 'Feelings toward neighbourhood' is high or increased. In the same way, a higher neighbourhood mean in the 'Feelings toward neighbourhood' is associated with a lower probability of being a victim of violent crime. However, in the case of the aggregated-level measure the association is only significant at 0.1 level, or with 90% of confidence. In the case of property victimization, the same relationship is observed. The risk of being a victim of property crime can be low for a family (and its members) when the perception of 'Feelings toward neighbourhood' is high or increased. The neighbourhood mean of this organisational variable is also negatively associated with the risk of property victimization, but this association is not statistically significant.

Those findings can be interpreted in two ways. When people feel strong attachment toward their residential area, they will probably want to be involved in local networks and in crime prevention initiatives, which tend to reduce the prevalence of violent, as well as property crime. Nonetheless, as the dataset is cross-sectional, the inverse interpretation also can be true. People who live in a household where family members have not been victims of violent or property crimes in their neighbourhood tend to feel more attached to their place, in which case they can be more willing to contribute to common issues. When positive feelings toward neighbourhood are shared by most residents it is probable that collaboration, social cohesion and informal control will be promoted, and in turn, reductions in violence would be achieved.

Table VII. 4. Multilevel models of Household Violent and Property Victimisation based on SDT

	Violent victimization (OR)			Property victimization (OR)		
Fixed Effects (a)	Null	M3	M4	Null	M3	M4
Predictor variables (individual level)						
Feelings toward neighb. (f1)			**0.81****			**0.79****
Social interactions (f2)			0.90			0.88
Collaboration (f3)			**0.81***			1.03
Friendship ties (f4)			1.06			1.13
Predictor variables (neighbourhood)						
Mean feelings toward neighb. (Mf1)			**0.83***			0.91
Mean social interactions (Mf2)			0.86			**0.75***
Mean collaboration (Mf3)			0.94			0.97
Mean friendship ties (Mf4)			1.15			1.14
Concentration of poverty		**1.20***	1.13		1.04	1.07
Mean of residential stability		0.96	0.99		1.06	1.08
Random effects						
L2 variance (ψ): Between MN	0.50	0.43	0.42	0.65	0.62	0.56
ICC (ρ)	13.1%	11.7%	11.3%	16.5%	15.8%	14.6%
Reliability test	0.78	0.76	0.75	0.83	0.81	0.80
Log likelihood	-1331.6	-1246.3	-1229.4	-1302.7	-1253.9	-1240.4
-2 x LLR test (M3-M2/ M4-M3)	-	5.15	33.8**	-	0.9	26.9**
Number of obs. / N groups	5816/242	5670/242	5670/242	5845/242	5696/242	5696/242
Min. obs. per group / Mean	19 / 24	12 / 23	12 / 23	20 / 24	12 / 23.5	12 / 23.5

(a) The most significant control variables (Female household head, Presence of children at home, Working position of household head, Income dependency, and Length of residence*)* were tested in model 3 and subsequent but they were not included in this table and next because their effect was similar than in M1.
* p-value < 0.05, ** p-value < 0.01, + p-value < 0.1.

In a similar sense, the variables of 'Social interactions**'** and 'Collaboration', at individual and neighbourhood level, are also negatively associated with the risk of household violent victimization, but only the variable of 'Collaboration' measured at individual level is statistically significant. This means that the odds of being a victim of violent crime can be reduced for a family (and its members) when the perception of 'Collaboration among neighbours' is, on average, higher or increased. Similar associations are observed with respect to the risk of property victimization. Social interactions among neighbours, measured at individual and neighbourhood level, both have negative influence on the likelihood of household property victimization. However, only the effect of the neighbourhood-mean of social interaction is statistically significant. Thus, the probability of being a victim of property crime can be low for a family (and its members) when they live in a neighbourhood where the level of social interaction is high. By contrast, the influence of 'Collaboration among neighbours' on property victimization is not clear,

because the individual level measure may increase the likelihood of victimization, while the neighbourhood level measure may have the inverse effect. In any case, those associations are not statistically significant.

As a potential interpretation of those findings, it is possible to state that when residents know and frequently interact with their neighbours (greet, talk, make friends or exchange favours), they become more aware of the things happening around them and more vigilant of any attempt of burglary or theft in the local area. In addition, when people feel attached to their residential area and their neighbours, they tend to express more willingness to collaborate with others for the common good. Based on that collaboration, solidarity and union within the neighbourhood can be reinforced, and as a consequence, conflicts between neighbours decrease, and so too does the risk of victimization. However, according to the findings, this kind of association is clearer in the case of violent crime than property crime.

Nevertheless, the inverse interpretation is also possible. People who have been victims of crime often prefer to spend more time at home and restrict the exchange of information with others, while people who have not been victims of crime are more self-confident and trust in others, and so are more willing to collaborate with others and to appreciate the solidarity and reciprocity of the neighbours' acts. Thus, based on findings, an argument which supports the existence of a reciprocal relationship between community mechanisms and victimization within the local context is highly likely to be confirmed.

On the contrary, the influence of the variable 'Friendship ties', which measured the number of relatives and friends living in the same neighbourhood and having frequent contact with the interviewee, on violent victimization and also on property victimization is a positive sign. In addition, the same variable measured at aggregated level 'Mean of friendship ties' also had a positive or direct association with violent and property victimization. In other words, the likelihood of being a victim of violent or property crime can be higher for a household when the level or density of 'Friendship ties' is, on average, higher. Nonetheless, none of these associations are statistically significant.

Based on the previous findings the second hypothesis linked to SDT (H6) may be refused. However, the lack of association between social interactions and violent victimization, and between collaboration and property victimization, in M4, should be treated with caution. Before the estimation of M4 for both dependent variables, multilevel models introducing one predictor latent variable at a time were tested (see Appendix, chapter VII). Results show that feelings toward neighbourhood and social interactions, at household level and neighbourhood level, are associated with violent victimization and property victimization. Collaboration, at household level, is associated with violent victimization but not with property victimization, and at neighbourhood level is associated with property victimization. The latent variable of friendship ties tested separately, instead, has no significant effect on any dependent variable. For this reason, this variable was not included in any further model.

The lack of influence of some variables in M4 could be interpreted as a consequence of the presence of strong collinearity between 'Social interactions' and 'Collaboration', a problem frequently observed in regression models but not always addressed by researchers (see correlation outcomes in Table VII.5 and VII.6). As seen in chapter V, Grewal, Cote & Baumgartner (2004) suggest that when multicollinearity is between 0.6 and 0.8, this relation should be managed because it can have consequences in estimators and measurement errors. In this study, as the goodness-of-fit and the explained variance in most models are weak, a strong collinearity can have relevant effects. Thus, the correlation between 'Social interactions' and 'Collaboration' (F2 & F3), but also the correlation between 'Social interactions' and 'Social cohesion' (F2 & F5F6), both around 0.6, should be managed with caution.

Considering the potential effects of multicollinearity, and choosing with a view to developing parsimonious models, in the next multilevel models only the variable 'Collaboration' was introduced. The variable 'Social interactions' was instead dismissed. In the next models, the variable 'Collaboration' was used to represent the influence of 'Informal networks' on victimization, in the framework of 'Collective efficacy' theory.

Table VII. 5. Correlations between predictor variables at individual level (a, b)

	F1	F2	F3	F4	F5F6	F7	F8	F9	F10
Feelings toward neighbourhood (f1)	1								
Social interactions (f2)	0.36	1							
Collaboration (f3)	0.23	**0.57**	1						
Friendship ties (f4)	0.10	0.29	0.27	1					
Social cohesion (f5f6)	0.39	**0.50**	0.42	0.25	1				
Informal control (f7)	0.16	0.21	0.23	0.14	0.44	1			
Perception of police (f8)	0.18	0.08	0.10	-0.01	0.09	0.07	1		
Perception of municipality (f9)	0.25	0.15	0.22	0.07	0.22	0.14	0.32	1	
Police-community nexus (f10)	0.04	0.07	0.16	0.09	0.07	0.08	0.19	0.19	1

(a) All correlations in this table are significant at 0.001 level (or 99.9%), except the associations between 'friendship ties' (f4) and 'perceptions of police' (f8), highlighted with blue.
(b) The values in light grey cells represent strong correlations (between 0.5 & 0.8), in these cases models' estimates should be looked with cautions because there is risk of collinearity.

Table 6. Correlations between predictor variables at neighbourhood level (a, b)

	MF1	MF2	MF3	MF4	MF5F6	MF7	MF8	MF9	MF10
Mean of feelings toward neighbourhood (f1)	1								
Mean of social interactions (f2)	0.37	1							
Mean of collaboration (f3)	0.12	**0.57**	1						
Mean of friendship ties (f4)	0.05	0.25	0.37	1					
Mean of social cohesion (f5f6)	**0.57**	**0.52**	0.42	0.29	1				
Mean of informal control (f7)	0.22	0.06	0.10	0.16	0.43	1			
Mean of perception of police (f8)	0.29	-0.10	-0.04	-0.10	-0.02	0.04	1		
Mean of Perception of municipality (f9)	0.36	0.04	0.19	0.09	0.21	0.13	**0.51**	1	
Mean of police-community nexus (f10)	-0.01	0.00	0.45	0.10	0.03	0.01	0.33	0.22	1

(a) All correlations in this table are significant at 0.001 level (or 99.9%), except the associations between 'Perception of police' (f8) and 'Social Cohesion' (f5f6), highlighted with blue.
(b) The values in light grey cells represent strong correlations (between 0.5 & 0.8), in these cases models' estimates should be looked with cautions because there is risk of collinearity.

In sum, the evidence analysed until this point demonstrates that three of the four variables tested - 'Feelings toward neighbourhood'; 'Social interactions'; and 'Collaboration' - are associated with violent victimization, and some of them also with property victimization. Thus, the H6 has been in most part confirmed. Nonetheless, as Sampson et al. (2003) assert, the organisational or community mechanisms do not emerge in a void. These variables are differentially distributed across diverse types of neighbourhood because they depend on the structural conditions present in each local context.

In this study, two structural variables were tested: 'Concentration of poverty' and 'Residential stability'. Therefore, the influence of these structural variables on organisational mechanisms is, in part, proved when the organisational variables are introduced in M4, and, consequently, the influence of 'Concentration of poverty' on victimization decreases. However, the influence of 'Residential stability' on violent or property victimization was not proved, thus based on previous findings the SDT only can be partly supported.

In order to test the potential mediator role of organisational variables, in the relationship between structural conditions and victimization variables, a multilevel model containing these variables as dependent variables was computed (see Table VII.7).

The mediator role of 'Informal Networks' variables

Multilevel models of organisational variables show that variations in 'Feelings toward neighbourhood', 'Social Interactions' and 'Collaboration' are in great part explained by differences between neighbourhoods (Community level effects) - ICC: 25%, 22% and 35%, respectively. In contrast, the variations in 'Friendship ties' explained by neighbourhood effects reduces, to an ICC of 11%. Consequently, the Goldstein reliability test for the first three variables are very good (0.89, 0.87 and 0.94, respectively), in the last variable the reliability test is lower than the previous but this is still in a good level (0.75). Those outputs suggest that the 'contextual effects' of neighbourhoods significantly affect the variability of these four community variables, linked to the concept of informal networks.

Despite this fact, only the first variable, 'Feelings toward neighbourhood', is strongly associated with the two structural variables at neighbourhood level, and 'Friendship ties' is only influenced by concentration of poverty, while the other two variables are not influenced by either neighbourhood structural variables (see Table VII.7).

'Feelings toward neighbourhood' and 'Friendship ties' are significantly influenced by the 'Concentration of poverty'. However, while a high concentration of poverty is associated with low levels of feelings toward the residential area, the same structural variable is

associated with high levels of friendship ties. Social interactions and collaboration among neighbours also have a positive association with concentration of poverty, but these associations are not significant. In contrast, although the average residential stability at neighbourhood level has a positive effect on the four organisational variables, only the association with feelings toward neighbourhood is significant. Therefore, the causal channels between neighbourhood structural variables and violent victimization could be interpreted in the following way.

Holding other variables constant, in neighbourhoods with a high concentration of poverty people tend to feel low attachment to the local area and, therefore, they will not be willing to be involved in formal/informal networks, to exert informal control actions or to take part in crime prevention initiatives. In the same sense, families who live in areas where the average residential stability is low also express low feelings toward their neighbourhood, and in this scenario, they prefer to stay at home rather than to be involved in community activities such as informal control initiatives. Therefore, the risk of victimization by violent crime for families with low or negative feelings toward their neighbourhood can be higher than for families who feel a high attachment to their local area.

Table 7. Mixed-effects linear models of Mediating Variables (Coefficients)

Predictor variables (a)	Feelings toward neighbourhood	Social Interactions	Collaboration	Friendship ties
Fixed effects / Neighbourhood level				
Concentration of poverty	-0.25**	0.05	0.06	0.06*
Mean of residential stability	0.19**	0.05	0.02	0.05+
Intercept	0.23**	0.17**	0.20**	-0.13*
Random effects				
ICC (ρ)	25.3%	21.6%	35.1%	11.4%
Reliability test	0.89	0.87	0.93	0.75
Number of obs. / N groups	5,688 / 242	5,688 / 242	5,688 / 242	5,688 / 242
Min. obs. per group / Mean	12 / 23	12 / 23	12 / 23	12 / 23

a) Control variables were tested in these models but they were not included in the table.
* p-value < 0.05, ** p-value < 0.01, + p-value < 0.1.

In neighbourhoods with a high concentration of poverty and low residential stability, in contrast, residents have denser friendship ties, express more frequent interactions and/or develop more collaborative actions with their neighbours, than in those areas with low concentrations of poverty. However, those associations are mostly reduced and not

statistically significant. As was observed in previous models, while interaction and collaboration can contribute to decrease the risk of household victimization (by violent and property crimes), the influence of dense friendship ties can increase the risk of victimization, although this association is not statistically significant. This contradictory finding suggests that the SDT hypotheses are not confirmed in the context of Santiago neighbourhoods. The tested variable of 'Feelings toward neighbourhood', negatively associated with poverty and positively associated with residential stability, is the only exception to partially support the H6. Thus, the channel between concentration of poverty, informal networks and household victimization cannot be considered as an explanation of the higher risk of violent victimization in poor areas of Santiago.

VII.2.4. Summary of hypothesis test: H5 and H6

In synthesis, previous findings contribute to partially support hypothesis 5 associated with SDT (H5): *In neighbourhoods where there is a high concentration of poor families (from working class and lower socioeconomic status) and the average of residential stability is low, violent victimization risk will be higher, but not the risk of property victimization*. However, when control variables at household level are considered, the influence of the average residential stability disappears. Nonetheless, the most relevant finding concerning this hypothesis is that the variability of household victimization by violent and property crimes can only be attributed to neighbourhood characteristics (macro-level effects) in a small proportion. Thus, the major portion of the variability of those variables depends on individual-household level variables.

Concerning H6, those variables representing the 'Social organisation' link, measured at individual and neighbourhood level, have a similar negative association with both dependent variables, with the exception of 'Friendship ties'. Actually, the difference in the effects of social interactions and collaboration is, apparently, a result of the collinearity problem rather than representing a substantial difference. The promotion of these organisational mechanisms can be associated with a lower risk of victimization at household level. By contrast, a strong density of friendship ties tends to be associated with a higher risk of victimization, although this relationship is not statistically significant. However, those community resources are not produced in a void; they depend on neighbourhood structural conditions.

As the findings have suggested, in neighbourhoods where there is a high concentration of poor families, people's feelings toward their residential area tend to be low, which in turn will increase the risk of violent and property victimization. In the same way, low residential stability at the aggregated level is associated with low or negative residents' feelings toward neighbourhood and a higher risk of victimization. Although the other three organisational variables are not strongly associated with any structural variable, those relationships are positive. Then, in Santiago neighbourhoods of high concentrations of poverty and/or low residential stability the informal networks tend to be dense and with frequent interactions. Those trends do not respond to the theoretical hypotheses.

Although poor and unstable neighbourhoods offer the worst scenario for the risk of violent victimization, a great part of the problem's explanation depends on individual level effects, and their causal channels are still unclear. As the weakness of social organisation in neighbourhoods with adverse structural conditions is not straightforward, neither is the influence of these mechanisms on the rise of violent victimization. For instance, in neighbourhoods with a high concentration of poverty people tend to express negative feelings toward their residential area, but are still willing to interact and collaborate with others. This effect could be thought to counteract the previous one on the risk of violent victimization. And, even in poor neighbourhoods, people who have lived there for a long time can have, on average, higher levels of social interactions and collaboration, and then a lower risk of victimization. Thus, the evidence previously analysed is not enough to support SDT.

VII.3. Collective Efficacy Model for Explaining Violent and Property Victimization

VII.3.1. Testing the influence of social cohesion and informal control

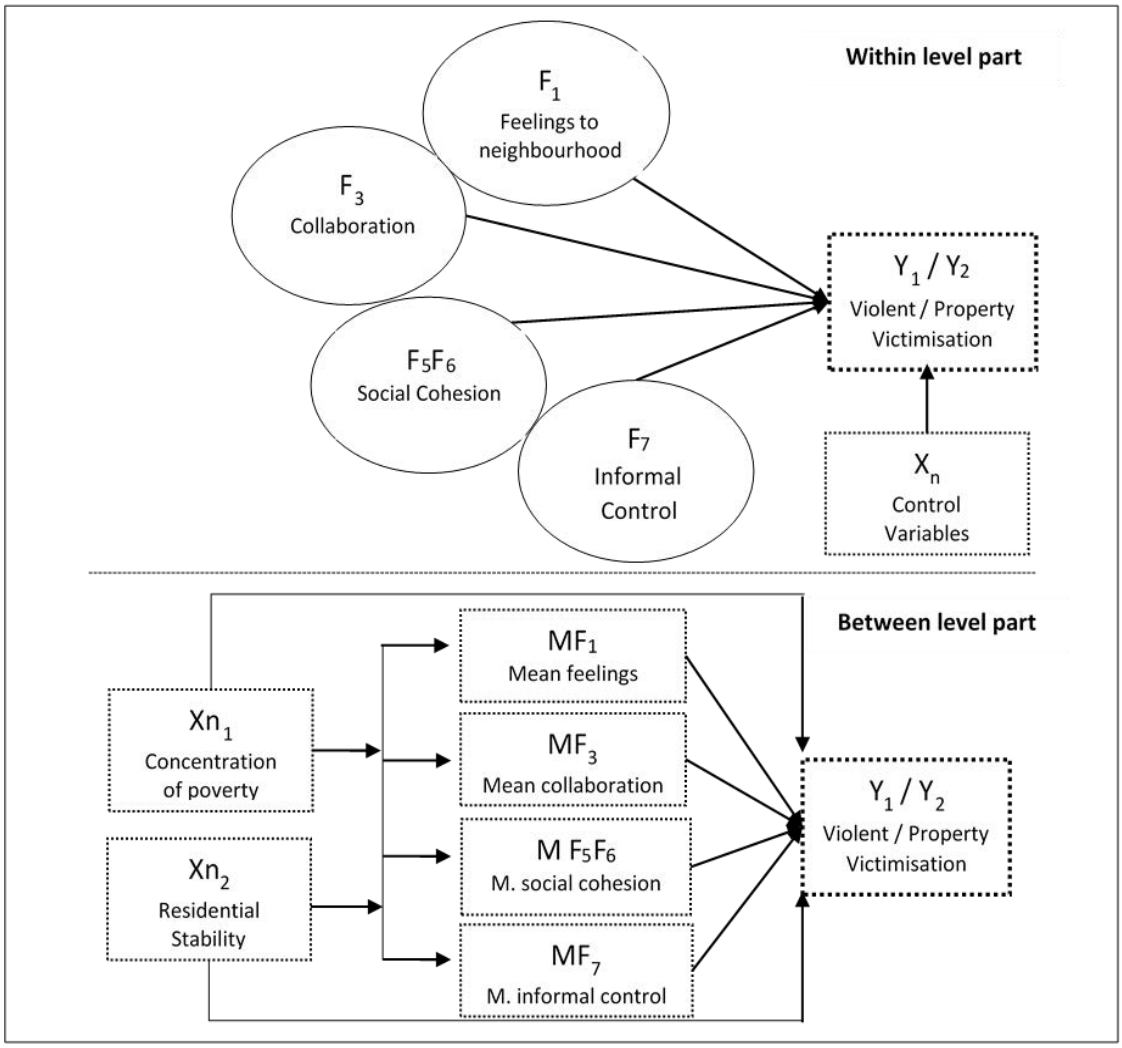
Based on the framework of the 'Collective Efficacy' model (CEM), the hypothesis about the inverse or negative influence of Social Cohesion and Informal Control, at individual level, on the risk of household violent and property victimization is tested - represented in the 'within part' of Figure VII.2. Consequently with findings of chapter V, the concept of 'Collective efficacy' cannot be defined through the combination of 'Trust, Union and Informal control'; on the contrary, two different but correlated factors emerged: 'Social cohesion' (composed by 'Trust and union') and 'Informal control'. Besides, the reduced presence of these community mechanisms in neighbourhoods characterised by a high concentration of poverty and low residential stability is also tested - represented in the 'between' part of Figure VII.2. In sum, hypothesis 7 (H7) states: *'In neighbourhoods where there is a high concentration of poor families and low residential stability, on average, social cohesion and informal control will be weak, and as a result, the risk of violent victimization will be increased but the risk of property victimization will not.*'

In model 5 (M5), two variables previously tested were incorporated: Feelings toward community and Collaboration, at individual and neighbourhood level. In this model, the explanatory variables keep the same influence (in direction and significance) as in the previous model (M4). After that, in model 6 (M6), the two variables concerning the CEM were tested: Social cohesion and Informal control. Later, in model 7 (M7), these four explanatory variables were tested together (see Table VII.8).

The ICC indicator of M5 and M6 is significantly lower compared to the ICC of the null models, for violent victimization (null: 13.1%, M5: 11.8%, M6: 11.5%), as well as for the property victimization model (null 16.5%, M5: 15.4%, M6: 15.6%). However, the main part of these reductions is explained by the introduction of control variables in M1. Besides, there are no strong differences in the ICC between M6 and M7. In other words, the variables regarding the 'Collective Efficacy' model can contribute to explain the variability of violent and property victimization in the whole sample - the influence of the individual

level variables - but only in a reduced proportion for the variability between neighbourhoods, i.e. the influence of neighbourhood level variables. Even though, the Goldstein reliability test of M5, M6 and M7, for both victimization variables, remains similar than in prior models (0.75 in violent victimization models and 0.81 in property victimization models). Thus, those outputs suggest that the 'contextual effects' of organizational variables aggregated at neighbourhood level are good to support the evidence, particularly in the case of the influence of 'Social Cohesion'.

Figure VII. 2. 'Collective Efficacy' Model



The Log Likelihood Ratio test (-2 x LLR test) of M7 versus M6 demonstrated that both models of victimization are well fitted (p-value < 0.001) and revealed an improvement in tested models, suggesting that some of the tested variables in M7 are good predictors of violent and property victimization (see M7 in Table VII.8).

The findings of M6 (Table VII.8) expressed that 'Social cohesion' and 'Informal control' are negatively associated with violent victimization. However, while the effect of social cohesion, measured at individual and neighbourhood levels, is statistically significant with 99% of confidence, the influence of informal control is only significant at individual level and with 90% of confidence. In the case of property victimization, only the influence of social cohesion, at the individual and neighbourhood level, is negative and statistically significant (99% of confidence).

More specifically, holding other variables constant, the likelihood of being a victim of violent crime can be low for a family (and its members) when the perception of 'Social cohesion' is high or increased (M6 in Table VII.8). In the same way, a higher neighbourhood mean of 'Social cohesion' is associated with a lower probability for families being victims of violent crime. Regarding property victimization the same relationship is observed. The risk of being a victim of property crime can be low for a family (and its members) when the perception of 'Social cohesion' is high or increased. The neighbourhood mean of this community mechanism is also negatively associated with the risk of property victimization.

Concerning the influence of 'Informal control', this variable is negatively or inversely associated with violent victimization. This means that the likelihood of being a victim of violent crime can be low for a family (and its members) when the perception of 'Informal control' is high or increased, controlling for other variables (M6 in Table VII.8). The higher neighbourhood mean of 'Informal control' is also associated with a lower probability of violent victimization, but this association is not statistically significant. On the contrary, the association between informal control and property victimization is positive, at individual and neighbourhood level. Nonetheless, those associations are not statistically significant.

Table 8. Multilevel models of Violent and Property Victimisation based on CET hypothesis

	Violent victimization (odds ratio)			Property victimization (odds ratio)		
Fixed Effects (a)	M5	M6	M7	M5	M6	M7
Predictor variables (individual level)						
Feelings toward neighbourhood (f1)	0.80**	-	0.83**	0.78**	-	0.81**
Collaboration (f3)	0.78**	-	0.83*	0.99	-	1.05
Social cohesion (f5f6)	-	0.81**	0.91+	-	0.79**	0.82*
Informal control (f7)	-	0.86+	0.87	-	1.09	1.09
Predictor variables (neighbourhood)						
Mean feelings toward neighbourhood (Mf1)	0.79**	-	0.86+	0.83*	-	0.84
Mean collaboration (Mf3)	0.91	-	0.98	0.87	-	0.90
Mean social cohesion (f5f6)	-	0.78**	0.83*	-	0.78**	0.88+
Mean informal control (f7)	-	0.94	0.94	-	1.12	1.10
Concentration of poverty	1.12	1.16	1.11	1.02	1.02	1.02
Mean of residential stability	1.00	1.00	1.01	1.09	1.11	1.11
Random effects						
L2 variance (ψ): Between MN	0.44	0.43	0.43	0.60	0.61	0.59
ICC (ρ)	11.8%	11.5%	11.6%	15.4%	15.6%	15.3%
Reliability test	0.76	0.75	0.75	0.81	0.81	0.81
Log likelihood	-1231.6	-1234.0	-1227.0	-1245.3	-1247.2	-1241.8
-2xLLR test (M5-M3 / M6-M3/ M7-M6)	29.4**	24.5**	14.02**	17.2**	13.4**	10.7*
Number of obs. / N groups	5670/242	5663/242	5663/242	5696/242	5689/242	5689/242
Min. obs. per group / Mean	12 / 23	12 / 23	12 / 23	12 / 23	12 / 23	12 / 23

(a) Control variables were tested in model 6 and subsequent but they were not included in this table or next because their influence was in great part (direction and significance) the same than in previous models.
* p-value < 0.05, ** p-value < 0.01, + p-value < 0.1

Previous findings can be interpreted in two ways. When people feel part of a community where residents are united and share similar normative frameworks, they are willing to collaborate with others and do things aimed at protecting the common good (e.g. crime prevention initiatives). However, the inverse argument is also possible. People who have not suffered victimization (by violent or property crime) often perceive more solidarity and union among neighbours. The most relevant issue is that, when social cohesion becomes a collective mechanism shared by the majority of residents, it is more likely that conflicts among neighbours will decrease and preventive initiatives be promoted.

In the same way, higher levels of informal control may decrease the risk of violent victimization, but not the risk of property victimization. Thus, when people are willing to intervene in conflict encounters or anti-social behaviour, the probability of violent crime tends to decrease. Although this finding is consistent with 'Collective efficacy' studies, it

is necessary to highlight that these two mechanisms are associated but are not part of a single construct. As Triplett et al. (2005) point out, the strength of social ties necessary to develop informal control is conceptually different to the exercise of these controls. Topic which was previously discussed in chapter V.

Returning to the results, in M6 it can also be observed that after the introduction of 'Social cohesion' and 'Informal control' the effect of concentration of poverty decreases, becoming non-significant, compared to previous models where control variables and structural neighbourhood variables were included (M3). This evidence tends to support H7, particularly concerning the fact that social cohesion and informal control mediate, in a large proportion, the negative effect of neighbourhood structural conditions on violent victimization. Nonetheless, in order to confirm this hypothesis a model having these mediating variables as dependent variables should be estimated; this will be analysed in the next section.

After incorporating the previously tested variables, 'Feelings toward neighbourhood' and 'Collaboration' in model 7 (M7), the influence of 'Social cohesion' decreases and becomes only significant at the level 0.1 (90% of confidence), in the case of 'Informal control' their influence decreases and becomes insignificant. The loss of influence of 'Social cohesion', especially in the case of the neighbourhood mean, can be in part explained by the strong collinearity observed between this variable and the variable 'Feelings toward neighbourhood' (around 0.6), which also decreases significance in M7. Those findings suggest that the evidence supported by 'Collective efficacy' studies (Sampson et al., 1997; Morenoff et al., 2001; Sampson, 2012), in which the authors found that the incorporation of the 'Collective efficacy index' in hierarchical regression models tended to eliminate the influence of 'organisational variables' on violent victimization, was not confirmed in the context of Latin American neighbourhoods. Based on that, they argued that dense informal networks are not required to enact social controls, within a local context (Morenoff et al., 2001). On the contrary, the results of the present study suggest that after the incorporation of 'Social cohesion' and 'Informal control' into model, the influences of some 'organisational variables' are still significant.

The potential explanation of this finding can be related to the characteristics of poor neighbourhoods in Santiago, as we saw in the theoretical chapter about neighbourhood definition. To differentiate from poor Chicago areas, where the SDT was born, in most Latin-American poor neighbourhoods residential stability are often high and, as a result, friendship ties, interactions and collaboration among neighbours are dense and frequent.

As Valenzuela and Cousiño (2000) explain, in Chilean neighbourhoods trust and sociability among residents emerged from the 'familiarity' or 'closeness' involved in each relationship. By contrast, the possibility of building sustainable associations is reduced because they required '*trust in strangers'* and most residents of poor areas commonly distrust 'others'. Thus, even in areas of dense informal networks, social cohesion and informal control are not ensured, and it is even more difficult to promote in contexts of high-crime and insecurity, where perceptions of distrust are generalised. Despite this, as the findings of this study show, strong community attachment and collaboration (at individual level) can reduce victimization risk, even after incorporating the influence of social cohesion and informal control.

VII.3.2. The mediator role of social cohesion and informal control

The multilevel model of social cohesion and informal control (Table VII.9) suggests that neighbourhood concentrations of poverty are negatively associated with 'Trust' and 'Union', and then with 'Social Cohesion'. By contrast, the mean of residential stability is positively associated with these three variables. In other words, while a high concentration of poverty influences or decreases perceptions of social cohesion, high residential stability is associated with strong social cohesion among neighbours. Informal control, on the other hand, is negatively associated with both structural variables, but these relationships are not significant; so this variable cannot be considered as a causal channel between structural conditions and crime victimization.

Despite that findings, the variability of informal control can be largely attributed to differences between neighbourhoods (ICC: 41%), even more than to social cohesion, which also is explained, in a notable proportion, by neighbourhood characteristics (ICC 21%). In addition, the Goldstein reliability test for both Social Cohesion and Informal

Control are very good (0.86 and 0.94, respectively). Those outputs suggest that the 'contextual effects' of neighbourhoods significantly affect the variability of these organizational variables. The mediator role exerted by social cohesion in the relationship between structural variables and both type of victimization could be interpreted as follows.

Holding other variables constant, in neighbourhoods with a high concentration of poverty people tend to feel low levels of trust, solidarity and union among neighbours in the local area and, therefore, they will be unwilling to collaborate with others in community issues or take part in crime prevention initiatives. As a result, they may suffer from a higher risk of victimization by violent crime and/or property crime than people who perceive strong social cohesion and develop efforts to collaborate with others. By contrast, people who live in areas where the average residential stability is low can also perceive weak social cohesion in their neighbourhood, and, as a result, can also suffer from a high risk of violent and/or property victimization. When social cohesion is collectively shared by a great number of neighbours it can become a community mechanism, having additional impact on victimization risk. As 'Social cohesion' and 'Informal control' are moderately correlated variables, a positive change in one of them can contribute to change results in the other, and can then multiply favourable preventive behaviour among neighbours.

Table 9. Mixed effects linear models of Mediating Variables (Coefficients)

Predictor variables (a)	Trust	Union	Social cohesion	Informal Control
Fixed effects / Neighbourhood level				
Concentration of poverty	-0.14**	-0.08*	-0.11**	-0.04
Mean of residential stability	0.13**	0.13**	0.14**	-0.03
Intercept	0.10	0.16	0.14*	0.01
Random effects				
ICC (ρ)	20%	20%	21%	41%
Reliability test	0.86	0.85	0.86	0.94
Number of obs. / N groups	5640 / 242	5640 / 242	5,640 / 242	5,640 / 242
Min. obs. per group / Mean	12 / 23.5	12 / 23.5	12 / 23	12 / 23

(a) Models were estimated considering control variables, but they were not included in this table.
** p-value < 0.01, * p-value < 0.05 (+ p-value < 0.1)

In a recent analysis made with the same dataset but a different statistical approach, Structural Equation Multilevel models (SEM), these findings were partly confirmed although in some cases in a moderated way (See models outputs in Appendix 5 of

Chapter VII). SEM models of violent victimization and property victimization, including Collaboration, Social Cohesion and Informal Control, were tested, and those outputs show that the three variables exert an inverse influence on violent victimization, when they are measured at individual level. Only, the neighbourhood mean of Social Cohesion have a negative influence on violent victimization, decreasing the risk of this type of victimization, within the residential context. In the case of property victimization, the outputs suggest that only the association with Social Cohesion, at individual level, is significant, contributing to diminish the risk for families of being victims of this type of crimes (see M8 and M10 in table 5, in Appendix 5).

Furthermore, as is observed in M11 (table VII.12), when direct and indirect effects of neighbourhood structural variables on violent and property victimization are tested, can be confirmed that only Social Cohesion is negatively associated with household **violent victimization**, at individual level and neighbourhood level. This variable is, apparently, one of the main channel which mediate the direct effects of 'Concentration of Poverty' on violent victimization. By contrast, although Social Cohesion at individual level have also an inverse effect on property victimization, the Mean of social cohesion do not exert a significant influence on property victimization. In the case of informal control there was not proved any significant association with violent or property victimization (see M11 in table VII.12).

As it is observed in the mediating part of the SEM model, both structural variables are significantly associated with Social Cohesion, but not with Informal Control. Thus, when Concentration of Poverty are higher within neighbourhoods, the level of Social Cohesion are lower or decrease. On the contrary, when the Mean of Residential Stability is higher, the level of Social Cohesion tend to be higher or increase. In addition, in this SEM model was also suggested that after the incorporation of these organizational variables in models, the direct effects of Concentration of Poverty on violent victimization become non-significant. The influence of Residential stability was only significant in the initial SEM models, but it become non-significant after the inclusion of control and organizational variables. Consequently, just the indirect effect of Concentration of Poverty are confirmed, and apparently, the main mediating channel is the variable of Social Cohesion.

Thus, the hypothesis linked with 'Collective Efficacy' theory are not confirmed in this study of Santiago neighbourhoods.

Despite that findings, it is worthy to notice that even when in SEM models the average cluster size is the same than in previous models (23 or 24), the reliability test of the contextual effects were lower than in those models. In the case of violent victimization the indicator was around 0.4, and in property victimization models the indicator was around 0.5. For that reason, it is possible to argue that the SEM models was not the best approach to test the thesis hypothesis.

VII.3.3. Summary of hypothesis test: H7

Previous findings only partially support H7, because only the presence of 'Social cohesion' (at individual and neighbourhood level) contributes to explain reductions in household victimization, but the influence of this effect is similar in violent victimization as well as property victimization. In fact, when organisational variables (feelings and collaboration) were incorporated into M7 the influence of 'Social cohesion' on violent victimization became less relevant, and the influence of 'Informal Control' became non-significant. In M7 only the influence of social cohesion at individual level on violent and property victimization remains significant, and also the influence of the Mean of Social Cohesion on violent victimization.

Those findings contradict evidence from international studies. According to Rhineberger-Dunn and Carlson (2011), for instance, while informal control has a stronger impact than formal control on violent victimization, this effect is less important in the case of property victimization. As the authors explain, people are more likely to intervene in violent crime because the act creates a direct interaction between victim and offender, and the offender is commonly an acquaintance of the victim. Instead, in property crimes offenders are usually unknown and people think that the police are better equipped to deal with this crime.

Nonetheless, as is hypothesised, the strong correlation between 'Feelings toward neighbourhood' and 'Social cohesion', particularly at neighbourhood level, seems to be the main reason to explain the reduction in the level of influence of both variables ('Social

cohesion' and 'Feelings') on violent and property victimization. Based on that, it is possible to argue that after eliminating this 'multicollinearity' effect, the effect of 'Social Cohesion' on both victimization variables is still relevant. Even though, it can equally be stated that this evidence only partially supports the hypothesis, because informal control (on any level), is not significantly associated with violent or property victimization, and there is no risk of multicollinearity regarding this variable. As 'Informal control' is the core variable in the model of 'Collective efficacy' theory, and also in SDT, this finding allows us to refuse such theories. Particularly, 'Social Cohesion' and 'Informal Control' did not eliminate the effect of organisational variables, and those variables still exert an independent effect in the reduction of violent victimization. Thus, based on that, it is possible to state that it is the concurrence of these community mechanisms, rather than the predominance of one of them over the others, which will on average reduce the risk of violent victimization within neighbourhoods.

In addition, as the structural variables of 'Concentration of poverty' and 'the Mean of Residential stability' only have a significant influence on violent victimization, and on the sense of social cohesion, just the mediator role of this last variable can be confirmed. This finding was also observed in the analysis of SEM models, testing direct and indirect effects. Based on that evidence can be suggested that social cohesion may act as a mediator in the relationship between neighbourhood concentration of poverty and violent victimization.

VII.4. 'New Parochialism' Model for Explaining Violent and Property Victimization

VII.4.1. Testing the influence of public control variables

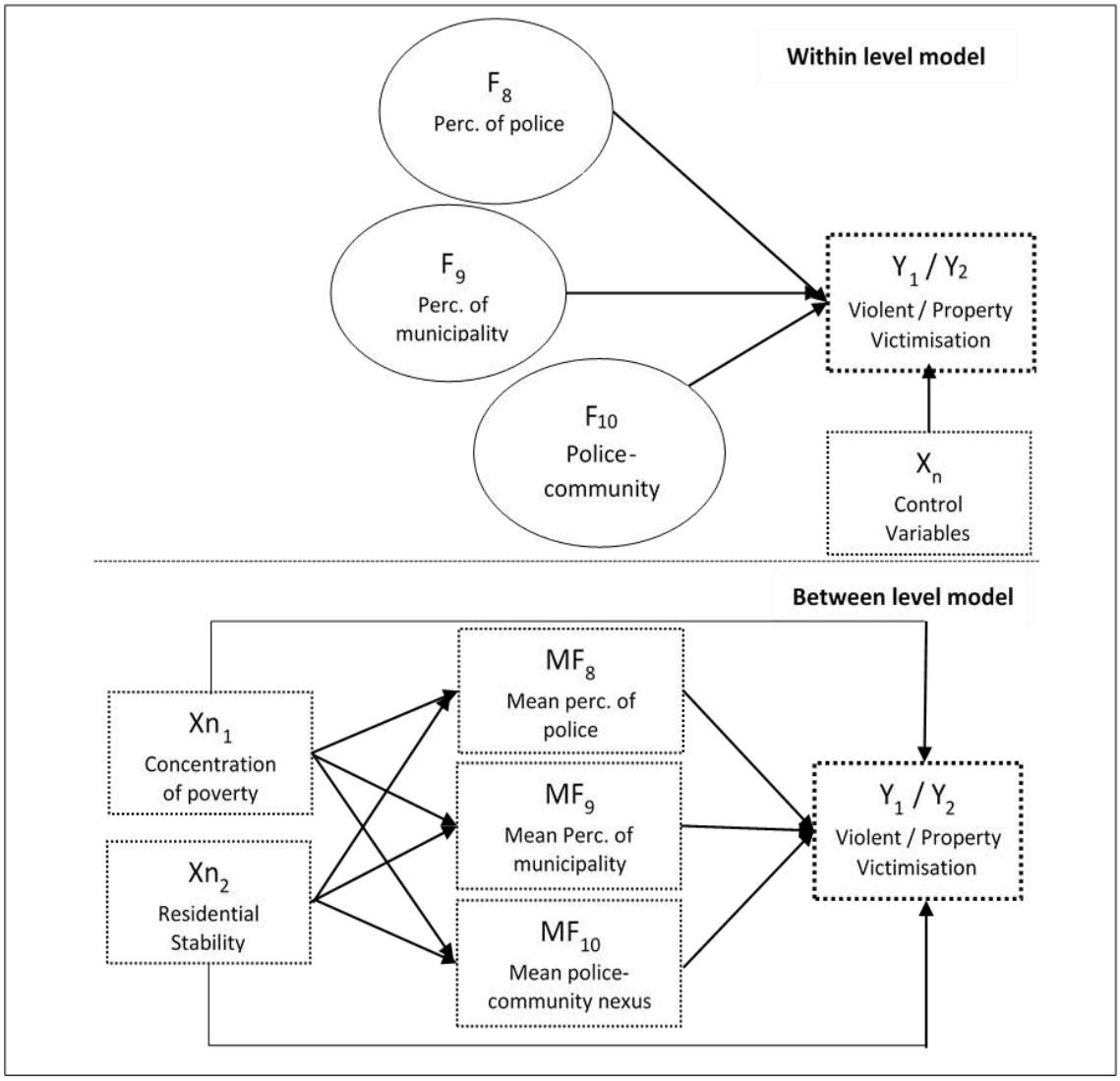
Based on ecological studies of crime which highlight the influence of citizens' satisfaction with public control institutions on the risk of victimization, the study hypothesis 8 (H8) involves testing the inverse or negative association of the 'Perceptions of police', 'Perceptions of municipality services' and 'Perceptions of police-community nexus', with violent and property victimization - represented in the 'within part' of Figure VII.3. Besides, the negative association between the neighbourhood structural variables (concentration of poverty and the mean of residential stability) and the aggregated level of those community mechanisms is also tested - represented in the 'between part' of the Figure VII.3. In sum, H8 states: '*In neighbourhoods where there is a high concentration of poor families and low residential stability, on average, perceptions of police and perceptions of municipality will be negative, and the police-community nexus will be weak, and as a consequence, the risk of violent victimization will be increased but the risk of property victimization will not.*'

In model 8 (M8), three variables previously tested were incorporated: 'Collaboration', 'Social cohesion' and 'Informal control', at individual and neighbourhood levels. In M8 those variables maintain similar influence (in direction and significance) to previous models (M5-M6-M7). After that, in model 9 (M9), the three variables concerning 'Public Control' were tested: 'Perceptions of police', 'Perception of municipality' and 'Police-community nexus'. Later, in the model 10 (M10), these six explanatory variables, at individual and neighbourhood level, are tested together (see Table VII.10).

The ICC indicator of the M9 is slightly lower than the ICC of M8, in the case of violent victimization, and it is almost the same between M9 and M8 in the case of property victimization. However, the reduction in the ICC is most clear between M8 and M10 for violent victimization, as well as for property victimization. Thus, in the last model can be appreciated that the variables regarding to 'Public control' hypothesis, in a significantly way, contribute to explain the variability of violent and property victimization in the whole sample and between neighbourhoods. Confirming this finding, the Goldstein reliability

test (by Goldstein et al. 2008) of M8, M9 and M10 reveals that the 'contextual effects' of neighbourhoods and of 'Public control' variables aggregated at neighbourhood level are very good: 0.75 in violent victimization and 0.81 in property victimization models, with an average cluster size of 23.

Figure VII. 3. Public Control Model



Source: own elaboration based on literature review and hypothesis

Notation:
- Circles represent latent concepts shaped by two or more latent variables (models tested through EFA)
- Squares represent observed variables included in multilevel regression models.
- Arrows represent associations (+ or -) tested through multilevel regression models.

* Control variables at household level are: female household head; presence of child at home, educational level of the household head; family aid; irregular dwellings and length of residence (recoded into groups).

Besides, the Log Likelihood Ratio test (-2xLLR test) of M10 versus M8 demonstrated that victimization models improved with the incorporation of 'public control' variables, so most of the tested variables in M10 are good predictors of victimization.

Table VII. 10. Multilevel models of Violent and Property Victimisation based on Public Control hypothesis

	Violent victimization (odds ratio)			Property victimization (odds ratio)		
Fixed Effects (a)	M8	M9	M10	M8	M9	M10
Predictor variables (individual level)						
Collaboration (f3)	0.81**	-	0.83*	1.02		1.04
Social cohesion (f5f6)	0.87+	-	0.89	0.78**		0.79**
Informal control (f7)	0.87	-	0.87+	1.09		1.08
Perception of police (f8)	-	0.83**	0.84*		0.87*	0.88+
Perception of municipality (f9)	-	0.84*	0.91		0.92	0.95
Police-community nexus (f10)	-	1.12+	1.15*		1.12+	1.13+
Predictor variables (neighbourhood)						
Mean collaboration (Mf3)	0.97	-	0.88	0.89		0.78*
Mean social cohesion (f5f6)	0.79*	-	0.82*	0.83+		0.88
Mean informal control (f7)	0.94	-	0.93	1.10		1.09
Mean perception of police (Mf8)	-	0.81*	0.79*		0.89+	0.85
Mean perception municipality (Mf9)	-	0.94	1.03		0.91	0.98
Mean police-community nexus (Mf10)	-	1.23*	1.27*		1.18+	1.34*
Concentration of poverty	1.15	1.16	1.14	1.04	1.01	1.06
Mean of residential stability	1.00	0.97	1.01	1.09	1.07	1.09
Random effects						
L2 variance (ψ): Between MN	0.43	0.42	0.41	0.60	0.60	0.55
ICC (ρ)	11.6%	11.2%	11%	15.3%	15.4%	14.4%
Reliability test	0.75	0.75	0.75	0.81	0.81	0.80
Log likelihood	-1230.5	-1235.5	-1222.6	-1246.1	-1249.0	-1240.2
-2xLLR test (M8-M3/M9-M3/M10-M8)	31.5**	21.5**	16.0*	15.6*	9.8	17.7*
Number of obs. / N groups	5663/242	5670/242	5663/242	5689/242	5696/242	5689/242
Min. obs. per group / Mean	12 / 23	12 / 23	12 / 23	12 / 23	12 / 23	12 / 23

(a) Control variables were tested in model 6 and subsequent but they were not included in this table or next because their influence was in great part (direction and significance) the same than in previous models.
* p-value < 0.05, ** p-value < 0.01, + p-value < 0.1

As shown in M9, 'Perceptions of police' and 'Perceptions of municipality services' are negatively associated with violent victimization. However, while the influence of the first is significant at individual and neighbourhood level, with 95% of confidence, the influence of the second is only significant at individual level, and with 95% of confidence. In the case of property victimization, only the association with 'perceptions of police', at

individual level and neighbourhood level, are negative and statistically significant, the first with 95% of confidence and the second with 90%; the association between 'perceptions of municipality', at individual and neighbourhood level, and property victimization are also negative but non-significant.

More specifically, holding other variables constant, the likelihood of being a victim of violent crime can be low for a family (and its members) when 'Perceptions of police' is high or increased (M9 in Table VII.10). In the same sense, a higher neighbourhood mean of 'Perceptions of police' is associated with a lower probability for families of being victims of violent crime. Regarding property victimization the same relationship is observed. The risk of being victim of property crimes can be low for a family (and its members) when the 'Perceptions of police' is high or increased. When the neighbourhood mean of this variable is higher, the risk of property victimization can be lower than in the opposed context. Besides, the probability of being a victim of violent crime can be low for a family when the 'Perception of municipality services' is high or increased (M9 in Table VII.10), controlling for other variables. The other relationships are not statistically significant.

Concerning the 'Police-community nexus', in M9 it can be observed that this variable is positively associated with violent victimization and property victimization. However, while in the model of property victimization its influence at individual and neighbourhood level is only significant with 90% of confidence, in the model of violent victimization the influence at the individual level is significant, with 90% of confidence, and at the aggregated level with 95% of confidence. This means that, holding other variables constant, the likelihood of being victim of a violent crime can be high for a family (and members) when they recognise the existence of a police-community nexus. But overall, the probability of violent household victimization is high when the community perception (aggregated measure) of the police-community nexus is positive. The same kind of relationship is observed in the case of property victimization risk, within the local context.

Those results suggest that, when neighbours have a positive perception of the police services at local level and their willingness to answer residents' calls it is more likely that they will want to cooperate with police in terms of reporting crime and during the investigation process. These kind of proactive behaviours may reduce victimization risk

as well as perceptions of insecurity - as was stated in the literature review (Kochel, 2012; Sun et al., 2012). Besides, as Carr (2003) and Velez (2001) argue, if residents of a neighbourhood perceive that local police support their efforts to deal with community issues, they can be more willing to engage in crime prevention initiatives. As a consequence of that, the risk of violent and/or property victimization within the local context will tend to decrease. However, the opposed argument is also probable. In neighbourhoods where the risk of violent and property victimization is low, it is more likely that the residents will perceive the police capacity or willingness to answer community calls more positively than in places where crime levels are high.

Although the influence of the variable 'Perceptions of municipality' is less preponderant than the police perception, a similar interpretation can be suggested. Thus, a positive perception of the municipality services linked with safety and environmental care (e.g. cleaning of public places) may improve residents' intention to report community conflict, disorder and crimes to the authorities, and also to take part in local organisations. As a result of that process the prevalence of victimization, particularly by violent crime, will tend to fall. In this case, again, the opposed argument is also possible. In low-crimes areas it is more likely that residents have a good perception of the authorities in respect of services and programmes of safety. In any of these scenarios, the most important fact is that all these processes can feed back on each other, generating virtuous circles.

Nonetheless, the evidence that a positive perception of the 'Police-community nexus' is associated with a high risk of violent and/or property victimization may contradict the prior interpretation and also the 'New parochialism' hypothesis. This finding implies that in neighbourhoods where the prevalence of violent and/or property victimization is high, the police-community exchange tends to increase along with, in some cases, the development of police-community partnerships. On the other hand, where the level of victimization is low or falling this kind of police-community meeting occurs less frequently. Therefore, this evidence suggested that in Santiago neighbourhoods the police-community nexus seems to emerge from the police conducting themselves in reaction to increased crime, rather than from a systematic and persistent preventive strategy.

On the other hand, in M9 it can also be observed that after the introduction of 'Perceptions of police', 'Perceptions of municipality' and 'Police-community-nexus' the effect of concentration of poverty decreases and becomes non-significant, compared to previous models where only control variables and neighbourhood structural variables were included (M3). This evidence tends to support H8, particularly concerning the fact that public control variables mediate, in a large proportion, the negative effect of neighbourhood structural conditions on violent victimization. Nonetheless, in order to confirm this hypothesis a model having these mediating variables as dependent variables should be estimated; this will be analysed in the next section.

The mediator role of the 'public control' variables

The multilevel model of perception of police, perception of municipality and police-community nexus (Table VII.11) reveals that these three variables are negatively influenced by neighbourhood concentration of poverty, while neither variable is associated with the mean of residential stability. In other words, a high concentration of poverty is associated with low perceptions in the three variables relative to the public control dimension. These variables can thus be considered a causal channel between structural conditions and victimization.

In addition, the variability of the two variables related to the police can largely be attributed to differences between neighbourhoods (ICC: 25%), and the variable of 'Perceptions of municipality' also explains a notable proportion of neighbourhood characteristics (ICC 38%). These finding is confirmed by the Goldstein reliability test, which in the tree models express very good levels (0.88, 0.93 and 0.93 respectively). Those outputs suggest that the 'contextual effects' of neighbourhoods significantly affect the variability of these public control variables. The mediator role exerted by 'Public control' variables, in the relationship between structural variables and household victimization, can be interpreted in the following way.

Table 11. Mixed effects linear models of Mediating Variables (Coefficients)

Predictor variables (a)	Perception of police	Perception of municipality	Police-community nexus
Fixed effects / Neighbourhood level			
Concentration of poverty	-0.25**	-0.28**	-0.08*
Mean of residential stability	0.02	-0.01	0.00
Intercept	0.21**	0.13*	-0.02
Random effects			
ICC (ρ)	25%	37%	25%
Reliability test	0.88	0.93	0.89
Number of obs. / N groups	5,633 / 242	5,633 / 242	5,703 / 242
Min. obs. per group / Mean	12 / 23	12 / 23	12 / 23

a) Models were estimated considering control variables, but they were not included in this table.
** p-value < 0.01, * p-value < 0.05 (+ p-value < 0.1)

In neighbourhoods with a high concentration of poverty, people frequently have a negative perception of police and authorities with respect to their willingness to answer community's demands and their capacity to deal with crime. Also, they have low knowledge of the experience of police-community meetings, although the last association is less relevant than the two previous ones. As a result of the negative perception of the authorities it is likely that those neighbours may not want to report local conflicts, disorder or crimes, and even less to collaborate with police in crime investigation or crime prevention initiatives; and this in turn may influence increasing risk of violent and property victimization at the local level. After that, high levels of crime may further reduce those negative residents' perceptions of the authorities in a vicious circle that is difficult to stop.

In other to confirm or refuse the prior findings in the next section Structural Equation Multilevel models (SEM) for violent and property victimization were tested and interpreted, in that models, direct and indirect effects of structural neighbourhoods variables where estimated.

VII.4.2. The Extended Model of SDT: the complementary role of formal and informal controls

Based on findings of ecological studies, hypothesis 9 (H9) was defined as: **'***Even though the structural conditions of some neighbourhoods may be disadvantaged, collaboration among neighbours, social cohesion and informal control, and a good perception of*

authorities (police and municipality) can contribute to develop a new form of public control (or 'New parochialism'), and as a consequence, the risk of violent victimization will be reduced, but not necessarily the risk of property victimization'. To evaluate this hypothesis, represented in Figure VII.4, a Multilevel SEM of violent and property victimization will be analysed (M10 in Table VII.12).

In M10 the previously tested variables, 'Collaboration', 'Social Cohesion' and 'Informal control' were incorporated, next to 'Public control' variables. Regarding violent victimization risk, in this model the influence of 'Social Cohesion', 'Informal control' and 'Perceptions of police', at the individual level, are negative or inverse, which means that good or positive levels in those perceptions at individual level are associated with a low risk of violent victimization, within the local context. Although 'Collaboration' and 'Perceptions of Municipality' are also associated with violent victimization in the same way, their influence becomes non-significant in M10. By contrast, the influence of 'Police-community nexus' is significant and keeps the same direction, namely, a positive perception of this variable is associated with a high risk of violent victimization.

At the neighbourhood level, the mean of 'Social cohesion' and the mean of 'Perception of police' maintained their relevant inverse association with household violent victimization, so they can also be associated with a low risk of this type of victimization. Besides, the mean of 'Police-community nexus' become non-significant. Also, the structural neighbourhood variable of 'Concentration of Poverty' is significant and have a direct effect. This means that in neighbourhoods with high concentration of poverty the likelihood of violent victimization is higher than in the opposite circumstance.

Concerning property victimization, the influence of 'Social cohesion' and 'Perceptions of police', at the individual level, keep the same inverse direction as in previous models, so this means that a positive perception in those are associated with a low risk of property victimization in the local context. In the opposite way, a positive perception of 'Police-community nexus' is associated with a high risk of property victimization. Nonetheless, as the measurement part of the M10 reveals that the factorial model of the 'Policy-community nexus' is not significant, then the influence of this variable can be questioned and in further model was dropped out.

At the neighbourhood level, the inverse association between the mean of collaboration and the risk of property victimization becomes significant, so a high level of community collaboration may contribute to decrease the risk of property victimization. Contrarily, the direct association between the mean of 'Police-community nexus' also becomes significant, which means that a high mean of 'Police-community nexus' is associated with a high risk of property victimization in neighbourhoods.

Although prior findings suggested that social cohesion, informal control, and positive perceptions of police can be associated with a lower risk of violent victimization, and some of them also with a lower risk of property victimization, this evidence is not enough to support the hypothesis of the existence of a 'New form of public control' (or 'New parochialism'*)* and its positive influence in the prevention of crime victimization. To confirm or refuse that idea it is necessary to review an additional multilevel SEM model where factorial models of the mediating variables are tested, at the same time that regression models of violent and property victimization including direct and indirect effects of neighbourhoods structural variables, are estimated (see M11 in Table VII.12).

In the final SEM model is observed that Social Cohesion and Perception of Police are negatively associated with household **violent victimization and property victimization**, both effects measured at individual level. However, while the influence of Social Cohesion is significant at 0.05 level (with 95% of confidence) in both models, the influence of Perception of Police is only significant at 0.1 level for property victimization. Besides, the influence of Social Cohesion and Perception of Police on violent victimization are also significant at neighbourhood level, with 90% of confidence, but they are not significantly associated with property victimization. By contrast, Collaboration is associated with property victimization at neighbourhood level. The influence of the variables Informal Control and Perception of Municipality on violent and property victimization became non-significant (M11 in table VII.12),

In parallel to the main regression models, correlations between explanatory variables were tested and also regression models of this mediating variables. Outputs of this section shows that all organizational and also public control variables are positively

correlated which suggested that the complementarity between these variables in the reduction of violent and property victimization is possible, and overall, necessary.

Table VII. 12. Multilevel SEM of Violent and Property Victimisation with direct and indirect effects

	Violent victimization (OR)		Property victimization (OR)	
Structural Model (a)	M10	M11	M10	M11
WITHIN LEVEL				
Collaboration (f3)	0.93	0.95	1.04	1.05
Social cohesion (f5f6)	0.90*	0.91*	0.85**	0.85**
Informal control (f7)	0.94*	0.95	1.03	1.04
Perception of police (f8)	0.94*	0.95*	0.96*	0.96+
Perception of municipality (f9)	0.96	0.97	0.97	0.98
Police-community nexus (f10) (b)	1.23**	-	1.11	-
BETWEEN LEVEL				
Mean collaboration (Mf3)	0.99	1.01	0.76*	0.93*
Mean social cohesion (f5f6)	0.80*	0.87+	1.09	0.93
Mean informal control (f7)	1.00	0.97	1.02	1.02
Mean perception of police (Mf8)	0.92*	0.96+	0.91	0.98
Mean perception municipality (Mf9)	1.04	1.01	0.99	0.98
Mean police-community nexus (Mf10)	1.09	-	1.37*	-
Concentration of poverty	1.09**	1.06	1.02	1.01
Mean of residential stability	0.98	1.00	1.03	1.05
C. poverty with R. Stability	0.37**	-	0.37**	-
Random effects				
L2 variance (ψ): Between MN	0.09	0.10	0.12	0.15
ICC (ρ)	2.7%	3.0%	3.6%	4.3%
Reliability test	0.39	0.42	0.47	0.51
Chi square test	3964.12**	3430.18**	3970.17**	3431.92**
Number of obs. / N groups	5711/242	5711/242	5711/242	5711/242
Average cases per group	23.6	23.6	23.6	23.6

* p-value < 0.05, ** p-value < 0.01, + p-value < 0.1
a) The most significant control variables were tested in models but they were not included in this table.
(b) Even if the influence of this variable was significant, at individual level, the outputs of the measurement part of the three models showed that the configuration of this variable is not significant.

In addition, findings of M11 reveal that Concentration of Poverty are significantly and inversely associated with Social Cohesion, Perception of Police and Perception of Municipality. Thus, when Concentration of Poverty are higher within neighbourhoods, Social Cohesion, Perception of Police and Perception of Municipality are more negative or tend to decrease. The Mean of Residential Stability only have a significant direct influence on Social Cohesion, but not on public control variables. Besides, it is relevant to notice that when the estimation of direct and indirect effects is included in model 11, the effects of the organizational variables on both type of victimization tend to decrease

and the direct effects of Concentration of Poverty on violent victimization disappeared. In sum, just the indirect effect of Concentration of Poverty is confirmed, and apparently, the main mediating channels between this structural variable and its effects on violent victimization are the variables of Social Cohesion and Perception of Police.

Mediating part of the Model 11, Correlations and Regressions (coefficients)

Structural Model	Collaboration	**Social cohesion**	Informal Control	**Perc. Police**	Perc. Municipality
WITHIN LEVEL					
(Correlation with)					
Collaboration	-				
Social cohesion	0.33**	**-**			
Informal control	0.25**	**0.31****	-		
Perc. Pólice	0.19**	**0.16****	0.11**	**-**	
Perc. Municipality	0.25**	**0.21****	0.16**	**0.29****	-
BETWEEN LEVEL					
(Regressed on)					
Concentration of poverty	0.16*	**-0.12****	-0.07	**-0.53****	-0.39**
Mean of residential stability	0.00	**0.14****	-0.07	**0.06**	-0.01
* p-value < 0.05, ** p-value < 0.01, + p-value < 0.1					

Based on the previous findings, concerning the hypothesis of 'New parochialism' is necessary to stablish some conclusions. Although informal control was inversely associated with violent victimization in most of the tested models, this influence was only proved at individual level and not at the neighbourhood level. In fact, even if this variable is affected by contextual effects of the Santiago neighbourhood, this was not explained by any of the two structural variables tested in this thesis. Thus, this finding suggest that Informal Control in those models did not act as a mediator variable between structural effects and any victimization outcome. The same conclusion can be suggested for models of property victimization, where informal control did not have any significant influence in most of the tested models.

By contrast, Social Cohesion and Perception of Police were inversely associated with violent victimization at individual level, finding significant at 0.05 level. And, these two variables were also inversely associated with violent victimization when they were measured at neighbourhood level, although in this case the level of significance is lower

(0.1 or 90% of confidence). In addition, Social Cohesion at individual level are also associated with property victimization. Besides, as these two predictor variables were influenced by the neighbourhood level of Concentration of Poverty, can be suggested that these variables act as a mediators between structural effects and violent victimization.

On the other hand, the positive and strong correlation expressed between informal control and social cohesion, and the positive and moderated correlation that informal control have with the other organizational and public control variables, may suggest that this variable can also contribute, in some extent, to produce preventive actions within the local contexts. Nonetheless, this evidence is not enough to confirm the 'new parochialism' hypothesis.

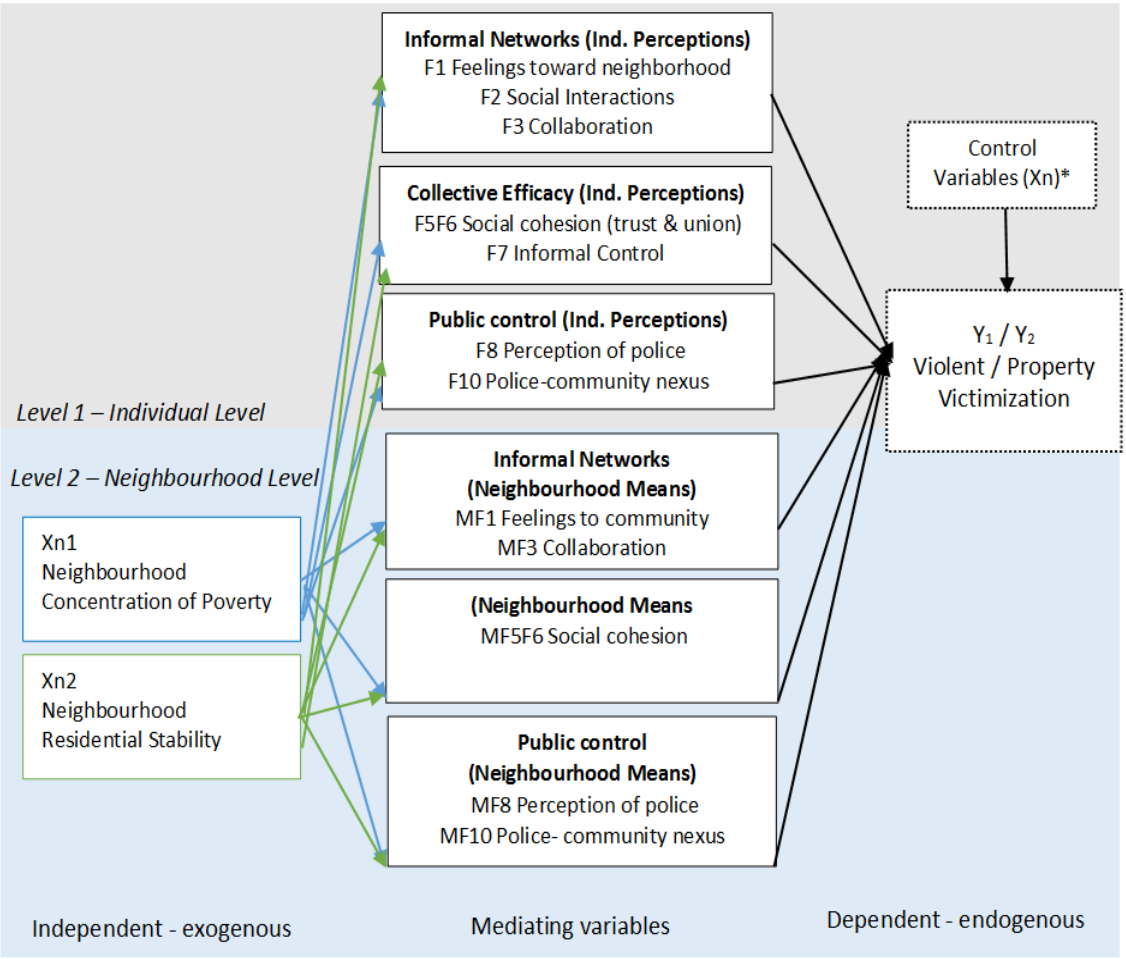
Although the previous findings dismiss both the 'Social disorganization' theory and the 'Collective efficacy' theory, establish a crucial point to understand the influence of social controls in neighbourhoods in the Latin-American context. As informal control is not associated with concentration of poverty, but is strongly associated with other community and public control resources, even in poor areas Informal Control could be activated if collaboration and social cohesion are expressed at high levels, and overall if solid authorities-police-community partnerships would be promoted.

However, in the case of a poor neighbourhood where residential stability is high, and as a consequence informal networks are dense or strong, these community resources may actually limit rather than promote the development of informal controls. The explanation of this phenomenon had been offered previously by Triplett et al. (2003) and Browning et al. (2004). They argued that in poor areas of high-crime informal networks can be composed by both law-abiding citizens and delinquents, and the mutual obligations that emerge from these relationships may restrict the community capacity to exert informal control. A similar argument has been made in Latin-American qualitative studies of crime (e.g. McIlwaine and Moser, 2001; Arias, 2006, Lunecke and Ruiz, 2007).

Regarding 'Perceptions of police', in Table VII.12, it is observed that this variable is positively associated with 'Collaboration' and 'Social cohesion'. Besides, a positive

evaluation of the municipality services also reinforced the positive perception of the police. This positive association highlights the idea that a good and constant relationship between police, community and authorities is essential to improve residents' perceptions of the police, and, then, the neighbours' exercise of informal control.

Figure VII. 4. The Extended model of SDT to Explain Victimization



Source: own elaboration based on literature review and hypothesis

Notation:
- Squares represent observed variables included in multilevel regression models.
- Arrows represent associations (+ or -) tested through multilevel regression models.
* Control variables at household level are: female household head; presence of child at home, educational level and working position of the household head, income dependence and length of residence.

Finally, concerning the influence of the neighbourhood structural variables, it is relevant to highlight that, in contexts of high concentration of poverty the 'Perceptions of police' used to be lower than in rich areas. Such situations have been strongly documented in the international literature (e.g. Triplet et al., 2005; Klinger, 1997) and in national literature (e.g. Fruhling, 2007). Thus, in order to promote proactive and stable partnerships between police and community rather than merely contingent or reactive meetings it is necessary to take seriously the negative perceptions that residents of poor neighbourhoods commonly manifested.

Although the evidence discussed here is not sufficient to confirm the 'New parochialism' hypothesis, it is relevant to highlight that the positive influence of Social Cohesion and Perception of Police, and the positive associations between most of the tested community and institutional resources, suggested that they are channels through which is possible to build more proactive and sustainable relationships between community and authorities in order to deal with crimes at the local level. Topic that required further research.

VII.4.3. Summary of hypothesis test: H8 and H9

Based on the previous analysis, H8 can be confirmed in great part. Low perceptions of police and municipality services at individual and neighbourhood level are associated with a high risk of household violent victimization, but the high risk of property victimization is only influenced by negative 'Perceptions of the police'. On the contrary, positive perceptions of the 'Police-community nexus' are associated with a high risk of violent and property victimization. Moreover, when these 'Public control' variables are incorporated into multilevel models, the influence of structural variables on violent victimization becomes non-significant. As a result, these variables can act as a causal channel between structural conditions and household violent victimization, because they were not associated with property crimes.

Nonetheless, while the evidence demonstrated that in neighbourhoods with a high concentration of poverty, 'Perceptions of police', 'Perceptions of municipality services' and of the 'Police-community nexus' are, on average, negative or low, the positive influence of residential stability on those variables was not demonstrated. Therefore,

based on those findings, it is confirmed that the mediator role is exerted by 'Public control' variables in the relationship between concentration of poverty and household violent victimization, but not in the case of property victimization. In sum, H8 can be largely supported.

Concerning H9, the evidence showed that positive perceptions of 'Social Cohesion', 'Informal control' and of 'Perception of police' response to calls are associated with a low risk of household violent victimization. At the same time, an overall positive level of 'Social cohesion' and 'Perceptions of police', at the neighbourhood level, tend to reinforce that positive trend toward violent crime prevention. Regarding household property victimization, only 'Social cohesion' and 'Perceptions of police' at individual level, and 'Collaboration' at neighbourhood level, expressed an influence in the direction of decreasing victimization risk.

In addition, it was demonstrated that 'Collaboration' and 'Social cohesion' are positively and strongly associated with 'Informal control', and also a positive 'Perception of Police' and 'Perception of Municipality services' are positively associated with 'Informal control'. On the side of 'Perceptions of police', all organizational variables 'Collaboration' 'Social Cohesion' and 'Informal control' are positively associated with the improvement of this perception. Besides, a positive evaluation of the municipality also reinforced a positive perception of the police.

Based on that evidence, the hypothesis of the 'New parochialism' may be partly supported. However, as those community resources are not produced in a void, the main obstacle to promote them still continues to be the adverse structural conditions present in a great proportion of neighbourhoods. Although outputs showed that the influence of structural variables on violent victimization becomes non-significant when control variables and community mechanisms are included, concentration of poverty still can exert an indirect effect through its negative influence on 'Social cohesion' and 'Perceptions of police', at individual and neighbourhood level.

Therefore, even if in poor neighbourhoods there are low levels of 'Informal control', this mechanism can be developed if 'Collaboration' and 'Social cohesion' were expressed at

high levels, but overall if solid authorities-police-community partnerships are promoted. Nonetheless, in poor neighbourhoods where residential stability is high and informal networks are dense, it can be recognised that the promotion of informal control and preventive-partnership strategies would be more difficult to achieve.

VII.5. Conclusions

Regarding hypothesis 7 derived from 'Collective efficacy' theory, the findings analysed only offer partial support. While 'Social cohesion' is inversely associated with violent and property victimization at individual and neighbourhood level, 'Informal control' is also inversely associated with violent victimization, but at individual level, not with property victimization. However, when 'Feelings toward neighbourhood' and 'Collaboration' were incorporated the influence of 'Social cohesion' and 'Informal control' on violent victimization became non-significant. Despite this fact, it was found that a strong correlation between 'Feelings toward neighbourhood' and 'Social cohesion', and the underlying risk of multicollinearity, affected the significance of the influence of both variables on violent and property victimization. For that reason, in final models, where the risk of multicollinearity between 'Feelings' and 'Social cohesion' was eliminated, the influence of this last variable in both types of victimization became significant.

The evidence, though, supports partially the hypothesis because the perception of 'Informal control' only became significantly associated with violent victimization in final models, when 'Public control' variables were incorporated. The mean of 'Informal control' at neighbourhood level did not have any significant association with violent or property victimization. As the incorporation of 'Social cohesion' and 'Informal control' in models did not eliminate the effect of organisational variables ('Feelings' and 'Collaboration'), nor eliminate the effect of 'Perceptions of police' and 'Perception of municipality, these findings refute evidence from 'Collective efficacy' studies, in which was asserted that the combination of social cohesion and Informal control is the most important mediator in the relationship between structural variables and violent victimization.

In addition, while the structural variable of 'Concentration of poverty' only has influence on 'Social cohesion', the 'Mean of residential stability' only shows influence on 'Informal control'. In consequence, even if both 'Social cohesion' and 'Informal control' may act as mediating variables, they are two different channels between structural variables and violent victimization. Thus, this evidence are in the line with studies which questioning some assumptions and findings of the 'Collective efficacy' theory.

Lastly, the two hypotheses related to the influence of the 'new form of public control' (or 'New parochialism' hypothesis) on the risk of violent victimization, which come from new ecological approaches to crime, were only partly confirmed.

Concerning **hypothesis 8**, the findings suggested that low perceptions of police and municipality are associated with a high risk of household violent victimization, but the risk of property victimization is only influenced by negative perceptions of the police. By contrast, the positive perception of the police-community nexus is associated with a high risk of violent and property victimization. Although the contrary argument is also possible, namely, in neighbourhoods of high-crime levels is more likely that meeting between community and police will be carried out. In addition, the evidence demonstrated that the mediator role was being exerted by 'Perception of police', in the relationship between concentration of poverty and violent victimization, but not in the case of property victimization.

Regarding **hypothesis 9**, the evidence showed that perceptions of 'Social Cohesion', 'Informal control' and 'Policing' are associated with a low risk of violent victimization. Also, positive levels of 'Social cohesion' and 'Perceptions of police' (at a neighbourhood level) may reinforce crime prevention or reduction for violent crimes. In the case of property victimization, only 'Social cohesion' and 'Perceptions of police' at individual level, and 'Collaboration' at neighbourhood level, expressed an influence of decreasing the risk of victimization.

In addition, it was demonstrated that 'Collaboration' and 'Social cohesion' are positively and strongly associated with 'Informal control', but, especially, a positive perception of 'Municipality services' and of the 'Perception of police' are associated with positive levels

of ‘Informal control’. On the other hand, ‘Perception of police’ is reinforced by the presence of all community resources and also by a positive evaluation of ‘Municipality’.

Considering previous findings it can be argued that: *even if in poor neighbourhoods there are low levels of informal control, this mechanism can be developed if collaboration and social cohesion are expressed at high levels, but overall if solid authorities-police-community partnerships will be promoted*. However, the promotion of preventive-partnership strategies would be more difficult to achieve in context of high residential stability and dense informal networks, which are not always oriented toward proactive and preventive goals.

CHAPTER VIII. DISCUSSION AND CONCLUSIONS

VIII.1. The research problem, questions and hypotheses

At the beginning of this thesis, it was pointed out that, after three decades of a predominant upward tendency (1980-1990 and 2000) in the reporting rates of high-social-impact crimes, a stagnation process with a downward trend in most of these crimes, particularly as regards violent crimes, had been observed in Chile since the end of the year 2000. In this sense, Chile has sustained a privileged position within Latin America, the second most violent region in the world. Nonetheless, as it is often, 'big numbers' tend to hide a reality of unequal crime distribution in big cities of the country, especially in the capital, Santiago. An analysis of a decade of police crime statistics (2005-2015) made in this thesis (Chapter I) demonstrated that crime reporting rates for property thefts are higher in higher-income and mid-high income districts, while violent crimes (e.g. robbery, injury, homicides) are predominant in middle-low and low income districts.

Although official statistics (from police or victimization surveys) did not allow confirmation of those trends at the neighbourhood level, several case studies developed in Santiago and other big cities, during the last two decades, have revealed that greater victimization levels observed in poor districts tend to be even higher in specific small territories. Those neighbourhoods are not only characterized by the concentration of diverse disadvantaged conditions (concentration of poverty, social exclusion, poor public services, etc.), but also by high levels of violence expressed in different ways. For residents of these areas, violence linked to drug trafficking and bearing of firearms brings about the greatest concern.

In search of explanations to these crucial issues, several studies have been carried out in Latin America and Chile over the last two decades, following an ecological perspective of crime. However, just few of them have attempted to find a causal explanation of the problem through the testing of theories and hypotheses. Besides, considering that most ecological theories have emerged in the context of North American cities (e.g. Chicago), it is worthwhile to mention that none of these studies have attempted to produce original

theories or to adapt theoretical assumptions to the local context. This thesis, therefore, intends to fill this gap by testing ecological theories to the reality of crime victimization which affects residents of Santiago City Neighbourhoods, based on a dataset from 242 **neighbourhoods** across different socioeconomic statuses.

Although not a single and consensual definition of neighbourhood was found, based on the literature review, a neighbourhood was theoretically defined in this thesis considering five elements: a neighbourhood is the smallest physical area embedded within the city, and it is shaped by hierarchically nested communities; it is an ecological unit in which people and institutions share a physical space and get psycho-social benefits, and consequently, a collective life emerges from the social relationships that exist among the residents and the sets of institutional arrangements. In addition, a neighbourhood can be a source of opportunity and constraint, and, it is an open and modifiable space, where limits are not always clear.

Regarding the operational definition or delimitation, as Taylor (2012) argued, there is not a single or correct approach about neighborhood limits for research or policy purposes. However, it is evident that the spatial scale chosen to represent a neighborhood should match the spatial scale of the issue that is being tackled. In the case of Santiago neighbourhoods, although characteristics of the broader context (the city) may influence the victimization experience, individual and household features as well as organisational and institutional resources, available within small geographical areas, are crucial to understand and to deal with the issues. Thus, when the neighbourhood delimitation is closer to the 'real' local boundaries, residents' concerns can be more easily addressed and preventive policies executed more effectively.

The micro-neighbourhoods (MNs) constructed for the multilevel study of 'Crime and Urban Violence' in Santiago city mainly respond to the 'home area' scale, defined by Kearns and Parkinson (2001). The 'home area' is the smallest unit of a neighbourhood, which covers an extension between 5 and 10 minutes' walk from one's home. Thus, the multilevel study of crime in Santiago neighbourhoods defined MNs as 'a small geographical area composed of 800-1,000 inhabitants within the boundaries of a local district. In these areas residents have the possibility of getting acquainted with their

neighbours and it is possible to walk through it in approximately 15 minutes, although some institutional resources and services can be located outside this area.' (Tocornal, Tapia & Carvajal, 2014: 87-88).

The above-cited study of ´Crime and Urban Violence' in Santiago neighbourhoods supported a multilevel approach to crime victimization. Following this approach, most ecological theories of crime have highlighted that both individual factors and macro-social factors contribute to explaining the increase in the likelihood of crime victimization, establishing a direct criticism of previous micro-level theories focused on individual explanations of crime. This perspective has lived a great development mostly due to the renaissance of the Social Disorganization Theory (SDT), the emergence of community surveys and hierarchical data modelling.

As was discussed in the theoretical background of this thesis (Chapter III), the SDT stated that neighbourhood structural conditions affect a community's capacity to realize common values and maintain social order, through the social controls exerted by private and parochial networks. Consequently, within these disorganized communities, crime victimization increases and remains high throughout time. Offering a critical but also renewed vision of the SDT, more recent ecological studies on crime have stated that nowadays infrequent interactions among neighbours are the usual scenario indeed, and these kinds of relationships may have stronger effects on the reduction of crime. In this sense, the Collective Efficacy Model (CEM) proposed that social cohesion combined with neighbours' willingness to intervene in local issues contributes to the development of an 'effective community capacity to prevent crime'. Although a great body of international literature has accumulated supporting the CEM, findings from Latin American studies are reduced and mostly contradictory, dismissing the validity of the theory in this context.

In search of an alternative explanation to the issue, some ecological studies were also reviewed in the theoretical chapter which proposed the existence of a new form of public control: the "new parochialism hypothesis". Those studies asserted that even in contexts of weak ties, if some residents are capable of developing strategic links with resources outside the neighbourhood, they can produce a new type of informal control, which consists in the interplay between formal control and informal control. In poor areas of

Latin American countries where police agencies are mostly perceived as negligent, corrupt and unfair, the possibility to build a police-community partnership is notably challenging. Considering that in Latin America and Chile there is still reduced evidence to support this kind of ecological hypothesis, in an attempt to fill this gap, this study proposed the next research questions:

To what extent do neighbourhood structural conditions, community-organizational mechanisms and a new form of public control influence the experience of violent and property victimization in households of Santiago neighbourhoods? And*, to what extent do community-organizational mechanisms and a new form of public control mediate the relationship between neighbourhood structural conditions and the likelihood of being a victim of a crime in Santiago neighbourhoods?*

Thanks to the answer of those questions, which offers a multi-causal/multilevel explanation of crime victimization and evaluates the role of community resources and public control institutions, this thesis presents a significant contribution to the understanding of crime distribution in Latin American cities and neighbourhoods. The summary of results regarding these research questions are exposed in the next section.

VIII.2. Summary of results concerning hypothesis test

Explanatory factors and their associations: findings from chapter V

In the classical theory of Social Disorganization (SDT) and, in the revisited version proposed under the Collective Efficacy theory (CET), community mechanisms such as: friendship ties, informal networks, social cohesion, among others, represent the main mediating channel in the relationship between the neighbourhood structural variables and the outputs of violence and/or crime victimization. However, as was discussed in the theoretical chapter, the most adamant theory defenders in each case had erroneously attempted to reduce the explanation to a single uni-dimensional construct.

In the classical theory (e.g. Shaw and Mckay 1942) and also in more recent studies based on the SDT (e.g. Sampson and Groves 1989), authors refer to the 'social organization or disorganization' as the crucial mediator factor, whose components will be strongly correlated, and then, they will produce the same linear effect on delinquency (aggregated crimes rates) and/or on victimization (individual level risk or probability). Based on a critical revision of the SDT and empirical studies, Sampson and colleagues (1997, Morenoff et al 2001, Sampson 2012) asserted that some variables relative to the 'social organization' component, such as friendship ties, formal and informal networks, are not often inversely associated with violent victimization or have diverse effects depending on the type of crime; but instead, 'Collective Efficacy' always has a significant negative effect on violence, delinquency and violent victimization. Collective efficacy is a multidimensional construct formed by 'Social Cohesion' and 'Informal Control', but when converted into a single index which is associated to victimization in a unique linear direction, the multidimensional nature of the concept is lost.

Based on this theoretical discussion, and after the statistical analysis applied to the 2010 survey data of the 'Santiago City Neighbourhoods' study, findings of this thesis demonstrated that practically all of the tested concepts measured through categorical variables (perception scales and/or multiple-choice questions) resulted in consistent and distinguishable latent factors – please see results of Exploratory Factor Analysis in Chapter V-.

The four latent factors related to 'Social organization theory', identified in this study were: *feelings towards neighbourhood, friendship ties, social interactions and collaboration among neighbours*. These four factors have a consistent structure, and are clearly dominated by observational variables with moderate-to-high loadings. Although the four factors were associated, most correlations are low or moderate without implying any risks of multicollinearity (<0.8). However, as some scholars have argued that correlations between 0.6 and 0.8 can also have negative effects on model estimators within complex models, the moderate association between 'Social interactions' and 'Collaboration' was managed with caution within the multilevel models (in Chapter VII). In sum, although the different kinds of 'informal networks' analysed in this thesis were associated, they are in essence independent social mechanisms or attributes.

In relation to the 'Collective Efficacy theory' three distinguishable latent concepts were identified: *Trust, Unity and Informal Control*. Each of these factors was in turn shaped by observational variables with high loadings. However, while the association between informal control and trust, and the association between informal control and unity are moderate, the correlation between trust and unity is very strong and this implies a high risk of multicollinearity for regression models. The acknowledgment of that risk motivated a change in the selection of factors from EFA; as the two-factor model offered a good fit of the data and it was also theoretically supported, the factors of Social Cohesion and Informal Control were finally selected. These two factors were associated yet clearly independent factors, and they did not take part of a single construct of Collective Efficacy.

On the other hand, ecological studies of crime which have considered the influence of public control or formal control on crimes rates and/or victimization risk, generally used measures of 'Police Satisfaction' (e.g. Silver and Miller, 2004). However, as Rhineberger-Dunn and Carlson (2009) criticised those indicators they often include two different dimensions: perceptions of direct measures of formal control, and police-community relations. Those studies made the same mistake as the 'Collective Efficacy' studies: reducing complex and multidimensional concepts into single constructs, and later, examining the direct association of these indexes with victimization.

Findings from the factor analysis carried out in this thesis revealed that the three different latent concepts are clearly identifiable: 'Perceptions of police', 'Perceptions of municipality services', and 'Police-community nexus'. Each factor, in turn, was shaped by observational variables with moderate-to-high factor loadings. The three factors obtained were moderately associated and they did not represent any risk of multicollinearity. Finally, it is relevant to notice that the scales used in this study are only proxies of the measured concepts, and further studies are required with the purpose of confirming the composition and relationships for the factors relative to 'Public control' and 'Police-community nexus'.

In sum, the factors identified in this thesis are in essence independent social mechanisms or attributes, namely, they do not make part of complex constructs. Each of these attributes, measured at individual and aggregated level, expressed different types of

associations with violent and property victimization – as was seen in Chapter VII. Those findings are consistent with new ecological studies of crime (e.g. Rhineberger-Dunn and Carlson 2009; 2011).

The association between victimization and family socioeconomic factors

Research questions of this study emerged under the assumption that it is not possible to find a single explanation for crime victimization because this phenomenon is multi-causal in nature and so, the analysis of its potential causes should always be done in probabilistic terms. In this sense, when researchers attempt to find factors associated with victimization, as in this thesis, a detailed explanation of the process or mechanisms that link household characteristics with particular risk situations should be addressed. Those theoretical explanations were discussed in Chapter III, and based on that analysis the next four hypotheses emerged:

Hypothesis 1: The composition of the household and the vulnerability condition which is derived thereof (female household head, the presence of children and children who are school dropouts), are associated with a higher risk of violent victimization, but not necessarily with property victimization.

Hypothesis 2: Low household socioeconomic status (SES) (measured through educational level, employment status or working position of the household head, family income and the numbers of family members who depend on the families' income sources) is associated with a higher risk of violent victimization. High SES is associated with a higher risk of property victimization.

Hypothesis 3: Low household length of residence and poor quality of family home (unstable property ownership and overcrowded dwellings) are associated with a higher risk of violent victimization, but not necessarily with property victimization.

Hypothesis 4: In neighbourhoods classified as low SES (high concentration of poverty), variables of vulnerability, socioeconomic status and residential stability are associated with a higher risk of violent victimization. Instead, in neighbourhoods classified as high SES (low concentration of poverty), previous associations are not observed.

Attempting to confirm or refute these hypotheses, descriptive and relational analyses were carried out in Chapter VI. Based on those findings, some conclusions can be established accordingly and discussed in the light of victimization theories. First of all, it is possible to conclude that the experience of crime victimization is, overall, a rare event, and even more in the area of residence. In fact, household victimization by violent or property crime within local neighbourhoods of Santiago city has affected around 10% of households. This finding is consistent with international literature which has supported that the risk of being a victim of a minor offence is higher than the risk of being a victim of a serious crime. Additionally, the distribution of victimization prevalence among neighbourhoods is highly unequal, having areas with 0% or 4% of victimised households, and others with more than 11%. This finding is also consistent with evidence from national and international literature, particularly with studies concerning the Santiago City context.

Regarding the influence of household composition and family vulnerability (hypothesis 1), it was found that a family headed by a woman and the presence of children at home have a significant relationship with the risk of violent victimization. Similarly, households headed by women also have a greater likelihood of property victimization as compared to households headed by men. In the light of social 'lifestyle' or 'routine activity' theories, the participation of women in the labour world has forced them to leave their homes unoccupied during long hours, and as a consequence, children and adolescents have been left without adult supervision – a fact which tends to increase their risk of being a victim of violent crimes (Brookman and Robinson 2012) and also of learning deviant behaviour (Sampson y Groves 1989).

On the other hand, research findings show that the risk of violent victimization is higher among families from middle status to mid-to-high SES rather than among poor families. This is in great part because the family of a well-educated household head and, at the same time, of an occupied household head in a relatively good position (manager, self-employed or employed) presents a higher likelihood of violent victimization than a family having a poorly educated household head or a household head in an inactive working position. Similarly, the association among working position of household head, income dependence and property victimization allows us to believe that middle status families have a higher risk of property victimization than very poor families. These evidences not

only contribute to refutation of hypothesis 2, but also to refuting international studies (e.g. Brookman and Robinson 2012). Nonetheless, results with respect to hypothesis 4 revealed that, within mid-low status and poorer status neighbourhoods it is more likely that those relationships among variables are significant; in contrast, in mid-high and high-status neighbourhoods most of the previous associations are not significant. These findings highlight the relevance of multi-level theories of crime and the study of victimization under a multilevel approach.

Concerning the influence of residential stability and quality of dwellings, at household level (hypothesis 3), findings showed that a lower family length of residence and more unstable dwellings are associated with a higher risk of household victimization by violent crime, as compared to families with a more extended length of residence and families living in a stable property. Those relations are not confirmed in the case of property victimization. Based on lifestyle and routine activity theories, it is possible to argue that families living during a short time in their current home/neighbourhood are more attractive targets for offenders because they have reduced mechanisms to protect their home and family members. For instance, their homes do not have security measures such as bars or alarms, and they do not know the safest way to walk from home to public transport. Additionally, from an ecological perspective (e.g. Xie and McDowal 2008), it can be asserted that a 'newcomer' family has scarce social bonds with neighbours and, as a result, has fewer possibilities to develop effective guardianship over their home and family members, particularly children and teens.

Lastly, regarding hypothesis 4, associations between household factors and violent victimization risk were tested within the context of two different types of residential areas: neighbourhoods with high concentration of poverty versus neighbourhoods with low levels of poverty. Thus, it is found that within the more disadvantaged areas the experience of violent victimization is more likely among families from middle level or socioeconomic status than among the poorest families (e.g. well-educated household head). This probably occurs, according to victimization studies (Clark and Felson 2011; Prat and Turanovic 2016), because they represent a more *attractive target* within a poor area. However, this risk can also be higher in families who express a vulnerability condition (for example, families headed by a woman, families composed by children,

families living in the neighbourhood for a short time), due to the reasons previously explained.

By contrast, within neighbourhoods from middle-to-high socioeconomic status (low concentration of poor people), only the presence of children at home was demonstrated to be directly and significantly associated with the risk of violent victimization at the household level. This finding is consistent with studies of victimization, where the variable of 'number of children' is significant across different socioeconomic contexts (e.g. Tseloni 2001).

Finally, most of the associations found in Chapter VI, tested through descriptive statistic and logistic modelling at single level, were confirmed in Chapter VII under a multilevel modelling framework. Thus, household factors detected as significant predictors of violent and property victimization were still relevant when neighbourhood variables were included in models.

The mediator role of community mechanisms in the influence of neighbourhood structural conditions on the risk of violent and property victimization.

Although ecological studies of crime have burgeoned over the last two decades in the Latin American region and in Chile, since only few of those studies have attempted to test theories, and even fewer of them have attempted to adapt theoretical assumptions to the local context, this thesis intends to fill this gap by testing hypotheses based on international theories. However, unlike other studies, theory testing herein is not oriented to confirm or validate ecological theories originally emerged in the context of North American cities. On the contrary, this thesis is aimed at finding multi-causal explanations for the phenomenon of crime victimization and its particular expression in Latin American urban neighbourhoods, considering the reality of Santiago City just as an example for the whole region. Following that purpose, the multilevel modelling offered the best approach to consider both micro-level and macro-level factors, and, as a result, to produce a more comprehensive understanding of the victimization experiences in Santiago city.

Based on this multilevel approach, in the last and the most important analytical chapter of this thesis, Chapter VII, five hypotheses were tested through the implementation of a series of multilevel logistic models, which are defined as follows:

Hypothesis 5: In neighbourhoods where there is a high concentration of poor families (from working class and lower socioeconomic status) and where the average of residential stability is low, the risk of violent victimization will be increased but the risk of property victimization will not.

Hypothesis 6: In neighbourhoods where there is a high concentration of poor families and low residential stability, on average, feelings towards community, friendship ties and informal networks (social interactions and collaboration) will be weak, and as a consequence, the risk of violent victimization will be increased but the risk of property victimization will not.

Hypothesis 7: In neighbourhoods where there is a high concentration of poor families and low residential stability, on average, neighbours' trust, cohesion and informal control will be weak, and as a result, the risk of violent victimization will be increased but the risk of property victimization will not.

Hypothesis 8: In neighbourhoods where there is a high concentration of poor families and low residential stability, on average, perceptions of police and perceptions of the municipality will be negative and the police-community nexus will be weak, and as a consequence, the risk of violent victimization will be increased but the risk of property victimization will not.

Hypothesis 9: Even though the structural conditions of some neighbourhoods may be disadvantaged, collaboration among neighbours, strong social cohesion and informal control, and a good perception of authorities (police and municipality) can contribute to developing a new form of public control, and as a consequence, the risk of violent victimization will be reduced but not necessarily the risk of property victimization.

The main findings, regarding these hypotheses, are summarised and discussed in the light of ecological theories of crime in the next paragraphs. First of all, one of the most relevant findings of the analyses is that the variability of household victimization by violent and property crimes, within Santiago City neighbourhoods, can only be attributed to differences among neighbourhoods (macro-level effects) in a small proportion, around 13-15%. Therefore, the largest part of the variability in those variables depends on individual and/or household level variables (micro-level effects). Most of the multilevel models tested were well fitted and, at the same time, most of the individual, household and neighbourhood level variables significantly improved the quality of the models and the explanation of violent and property victimization.

The analysis provides support for **hypothesis 5**, which was derived from the classical 'Social disorganization' theory. The evidence showed that in neighbourhoods where the concentration of poverty is high and the mean of residential stability is low, the likelihood of being a victim of a violent crime for families who live there is higher than in other places. The risk of property victimization, instead, is not associated with those structural variables. However, when sociodemographic and socioeconomic variables of households were included, the influence of neighbourhood residential stability disappeared. Thus, this finding demonstrated that the direct effect of residential stability is not crucial in the understanding of victimization – hence refuting a long time tradition of ecological studies from developed countries, which has given a crucial role to 'residential instability' in the explanation of violent crime in poor neighbourhoods (e.g. Shaw and Mckay 1942, Sampson and Groves 1989; Sampson et al 1997). Those studies argued that, in poor and instable neighbourhoods, residents have fewer opportunities to foster strong social bonds with their neighbours, and hence, to promote willingness to intercede in community problems.

The present study, as well as previous studies from Latin American cities, has demonstrated instead that residents in poor neighbourhoods are, on average, more stable in their settlements. For that reason this variable becomes irrelevant when searching for an explanation for violent victimization occurred in the context of poor areas. Despite the fact that, in the last part of the analysis, it was found that residential stability has a significant positive association with the perception of informal control: lower

residential stability at neighbourhood level may limit or reduce the exercise of informal control. Thus, residential stability may still have an indirect effect on violent victimization through its influence on the exercise of informal control. Nonetheless, this hypothesis needs more in-depth reflection in further research in order to confirm or refute.

On the other hand, the second hypothesis derived from the SDT, **hypothesis 6**, which considered the association between organisational variables and household victimization (both violent and property), and their role as mediating variables, was mostly refuted. Variables like 'Feelings toward neighbourhood', 'Social interactions' and 'Collaboration' have a similar negative association with the two dependent variables, some of them were associated at individual and neighbourhood level, while others only at individual level. Therefore, it is possible to conclude that the promotion of these organisational mechanisms may be associated with a decrease in the risk of violent and property victimization. Nonetheless, a strong density of friendship ties tends to be associated with a higher risk of violent and property victimization, although this relationship became non-significant in models where all variables were included. This last finding is consistent with studies which have criticised the SDT ideas, particularly in respect of the contradictory influence of informal networks on victimization (e.g. Bellair, 1997; Warner and Wilcox, 1997; Browning et al., 2004).

In addition, the findings of this thesis demonstrated that 'Concentration of poverty' and 'Residential stability' exert an indirect effect on victimization through their influence on people's feelings toward their residential area, at individual and neighbourhood level. As high concentrations of poverty are associated with low or negative 'Feelings toward neighbourhood', they indirectly contribute to increasing the risk of violent victimization. A low mean of 'Residential stability' is associated with low or negative residents' 'Feelings toward neighbourhood' and, then, a higher risk of violent victimization. By contrast, although the association between 'Concentration of poverty' and the other three organisational variables is positive, these associations are not statistically significant. This is a finding that also contradicts the classical SDT.

Therefore, although it is confirmed that in poor and unstable neighbourhoods the risk of violent victimization is high, as already seen, a great part of the explanation depends on individual level effects, and those causal channels were not clarified by the analysis of classical organisational variables. Thus, the evidence is not enough to support the Social Disorganization theory.

Regarding **hypothesis 7** derived from the 'Collective efficacy' theory, the findings analysed offer only partial support. While 'Social cohesion' is inversely associated with violent and property victimization at individual and neighbourhood level, 'Informal control' is also inversely associated with violent victimization, but only at individual level, and it is not associated with property victimization. However, when 'Feelings toward neighbourhood' and 'Collaboration' were incorporated, the influence of 'Social cohesion' and 'Informal control' on violent victimization became less significant. The potential explanation of this finding is that a strong correlation between 'Feelings toward neighbourhood' and 'Social cohesion' was found, which implied a risk of multicollinearity and the consequent reduction in the significance of both variables. For that reason, in final models where the variable 'Feelings' was not included, the influence of 'Social cohesion' in both types of victimization became significant.

In addition, the perception of 'Informal control' have a non-significant influence on violent victimization in final models when 'Public control' variables were incorporated. The mean of 'Informal control' at neighbourhood level did not have any significant association with violent or property victimization. As the incorporation of 'Social cohesion' and 'Informal control' (in multilevel models) did not eliminate the effect of organisational variables ('Feelings' and 'Collaboration'), nor eliminated the effect of 'Public control' variables ('Perceptions of police' and municipality'), these findings refute evidence from 'Collective efficacy' studies, in which it was asserted that the combination of 'Social cohesion' and 'Informal control' is the most important mediator in the relationship between structural variables and violent victimization.

In other words, findings from this thesis demonstrated that the core hypothesis of the Collective Efficacy theory is not confirmed in the context of Santiago Neighbourhoods. Firstly, as was previously seen, 'Informal Control' and 'Social Cohesion' did not take part

of a single factor denominated ‘Collective Efficacy’. Secondly, while social cohesion expressed a significant association with violent and property victimization, at individual and neighbourhood level, in most of the tested models, informal control has a significant association with violent victimization only when it is measured at individual level and only in some of the tested models.

Thirdly, while the structural variables of ‘Concentration of poverty’ and ‘Residential stability’ has influence on ‘Social cohesion’, the ‘Mean of residential stability’ shows influence only on ‘Informal control’. In consequence, even if both ‘Social cohesion’ and ‘Informal control’ may act as mediating variables, they are two different channels between structural variables and violent victimization. Thus, this evidence confirmed studies which manifested serious criticism of the ‘Collective efficacy’ theory (e.g. Rhineberger-Dunn and Carlson 2009; 2011). This evidence also demonstrated, once again, that this kind of theory - emerged in the context of developed countries - is not valid for Latin American cities, or at least, it requires substantial adaptations to this reality.

Lastly, the two hypotheses related to the influence of the ‘new form of public control’ (or ‘New parochialism’ hypothesis) on the risk of violent victimization, which come from new ecological approaches to crime, were largely confirmed.

As regards **hypothesis 8**, the findings confirmed that low perceptions of police and municipality are associated with a high risk of household violent victimization, but the risk of property victimization is only influenced by negative perceptions of the police. By contrast, the positive perception of the police-community nexus is associated with a high risk of violent and property victimization. Although the contrary argument is also possible, namely, in neighbourhoods with high-crime levels it is more likely that meetings between community and police can be produced.

In addition, the evidence demonstrated that the mediator role was being exerted by ‘Public control’ variables (perceptions of police and perceptions of municipality), in the relationship between concentration of poverty and violent victimization, but not in the case of property victimization. In sum, the H8 can be partly supported.

Regarding **hypothesis 9**, the evidence showed that positive perceptions of 'Social Cohesion', 'Informal control' and 'Policing' are associated with a low risk of violent victimization. Also, positive levels of 'Social cohesion' and 'Perceptions of police' (at a neighbourhood level) may reinforce violent crime prevention. In the case of property victimization, only social cohesion and perceptions of police at individual level, and collaboration at neighbourhood level, expressed an influence on decreasing the risk of victimization.

In addition, it was demonstrated that 'Collaboration' and 'Social cohesion' are positively and strongly associated with 'Informal control', and also, a positive perception of 'Municipality services' and of 'Perception of police' is associated with positive levels of 'Informal control'. Besides, positive levels of the previous organizational resources and a positive evaluation of Municipality is also positively associated with 'Perceptions of police'. In sum, this findings suggested a potential proactive nexus between formal and informal controls, and when both mechanisms act together they can produce a significant influence on reducing the crime victimization risk in the neighbourhood context, particularly with respect to violent crimes.

Considering previous findings, it can be argued that: *even if in poor neighbourhoods there are low levels of informal control, this mechanism can be developed if collaboration and social cohesion are expressed at high levels, but overall if solid authorities-police-community partnerships can be promoted*. However, the promotion of 'Informal control' and preventive-partnership strategies would be more difficult to achieve in context of high residential stability and dense informal networks which are not always oriented toward proactive or preventive goals, particularly when a general distrust in the 'others' are installed in most of the neighbouring relationships. This is the main contribution of this thesis, which has multiple theoretical and public policy implications.

VIII.3. Implications of the findings: public policy suggestions

Even though national and international evidence has proved that small areas such as neighbourhoods can concentrate disproportionate levels of violence, this fact thus requiring tailor-made programmes in said territories, in Chile the lack of reliable information at the neighbourhood level has limited the possibilities of generating better policies at this territorial level.

Since the end of the '90s, diverse institutions and public policies have been created in Chile oriented under a 'Citizen Security' approach, thus combining control and crime prevention strategies to deal with violence, crime and insecurity perceptions. Most of these policies implemented at the local level have attempted to deal with the unequal distribution of crime in districts and neighbourhoods of big cities, through the development of local management capacities. Thanks to the improvement of information systems, the technical support from the national government, the central role played by mayors and the participation of local organizations, the security plans implemented at the district levels have shown significant achievements. However, no significant advances have been observed regarding the security programmes focused on neighbourhoods.

Security programmes focused on vulnerable neighbourhoods, in Chile, have emerged so far as a populist response vis-á-vis current circumstances rather than as the result of an accurate diagnosis of the needs existing in certain territories. This situation has been caused, in part, by the lack of reliable information at the neighbourhood level. As a consequence, the design of programmes, the selection process of neighbourhoods and the actions implemented have not been coherent, neither sustainable. Most of the measures implemented have given more value to police-repressive actions and infrastructure investment, leaving behind the necessary development of local management capacities and the involvement of communities in crime prevention initiatives.

In addition, these neighbourhood programmes are usually replaced after changes of government coalitions because no recognition has been made regarding the need to transform those programmes into long-term security policies. Closely related to the lack of continuity of policies, most of these programmes concluded without a rigorous evaluation, which undermines the possibility of raising evidence and generating lessons about what has been done right or wrong in the local interventions.

The findings made in this thesis suggest that, before designing neighbourhood programmes, in-depth diagnoses about local problems be necessarily made, a process in which the community should take a crucial role. As a second step, in Santiago disadvantaged neighbourhoods with a high level of crime and weak access to institutional resources, it is urgent that local authorities and the police not only try to reduce crime through traditional approaches but also improve trust and engagement of the public aiming at building sustainable partnerships among authorities, police and the community.

As the findings of this thesis showed, the improvement of police closeness to the community, following a preventive and collaborative approach, is an imperative demand in order to bestow confidence to local organizations and neighbours with a view to developing their own preventive initiatives. In other words, the community should perceive that the exercise of informal control can be implemented in a safer and more supportive context, and that they are not alone in the effort to deal with violence and crime victimization.

Unfortunately, resorting to the authorities in order to report crimes or to collaborate in crime investigations by neighbours or local organizations is often seen by other neighbours as disloyalty, which tends to put at risk those collaborating individuals. Consequently, these acts tend to damage social cohesion. The foregoing demonstrates that the first initiatives shall imperatively be originated from the authorities and shall be developed with caution, respecting and valuing local resources, but - above all - it shows that the path to follow will tend to be stony and full of obstacles.

Those policies will require a strong political leadership on the part of the local government, to strengthen the efforts for the diagnosis and knowledge of the problems, as well as for the follow-up and evaluation of the whole process with a strong participation of the community. Nonetheless, the specific steps which should be followed by the authorities and police to build stronger bridges between them and the local communities, the best way to promote new forms of social controls, and the types of controls that could be more effective in dealing with crime in distrustful and demobilized communities, are questions which are required to be addressed in further research.

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APPENDICES

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APPENDIX I (from Chapter I)

I.1 Police reports of high-social-impact crimes in Chile

	2005	2006	2007	2008	2009	**2010**	2011	2012	2013	2014	2015	Variation 2005-2015
Property crimes[124]	974,8	960,9	1018,9	1035,9	1179,7	**1171,7**	1262,0	1166,9	1169,4	1204,1	1176,2	20,7%
Violent robbery	300,8	308,7	356,7	331,1	323,1	**279,3**	321,6	276,6	296,3	336,4	342,9	14,0%
Robbery or mugging	105,5	113,2	143,3	143,1	156,6	**148,7**	161,1	143,0	182,2	210,5	202,0	91,5%
Theft	566,3	549,3	562,9	596,6	637,7	**633,3**	699,2	659,2	658,6	662,7	626,9	10,7%
Injuries	537,6	539,6	567,9	588,7	573,7	**530,3**	546,8	457,4	406,6	371,7	337,9	-37,1%
Homicide	1,9	1,9	1,9	1,6	1,7	**1,3**	1,4	1,1	1,3	1,7	1,7	-7,1%
Rape	15,1	15,9	16,1	17,5	17,2	**15,7**	18,0	16,1	15,7	14,2	13,6	-9,9%
High-social-impact crimes [125]	2502,0	2489,5	2667,7	2714,7	2889,7	**2780,3**	3010,1	2720,4	2730,1	2801,2	2701,3	8,0%
Domestic violence	574,2	583,2	653,9	677,0	676,1	**638,5**	707,8	650,1	627,5	587,6	541,0	-5,8%

Sources: Own preparation based on data collected by the Crime Prevention Office (Subsecretaría de Prevención del Delito, 2016).

[124] According to the Chile's national police's terminology, property crimes includes: vehicle theft, theft of car's articles or objects inside, burglary, theft in uninhabited property and another type of theft that use force against property ("robo con fuerza" in spanish).

[125] According to the Chile's national police's terminology, high-social-impact crimes are: property crimes, violent crimes (violent robbery, robbery or mugging, injuries, homicide and rape) and minor theft.

I.2 Police reports of crimes in Metropolitan Region

	2005	2006	2007	2008	2009	**2010**	2011	2012	2013	2014	2015	Variation 2005 - 2015
Property crimes	1054,4	1063,6	1147,0	1142,8	1226,2	**1286,4**	1404,7	1307,5	1345,6	1394,7	1372,2	30,1%
Violent robbery	480,6	510,2	582,8	509,9	476,6	**415,4**	482,6	420,0	472,0	531,1	560,1	16,5%
Robbery or mugging	133,4	145,8	187,6	175,9	192,5	**183,2**	197,6	184,5	248,2	278,7	268,7	101,4%
Theft	497,3	493,6	525,4	541,2	555,8	**570,8**	628,0	596,3	609,3	603,7	578,1	16,2%
Injuries	497,0	501,3	564,0	596,7	553,2	**506,1**	517,1	420,3	383,3	364,0	337,6	-32,1%
Homicide	2,0	2,3	2,6	1,9	2,1	**1,5**	1,8	1,2	1,8	2,5	2,8	36,3%
Rape	16,6	17,4	16,9	19,5	17,8	**15,8**	18,4	16,4	16,6	14,5	14,1	-15,0%
High-social-impact crimes	2074,9	1772,8	1958,5	2732,5	3317,9	**3702,4**	3764,1	3567,6	3347,0	3416,9	3183,0	53,4%
Domestic violence	514,6	505,2	570,9	590,9	566,0	**531,6**	615,4	576,6	561,4	532,5	503,0	-2,2%

Sources: Own preparation based on data collected by the Crime Prevention Office (Subsecretaría de Prevención del Delito, 2016).

I.3 Household victimization in Chile by property and violent crimes

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Variation 2008-2015
Theft of car's articles or objects inside*	27,1%	28,6%	21,0%	18,6%	17,0%	13,5%	16,3%	12,3%	11,1%	11,8%	12,9%	-5,7%
Vehicle theft*	2,1%	2,9%	1,8%	1,7%	2,2%	2,4%	2,6%	2,0%	1,6%	1,4%	1,9%	0,2%
Burglary	7,8%	7,8%	5,6%	5,0%	5,1%	4,0%	5,3%	4,3%	4,2%	3,7%	4,9%	-0,1%
Theft	11,0%	9,9%	8,9%	9,8%	8,8%	8,8%	9,0%	8,2%	7,9%	8,7%	9,0%	-0,8%
Mugging	9,8%	10,9%	7,8%	8,1%	7,1%	4,7%	6,3%	4,4%	3,6%	4,0%	4,6%	-3,5%
Robbery	7,6%	7,8%	7,5%	6,3%	5,9%	4,9%	5,2%	4,2%	3,7%	3,8%	4,6%	-1,7%
Injuries	2,2%	2,8%	2,3%	2,7%	2,9%	1,8%	2,5%	1,6%	1,4%	1,2%	1,7%	-1,0%
Aggregate household victimization[126]	36%	37%	32%	32%	31%	26%	29%	24%	23%	24%	26%	-10%

* At regional level there is not data for 2014, because its sample was only representative at national level.
** Variation 2005 – 2015 is only for referential purpose, because in 2008, it began using the sampling frame of the National Statistical Institute.
Source: Own preparation based on data from National Survey of Citizens Safety (Instituto Nacional de Estadísticas, 2016).

[126] In the National Survey of Citizens Safety (ENUSC), "Aggregate household victimization" is an indicator that represents the household victimization, in one or more of the following crimes: violent robbery, mugging, burglary, theft, injuries, vehicle theft and theft of car's articles or objects inside.

I.4 Household victimization in Metropolitan Region by property and violent crimes

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Variation 2008 - 2015
Theft of car's articles or objects inside*	25,1%	29,2%	20,2%	17,2%	14,8%	13,2%	16,6%	13%	12,5%	---	13,5%	-3,7%
Vehicle theft*	2,0%	3,5%	2,3%	2,0%	2,2%	3,3%	3,3%	2,6%	1,7%	---	2,2%	0,2%
Burglary	7,2%	7,8%	5,6%	4,2%	4,4%	3,2%	4,7%	3,8%	3,7%	---	4,6%	0,4%
Theft	10,5%	10,2%	9,8%	10,8%	8,1%	9,1%	10,6%	8,5%	8,7%	---	9,0%	-1,8%
Mugging	10,2%	13,1%	9,7%	9,6%	8,1%	5,4%	7,3%	5,4%	5,0%	---	5,8%	-3,8%
Robbery	9,4%	10,7%	10,5%	7,7%	7,1%	6,3%	7,2%	5,9%	5,4%	---	6,5%	-1,2%
Injuries	1,8%	2,7%	2,2%	2,6%	3,6%	1,5%	3,1%	1,5%	1,2%	---	1,7%	-0,9%
Aggregate household victimization[127]	37%	41%	37%	34%	31%	26%	30%	26%	26%	--- *	29%	-8%

* These rates were calculated over the household owner particular vehicles.
** At regional level there is not data for 2014, because its sample was only representative at national level.
Source: Own preparation based on data from National Survey of Citizens Safety (Instituto Nacional de Estadísticas, 2016).

[127] In the National Survey of Citizens Safety (ENUSC), "Aggregate household victimization" is an indicator that represents the household victimization, in one or more of the following crimes: violent robbery, mugging, burglary, theft, injuries, vehicle theft and theft of car's articles or objects inside.

I.5 Socioeconomic Status groups of Santiago's districts.

Comuna	ABC1	C2	C3	D	E	Classification
La Pintana	0.5%	5.0%	20.8%	54.0%	19.8%	1
Cerro Navia	0.6%	6.4%	23.2%	52.3%	17.5%	1
Lo Espejo	0.6%	7.5%	23.4%	52.7%	15.8%	1
San Ramón	1.1%	8.1%	23.7%	51.2%	15.9%	1
Renca	1.1%	9.1%	24.5%	49.9%	15.3%	1
La Granja	1.6%	10.9%	27.3%	46.8%	13.3%	1
El Bosque	2.6%	12.6%	26.3%	46.2%	12.2%	1
Lo Prado	2.4%	13.3%	27.7%	45.7%	10.9%	1
P. A. Cerda	2.6%	13.4%	26.9%	46.1%	11.0%	1 / 2
Pudahuel	2.8%	14.5%	28.4%	43.0%	11.3%	2
Conchalí	2.6%	14.7%	27.8%	44.2%	10.6%	2
Recoleta	3.0%	15.5%	26.8%	43.2%	11.5%	2
San Joaquín	3.4%	15.5%	28.0%	42.7%	10.4%	2
San Bernardo	4.2%	14.8%	25.5%	42.4%	13.2%	2
Quinta Normal	3.3%	16.1%	28.6%	41.6%	10.3%	2
Cerrillos	4.3%	16.8%	26.7%	41.6%	10.6%	2
Puente Alto	4.3%	19.8%	31.8%	36.9%	7.2%	2
Quilicura	4.5%	19.9%	31.9%	36.6%	7.0%	2
Estación Central	5.7%	19.2%	28.1%	38.0%	9.0%	2
Independencia	6.2%	22.4%	30.3%	34.6%	6.4%	3
Maipú	7.5%	27.2%	32.7%	28.6%	4.0%	3
La Cisterna	8.7%	23.8%	29.1%	31.5%	6.8%	3
Santiago	9.7%	31.7%	29.3%	24.4%	4.9%	3
Huechuraba	9.8%	11.0%	20.9%	44.6%	13.7%	3
Peñalolén	11.1%	14.0%	21.3%	41.1%	12.5%	3
La Florida	11.7%	25.0%	26.5%	30.5%	6.2%	3
Macul	11.9%	26.0%	25.8%	29.9%	6.5%	3

San Miguel	16.1%	26.2%	26.1%	26.4%	5.2%	3
Lo Barnechea	43.2%	14.3%	14.0%	22.2%	6.3%	3 / 4
Ñuñoa	28.7%	35.1%	20.0%	14.5%	1.8%	4
La Reina	40.6%	26.5%	16.5%	13.7%	2.7%	4
Providencia	35.9%	38.3%	18.2%	7.0%	0.6%	4
Las Condes	48.6%	30.7%	12.9%	6.8%	0.9%	4
Vitacura	58.6%	28.5%	9.8%	2.8%	0.3%	4

Source: Own elaboration base on statistical data of Adimark (2004)

I.6 Police reports of high-social-impact crimes in Santiago's districts, 2005 - 2015

Santiago's Districts sorted according to socioeconomic status groups, 2005 - 2015												
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	% Var. periodo
La Pintana	1782,0	2004,1	2286,8	2127,8	1784,4	1870,2	2196,3	1944,1	1849,5	2004,3	1986,1	11,5%
Cerro Navia	1400,1	1138,2	1371,6	1416,2	1481,7	1494,4	1770,2	1723,9	1579,1	1820,6	1737,6	24,1%
Lo Espejo	2223,9	2036,2	2437,0	2606,1	2435,4	2103,8	2439,4	2336,1	2516,2	2736,7	2729,9	22,8%
San Ramón	1890,7	1845,9	2539,4	2323,5	2192,6	2051,5	2411,1	2074,4	2234,4	2651,0	2896,6	53,2%
Renca	2287,3	2526,5	2741,0	2171,3	2346,8	2238,7	2820,6	2367,0	2652,7	2720,3	2540,5	11,1%
La Granja	2482,9	2673,7	2810,9	2445,6	2338,9	2145,9	2726,0	2237,5	2191,5	2581,8	2619,2	5,5%
El Bosque	2044,9	2160,4	2184,4	2142,4	2102,9	2085,0	2386,8	2158,4	2061,7	2229,6	2340,9	14,5%
Lo Prado	2218,7	1989,2	2224,7	2349,1	2525,8	2372,4	2549,5	2283,3	2381,5	2398,2	2221,5	0,1%
P. A. Cerda	4588,1	4644,8	5336,6	4917,1	5068,2	5779,6	5849,8	4655,7	5328,4	5774,2	6034,9	31,5%
Pudahuel	1358,0	1331,4	1648,1	1775,8	1824,7	1798,0	2096,1	1929,4	2078,6	2126,1	1910,2	40,7%
Conchalí	2342,1	2712,4	2668,4	2784,4	3001,9	2542,5	2607,1	2673,1	2973,6	3335,6	2928,1	25,0%
Recoleta	3584,4	3936,3	4662,8	4523,9	4939,3	4763,4	5169,2	5706,7	6130,6	5930,4	5842,0	63,0%
San Joaquín	2827,1	2949,4	3515,7	3170,6	3135,4	3076,7	3076,1	2809,9	2990,6	3375,0	3233,4	14,4%

San Bernardo	2339,0	2356,9	2831,9	2909,2	2812,8	2695,1	2752,4	2662,6	2898,8	2997,3	2878,0	23,0%
Quinta Normal	2146,4	2072,2	2812,4	3234,8	3853,8	3532,6	4119,5	4141,3	4271,1	5013,5	4935,5	129,9%
Cerrillos	4262,9	4174,1	4856,4	4710,0	4312,2	4435,8	5250,9	5116,3	5134,7	5261,7	4956,5	16,3%
Puente Alto	1443,7	1556,8	1615,1	1612,3	1549,7	1656,7	1868,5	1698,1	1618,5	1707,0	1699,6	17,7%
Quilicura	2516,0	2316,9	2433,0	2263,3	2185,5	2202,9	2417,1	2169,8	2167,0	2369,8	2088,7	-17,0%
Est. Central	4131,4	4273,5	4934,5	5230,0	5195,6	5558,7	5845,0	5860,9	6499,3	7073,9	6918,5	67,5%
Independencia	3378,9	3957,8	4661,2	4756,6	5037,0	5403,3	5417,6	5003,6	5835,5	6346,5	6435,9	90,5%
Maipú	1346,9	1290,9	1379,2	1412,8	1462,3	1316,2	1474,6	1215,4	1170,6	1178,7	1080,6	-19,8%
La Cisterna	3637,1	3714,2	4535,1	4366,8	4388,6	4228,9	4726,8	4322,1	4624,8	5140,3	5527,7	52,0%
Huechuraba	2343,5	2695,9	3096,8	3015,7	3011,1	3050,3	3646,2	3419,9	3814,3	3891,7	3900,6	66,4%
Peñalolén	2164,0	2180,3	2146,6	2191,9	2040,0	1916,8	2249,6	1812,7	1900,9	2077,1	2182,3	0,8%
La Florida	2704,3	2685,2	2977,2	2748,0	2863,7	2705,8	3130,4	2673,2	2872,8	2905,8	3080,5	13,9%
Macul	2099,3	2270,6	2620,2	2720,9	3047,3	2742,2	3051,8	2609,9	2879,4	3258,3	3658,2	74,3%
San Miguel	4518,6	4794,4	5800,7	5600,4	5692,7	5621,5	6113,7	5832,0	6263,9	7151,3	7179,9	58,9%
Lo Barnechea	2801,3	2749,0	2876,1	2583,8	2730,8	2491,3	2946,1	2863,8	2739,7	2957,9	2503,4	-10,6%
Ñuñoa	4588,1	4644,8	5336,6	4917,1	5068,2	5779,6	5849,8	4655,7	5328,4	5774,2	6034,9	31,5%
La Reina	3143,9	3083,5	3103,0	3250,1	3310,2	3493,6	3622,4	3515,7	3836,8	4134,8	4344,5	38,2%
Providencia	8503,9	8482,5	8650,8	9074,2	8919,1	9504,2	10685,9	9967,0	11364,6	11067,8	11031,6	29,7%
Las Condes	3730,7	3519,6	3778,5	3759,8	3847,5	4200,5	4503,4	3884,8	4092,9	3792,3	3659,0	-1,9%
Vitacura	4791,9	4253,1	4299,0	4778,4	4987,7	6227,4	7157,9	6363,7	6680,9	6547,4	6326,5	32,0%
City mean*	**2958,2**	**3000,6**	**3368,8**	**3330,0**	**3378,6**	**3426,8**	**3785,7**	**3475,4**	**3726,2**	**3949,4**	**3922,5**	**32,6%**
Santiago	10276,4	11969,6	13636,8	13642,3	14623,9	14064,1	15006,8	14696,8	16624,3	17748,2	19223,2	87,1%

* This average was estimated leaving the Santiago commune out because its high rates distort the average.
Source: Fuente: Own elaboration base on statistical data of Subsecretaría de Prevención del Delito (2016).

I.7 Police reports of property crimes in Santiago's districts, 2005 - 2015

Santiago's Districts sorted according to socioeconomic status groups, 2005 - 2015												
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	% Var. Periodo
La Pintana	675,5	737,1	856,5	847,7	718,4	853,8	1014	929	876,9	967,6	979,1	44,9%
Cerro Navia	611	529,2	629,9	617,1	602,5	685,8	818,3	864,6	773,7	924	876	43,4%
Lo Espejo	888,3	912,8	1060,4	1134	1120,9	965,1	1197	1220,9	1432,4	1553,5	1557,9	75,4%
San Ramón	836,9	764,9	1037,7	1060,6	1050,7	1113,5	1269,8	1219,4	1264,1	1589,6	1773,8	111,9%
Renca	1151,8	1141,9	1197	963	1164	1236,1	1537,2	1312,4	1430	1466,4	1360,8	18,1%
La Granja	1009,7	1082,4	1163,9	1053,9	1077,5	1119,3	1457	1238,6	1196,1	1432,6	1453,3	43,9%
El Bosque	915	979,2	928	882,7	961,8	1041,6	1293,5	1214,9	1172,7	1297,3	1413,5	54,5%
Lo Prado	1097,4	969,9	1036	1211,5	1327,8	1314,2	1426,3	1405,9	1449,5	1448,4	1258,5	14,7%
P. A. Cerda	3608,3	3490,4	4063,1	3750,5	4040,7	4823,6	4768,6	3808	4389,1	4716,1	4901,4	35,8%
Pudahuel	731,7	748,8	878,3	862,1	990,9	1042,3	1239,2	1248,1	1348,9	1363,7	1124,3	53,7%
Conchalí	1143,4	1439	1304,4	1356,6	1707,4	1426	1439,7	1539,7	1701,4	1952,3	1678,2	46,8%
Recoleta	2236,8	2494,5	2851,5	2881,2	3179,6	3062,5	3295,9	3691,1	3994	3769,8	3689,9	65,0%
San Joaquín	1556,8	1583,3	1766,1	1741,6	1756,8	1854,4	1967	1865,7	1983,7	2257,9	2122,8	36,4%
San Bernardo	1116,8	1200,8	1425,7	1486	1554,1	1585,5	1673,3	1726,4	1849	1860,3	1823,7	63,3%
Quinta Normal	1233	1190,4	1594,2	1871,2	2330,8	2273,6	2428,9	2637,5	2661,5	3248,9	3227,4	161,8%
Cerrillos	2494,9	2400,5	2813,5	2856,1	2536,2	2786,7	3292	3400,1	3603	3709,2	3434	37,6%
Puente Alto	771,7	816,9	844,8	840,1	852,9	1010,7	1131,5	1075,1	1042,8	1099	1065,4	38,1%
Quilicura	1382,6	1191,9	1346,6	1348,3	1230,5	1352	1417,8	1352,3	1390,4	1574,5	1395,5	0,9%
Est. Central	2420,8	2511,5	2812,7	3083,7	3222	3784,3	4083,2	4192,6	4636,9	5024	4926,3	103,5%
Independencia	2049,9	2446,2	2792,9	3017,2	3330,8	3647,2	3572,8	3205,6	4021,4	4324,2	4144,5	102,2%
Maipú	768,9	717,3	770,1	772,1	882,3	819,9	937,8	791,2	782,5	786,8	711,3	-7,5%
La Cisterna	1955,2	2045,9	2494,7	2586,5	2607,6	2684	3068,2	2762,2	2991,1	3436,8	3361,6	71,9%
Huechuraba	1494	1659,4	1989,4	1926,9	1947,4	2199,5	2599,1	2628,7	2744,3	2817,6	2870,2	92,1%
Peñalolén	1188,4	1205,8	1195	1175,3	1151,5	1179,3	1394,5	1187,4	1238,2	1388,6	1511,2	27,2%
La Florida	1527,3	1456,8	1709,1	1623,8	1787,4	1773,6	2120,2	1836,5	2009,2	2048,5	2142	40,2%
Macul	1313,7	1348,4	1619	1656,5	2112,1	1980,7	2153,4	1887,8	2004,4	2404,1	2712,3	106,5%
San Miguel	7357,2	8611,9	9771,9	9972,4	11134,2	10773,4	11500,3	11619	13200,3	13944,1	15134,8	105,7%

Lo Barnechea	3030,7	3235,1	3700	3710,1	3976,6	4139,5	4585,6	4428,3	4810,1	5348,7	5345,2	76,4%
Ñuñoa	2048,5	2085,6	2135,2	1863,8	2116,5	2010,5	2432,6	2435,7	2324	2475	1925,2	-6,0%
La Reina	3608,3	3490,4	4063,1	3750,5	4040,7	4823,6	4768,6	3808	4389,1	4716,1	4901,4	35,8%
Providencia	2459,5	2400,7	2352,2	2459,5	2651,4	2865	2984,8	3005,2	3245,5	3618,2	3732,1	51,7%
Las Condes	7234	7094,7	6971,4	7549	7365,8	8109,7	9065,6	8674,4	9840,8	9611,9	9436,8	30,5%
Vitacura	3264,5	3062,7	3252,7	3235,8	3371,5	3721,1	4025,5	3527,5	3725,7	3415	3213,4	-1,6%
City mean *	**1975,2**	**2031,7**	**2255,4**	**2277,2**	**2421,3**	**2547,2**	**2786,6**	**2658,8**	**2894,6**	**3078,5**	**3066,8**	**55,3%**
Santiago	7.357,2	8.611,9	9.771,9	9.972,4	11.134,2	10.773,4	11.500,3	11.619,0	13.200,3	13.944,1	15.134,8	105,7%

* This average was estimated leaving the Santiago commune out because its high rates distort the average.
Source: Fuente: Own elaboration base on statistical data of Subsecretaría de Prevención del Delito (2016).

I.8 Police reports of violent crimes in Santiago's districts, 2005 - 2015

Santiago's Districts sorted according to socioeconomic status groups, 2005 - 2015												
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	% Var. Periodo
La Pintana	1106,5	1267,0	1430,3	1280,2	1066,0	1016,4	1182,3	1015,1	972,6	1036,7	1007,0	-9,0%
Cerro Navia	789,1	608,9	741,7	799,1	879,1	808,6	951,9	859,3	805,4	896,6	861,6	9,2%
Lo Espejo	1335,6	1123,4	1376,6	1472,1	1314,5	1138,7	1242,4	1115,2	1083,7	1183,2	1172,0	-12,2%
San Ramón	1053,8	1081,0	1501,7	1262,9	1141,9	938,0	1141,3	854,9	970,3	1061,4	1122,7	6,5%
Renca	1135,5	1384,7	1544,0	1208,3	1182,8	1002,6	1283,3	1054,6	1222,7	1254,0	1179,7	3,9%
La Granja	1473,2	1591,3	1647,0	1391,6	1261,4	1026,5	1269,0	998,9	995,5	1149,1	1165,9	-20,9%
El Bosque	1129,8	1181,2	1256,4	1259,7	1141,1	1043,4	1093,3	943,5	889,0	932,3	927,4	-17,9%
Lo Prado	1121,3	1019,4	1188,7	1137,6	1198,0	1058,2	1123,2	877,3	932,0	949,8	963,0	-14,1%
P. A. Cerda	979,8	1154,4	1273,5	1166,5	1027,4	956,0	1081,2	847,7	939,3	1058,1	1133,4	15,7%
Pudahuel	626,4	582,7	769,8	913,7	833,8	755,7	856,8	681,3	729,8	762,3	785,9	25,5%
Conchalí	1198,7	1273,4	1363,9	1427,9	1294,5	1116,6	1167,4	1133,5	1272,2	1383,3	1249,9	4,3%
Recoleta	1347,5	1441,8	1811,3	1642,6	1759,7	1700,9	1873,3	2015,6	2136,6	2160,6	2152,1	59,7%
San Joaquín	1270,3	1366,1	1749,6	1428,9	1378,6	1222,4	1109,0	944,2	1006,9	1117,0	1110,6	-12,6%
San Bernardo	1222,2	1156,1	1406,2	1423,2	1258,7	1109,6	1079,1	936,2	1049,7	1137,0	1054,2	-13,7%
Quinta Normal	913,4	881,8	1218,3	1363,6	1522,9	1259,0	1690,6	1503,8	1609,6	1764,6	1708,1	87,0%
Cerrillos	1768,1	1773,5	2042,9	1853,9	1776,0	1649,1	1958,9	1716,2	1531,7	1552,5	1522,5	-13,9%

Puente Alto	672,0	739,9	770,2	772,1	696,8	646,0	737,0	623,1	575,7	608,0	634,2	-5,6%
Quilicura	1133,4	1125,1	1086,4	915,0	955,1	850,9	999,2	817,5	776,6	795,4	693,1	-38,8%
Est. Central	1710,5	1762,0	2121,9	2146,3	1973,6	1774,4	1761,8	1668,3	1862,4	2049,9	1992,3	16,5%
Independencia	1328,9	1511,6	1868,4	1739,4	1706,2	1756,1	1844,9	1798,0	1814,1	2022,3	2291,4	72,4%
Maipú	577,9	573,5	609,1	640,7	580,0	496,3	536,8	424,1	388,1	391,9	369,3	-36,1%
La Cisterna	1681,9	1668,3	2040,4	1780,3	1781,0	1544,9	1658,7	1559,8	1633,8	1703,5	2166,1	28,8%
Huechuraba	849,5	1036,5	1107,4	1088,8	1063,6	850,8	1047,1	791,2	1070,0	1074,1	1030,4	21,3%
Peñalolén	975,6	974,5	951,7	1016,6	888,5	737,5	855,1	625,3	662,8	688,5	671,1	-31,2%
La Florida	1177,0	1228,4	1268,1	1124,1	1076,2	932,2	1010,2	836,7	863,7	857,4	938,5	-20,3%
Macul	785,6	922,3	1001,2	1064,3	935,2	761,5	898,4	722,1	875,0	854,2	945,8	20,4%
San Miguel	1487,8	1559,2	2100,7	1890,3	1716,0	1482,1	1528,1	1403,7	1453,8	1802,6	1834,7	23,3%
Lo Barnechea	752,8	663,3	740,9	720,0	614,3	480,8	513,5	428,1	415,6	482,9	578,2	-23,2%
Ñuñoa	979,8	1154,4	1273,5	1166,5	1027,4	956,0	1081,2	847,7	939,3	1058,1	1133,4	15,7%
La Reina	684,3	682,7	750,8	790,6	658,7	628,7	637,6	510,5	591,3	516,6	612,5	-10,5%
Providencia	1269,9	1387,8	1679,4	1525,2	1553,4	1394,5	1620,3	1292,6	1523,8	1455,8	1594,8	25,6%
Las Condes	466,2	456,9	525,9	524,0	475,9	479,4	477,9	357,3	367,2	377,3	445,6	-4,4%
Vitacura	445,6	394,7	478,8	460,9	452,9	409,9	523,8	504,0	500,6	659,2	859,6	92,9%
City mean*	**1074,2**	**1113,0**	**1293,8**	**1224,1**	**1157,3**	**1029,8**	**1146,5**	**991,1**	**1044,3**	**1115,0**	**1148,7**	**6,9%**
Santiago	2919,1	3357,6	3864,8	3669,8	3489,8	3290,7	3506,5	3077,8	3423,9	3804,2	4088,4	40,1%

* This average was estimated leaving the Santiago commune out because its high rates distort the average.

Source: Fuente: Own elaboration base on statistical data of Subsecretaría de Prevención del Delito (2016).

APPENDIX II (from Chapter IV)

II.1 List of latent concepts and observational variables

Variable (Latent concept)	**Description** (Observational variables)	**Categories**	**Measurement Level**	**Level of explanation**
Dependent variables				
Violent victimization	Household victimized by violent crimes, within the neighbourhood.	0) No 1) Yes	Categorical - Binary	Individual
Property victimization	Household victimized by property crime, within the neighbourhood.	0) No 1) Yes	Categorical - Binary	Individual
Independent – Control variables				
Female household head	Whether the household head is a woman.	0) No 1) Yes	Categorical - binary	Individual
Presence of child at home	Whether there is at least one child among the family members.	0) No 1) Yes	Categorical - binary	Individual
Child's out school	Whether any child is out of the school 'formal' system.	0) No 1) Yes	Categorical - binary	Individual
Education level of the household head	Educational level of the household head, codified in three categories.	1) Primary or without education (0-8 years) 2) Secondary (9-12) 3) Higher education (13 or more)	Categorical - ordinal	Individual
Main activity of the household head	The main activity of the household head, codified in four categories.	1) Occupied 2) Unemployed 3) Retired 4) Inactive (student, housewife or disabled)	Categorical - nominal	Individual
Working position of the household head	The working position of the household head, codified in six categories.	1) Manager 2) Self-employee 3) Employee 4) Unemployed 5) Retired 6) Inactive	Categorical - nominal	Individual

New family income (after missing imputation)	The family income, codified in five categories.	1) $0 – US$490 2) $491 - $784 3) $785 - $1960 4) $1961 or more	Categorical – ordinal	Individual

Variable (Latent concept)	**Description** (Observational variables)	**Categories**	**Measurement Level**	**Level of explanation**
Independent - Mediating variables				
Income dependency	The income dependency (proportion between working household members and household members), codified in four categories.	1) High level 2) Medium level 3) Low level 4) Very low level	Categorical - ordinal	Individual
Unstable dwellings	Whether the family lives in an irregular property without pay mortgage or rent.	0) No 1) Yes	Categorical - binary	Individual
Overcrowded house	Whether there are more than 2.5 persons sleeping in the same room.	0) No 1) Yes	Categorical - binary	Individual
Length of residence	The number of years that the respondent (and their family) has lived in the same neighbourhood.	1) Low (0 - 5.5 years) 2) Medium (6 - 19.5) 3) High (20 - 35.5) 4) Very-high (36 or more)	Categorical - ordinal	Individual
Feelings toward neighbourhood	Scale of feelings towards the local community or neighbourhood, from strongly disagree to strongly agree.	Feelings toward neighbourhood	Continuous	Individual & Neighb.
Informal networks	Scale of social interactions and scale of collaboration, both measured from never to always.	Factor of social interactions Factor of collaboration	Continuous	Individual & Neighb.
Formal networks	Respondent participation in local organizations, the existence of local leaders and the existence of local organization of security issues (yes, no).	These variables were dismissed in the EFA and they were not included in final regression models		

Social Cohesion	Scale of trust and scale of cohesion, both measured from strongly disagree to strongly agree.	Factor of social cohesion	Continuous	Individual & Neighb.
Informal control	Scale of informal control, from very unlikely to very likely.	Factor of informal control	Continuous	Individual & Neighb.
Public control	Evaluation of police response to community calls, from very unlikely to very likely. And evaluation of municipality services provided to community, from very bad to very good.	Factor of perception of police Factor of perception of municipality	Continuous	Individual & Neighb.
Police-community nexus	Community knowledge about: Carabineros office (preventive police); Investigative police office; Officer assigned to neighbourhood; Meetings between police and community.	Factor of police-community nexus	Continuous	Individual & Neighb.

List of latent concepts and observational variables (Continuation)

Independent - Exogenous				
Neighbourhood concentration of poverty	Percentages of families which are from the working class and the lower socioeconomic status (in Chile D-E status)*.	Count	Continuous	Neighb.
The mean of residential stability	The aggregated measured (or mean) of the length of household residence in the same neighbourhood.	Count	Continuous	Neighb.
*The survey company established the composition of the micro-neighbourhood respect to the percentage of families within upper class (ABC1), Upper-middle (C2), Lower-middle (C3), Working class (D) and Lower class (E).				

APPENDIX III (from Chapter V)

III.1 Polychoric Correlation Matrix: Informal networks variables

		Feelings toward Neighborhood					Friendship ties	
		p26_1	p26_2	p26_3n	p26_4	p26_5n	Gfriends	Frfriend
Feelings toward neighborhood	p26_1	1						
	p26_2	0.57	1					
	p26_3n	0.32	0.25	1				
	p26_4	0.52	0.51	0.13	1			
	p26_5n	0.22	0.14	0.56	0.12	1		
Friendship ties	Gfriends	0.06	0.01	0.00	0.09	-0.01	1	
	Frfriend	0.05	0.00	0.02	0.05	0.00	0.69	1
Social Interactions	p67_1	0.28	0.20	0.10	0.26	0.10	0.13	0.14
	p67_2	0.24	0.20	0.10	0.25	0.08	0.13	0.17
	p67_3	0.18	0.12	0.04	0.18	0.02	0.13	0.15
	p67_4	0.21	0.12	0.05	0.19	0.04	0.13	0.15
	p67_5	0.13	0.09	-0.01	0.09	-0.05	0.11	0.11
Collaboration	p68_1	0.07	0.05	-0.08	0.04	-0.09	0.10	0.09
	p68_2	0.04	0.03	-0.11	0.03	-0.11	0.12	0.09
	p68_3	0.13	0.12	0.01	0.11	-0.03	0.12	0.13
	p68_4	0.19	0.14	0.05	0.18	0.01	0.14	0.15
	p68_5	0.18	0.13	0.04	0.23	0.07	0.16	0.18

	Social Interactions					Collaboration				
	p67_1	p67_2	p67_3	p67_4	p67_5	p68_1	p68_2	p68_3	p68_4	p68_5
p67_1	1									
p67_2	0.77	1								
p67_3	0.66	0.80	1							
p67_4	0.62	0.68	0.74	1						
p67_5	0.45	0.58	0.68	0.72	1					
p68_1	0.23	0.28	0.35	0.36	0.49	1				
p68_2	0.24	0.29	0.37	0.33	0.43	0.62	1			
p68_3	0.27	0.31	0.35	0.35	0.38	0.58	0.62	1		
p68_4	0.32	0.35	0.38	0.41	0.40	0.55	0.54	0.78	1	
p68_5	0.44	0.46	0.48	0.51	0.39	0.45	0.45	0.53	0.66	1

III.2 Polychoric Correlation Matrix: Trust, Cohesion and Informal Control

		Trust					Cohesion				
		p84_1	p84_2	p84_3	p84_4	p84_5	p85_1	p85_2	p85_3	p85_4	p85_5
Trust	p84_1	1									
	p84_2	0.23	1								
	p84_3	0.38	0.33	1							
	p84_4	0.13	0.51	0.19	1						
	p84_5	0.21	0.55	0.25	0.65	1					
Cohesion	p85_1	0.17	0.40	0.20	0.38	0.46	1				
	p85_2	0.20	0.07	0.22	0.04	0.07	0.01	1			
	p85_3	0.20	0.43	0.32	0.41	0.48	0.59	0.02	1		
	p85_4	0.26	0.17	0.24	0.14	0.17	0.13	0.27	0.12	1	
	p85_5	0.18	0.41	0.32	0.40	0.49	0.52	-0.02	0.66	-0.02	1
Informal control	p89_1	0.05	0.12	-0.04	0.15	0.15	0.21	-0.09	0.12	-0.08	0.11
	p89_2	0.12	0.19	0.06	0.22	0.22	0.21	-0.08	0.20	-0.03	0.17
	p89_3	0.16	0.20	0.09	0.22	0.23	0.17	-0.05	0.21	-0.01	0.20
	p89_4	0.11	0.17	0.08	0.17	0.22	0.16	-0.06	0.19	-0.05	0.21
	p89_5	0.15	0.21	0.13	0.22	0.25	0.15	-0.02	0.23	0.02	0.22
	p89_6	0.16	0.18	0.09	0.20	0.22	0.24	0.03	0.20	0.03	0.19
	p89_7	0.21	0.28	0.23	0.29	0.32	0.20	0.02	0.30	0.03	0.33

Informal Control							
	p89_1	p89_2	p89_3	p89_4	p89_5	p89_6	p89_7
p89_1	1						
p89_2	0.74	1					
p89_3	0.59	0.71	1				
p89_4	0.57	0.61	0.70	1			
p89_5	0.49	0.59	0.66	0.70	1		
p89_6	0.56	0.58	0.60	0.59	0.67	1	
p89_7	0.40	0.51	0.61	0.61	0.68	0.66	1

III.3 Polychoric Correlation Matrix: Public Control variables

	Perceptions of Police		Perceptions of Municipality services				Police-community nexus			
	p31_2	p31_3	p49_1	p49_2	p49_5	p49_6	Police1	Police2	Police3	Police4
p31_2	1									
p31_3	0.75	1								
p49_1	0.20	0.18	1							
p49_2	0.20	0.20	0.66	1						
p49_5	0.20	0.19	0.65	0.62	1					
p49_6	0.23	0.26	0.58	0.62	0.70	1				
Police1	-0.06	-0.11	-0.05	-0.03	-0.01	-0.07	1			
Police2	-0.02	0.02	0.04	0.03	0.06	0.08	0.51	1		
Police3	0.13	0.11	0.09	0.11	0.14	0.16	0.26	0.22	1	
Police4	0.11	0.07	0.08	0.07	0.07	0.11	0.26	0.49	0.55	1

APPENDIX IV (from Chapter VI)

IV.1 Logistic regression models by groups of variables

	Violent Victimization			Property Victimization		
Variables household level	M1	M1b	M1c	M1	M1b	M1c
Female household head (yes)	1.17			1.18		
Children at home (yes)	1.81**			1.31*		
Child's out school (yes)	1.00			1.02		
Education of household head (ref. primary or without education)						
Secondary education		1.58**			1.04	
Higher education		1.44+			1.19	
Working position of household head (ref. Inactive)						
Manager		1.87**			0.91	
Self-employee		2.10**			1.49*	
Employee		1.89**			1.13	
Unemployed		1.77+			1.58	
New family income (ref.$1961 or +)						
0 - US $490		1.26			0.82	
$491 – 784		0.98			0.78	
$785 – 1177		1.15			1.10	
$1178 - 1960		1.05			0.98	
Level of income dependency (ref. very low dependency)						
High level		1.32			1.75**	
Medium level		1.37+			1.85**	
Low level		1.12			1.65**	

Irregular dwellings (yes)			1.45*			1.31
Overcrowded house (yes)			1.12			0.78
Length of residence (ref. very-high)						
Low (0 - 5.5 years)			2.09**			1.65**
Medium (6 - 19.5)			2.23**			1.56**
High (20 - 35.5)			1.59**			1.41*
LR Chi-square (sig.)	28.9**	50.2**	38.2**	7.5	34.8*	15.1*
Pseudo R Square	0.011	0.02	0.014	0.003	0.013	0.006
Number of observations	5816	5681	5748	5845	5707	5776

IV.2 Comparative Models of Household Violent Victimization: Logistic and Probit regression

Variables household level	Logistic regression of violent victimization (exp b)		Probit regression of violent victimization (exp b)	
Female household head (yes)	1.26*	0.16	1.11+	0.06
Children at home (yes)	1.55**	0.24	1.23**	0.07
Child's out school (yes)	0.94	0.18	0.96	0.09
Education of household head (ref. higher education)				
Primary education (or without)	1.50**	0.23	1.22**	0.07
Secondary education	1.34	0.29	1.15	0.10
Working position of household head (ref. Inactive)				
Manager	1.56*	0.33	1.23*	0.10
Self-employee	1.78**	0.32	1.31**	0.09
Employee	1.50*	0.26	1.20*	0.08
Unemployed	1.49	0.49	1.20	0.16
New family income (ref.$1961 or +)				
0 - US $490	1.22	0.43	1.10	0.17
$491 – 784	0.97	0.33	0.99	0.16
$785 – 1177	1.17	0.40	1.07	0.17
$1178 - 1960	1.05	0.39	1.02	0.18
Income dependency (ref. very low)				
High level	0.90	0.19	0.95	0.10
Medium level	1.03	0.20	1.02	0.09
Low level	0.87	0.19	0.94	0.10
Irregular dwellings (yes)	1.35*	0.22	1.16*	0.08
Overcrowded house (yes)	0.91	0.17	0.96	0.09
Length of residence (ref. very-high)				
Low (0 - 5.5 years)	1.60*	0.31	1.24*	0.09
Medium (6 - 19.5)	1.70**	0.32	1.28**	0.09

High (20 - 35.5)	1.38	0.25	1.15	0.08
LR Chi-square(19) (sig.)	77.3	(0.00)	77.4	(0.00)
Pseudo R Square	0.03		0.03	
Number of observations	5630		5630	

APPENDIX V (from Chapter VII)

V.1 Mixed effects logistic models of Violent Victimization based on SDT hypothesis

Mixed effects logistic models of violent victimization, table of Odds Ratio					
Fixed Effects (a)	M4 (f1)	M4 (f2)	M4 (f3)	M4 (f4)	M4 full
Predictor variables (individual level)					
Feelings toward neighbourhood (f1)	0.77**				0,83**
Social interactions (f2)		0.78**			0,90
Collaboration (f3)			0.73**		0,81*
Friendship ties (f4)				0.97	1,07
Predictor variables (neighbourhood)					
Mean Feelings toward neighbourhood (f1)	0.78**				0,84+
Mean social interactions (Mf2)		0.80**			0,86
Mean collaboration (Mf3)			0.87		0,95
Mean friendship ties (Mf4)				1.05	1,14
Concentration of poverty	1.13	1.22*	1.20*	1.19*	1,13
Mean of residential stability	1.00	0.97	0.95	0.95	0,99
Random effects					
L2 variance (ψ): Between MN	0.42	0.44	0.46	0.44	0.43
ICC (ρ)	11.5%	11.5%	11.7%	11.7%	11.6%
Reliability test	0.76	0.76	0.76	0.76	0.76
Log likelihood	-1233.0	-1232.7	-1232.4	-1240.6	-1225,0
Number of obs. / N groups	5670/242	5670/242	5670/242	5670/242	5670/242
Min. obs. per group / Mean	12 / 23	12 / 23	12 / 23	12 / 23	12 / 23
(a) The most significant control variables were tested in all models but they were not included in this table. * p-value < 0.05, ** p-value < 0.01, + p-value < 0.1.					

V.2 Mixed effects logistic models of Violent Victimization based on CET hypotheses

Mixed effects logistic models of violent victimization, table of Odds Ratio					
Fixed Effects (a)	M5	M6 (f5f6)	M6 (f7)	M6 full	M7
Predictor variables (individual level)					
Feelings toward neighbourhood (f1)	0.82**				0.84*
Collaboration (f3)	0.77**				0.83*
Social Cohesion (f5f6)	-	0.76**		0.81**	0.91
Informal Control (f7)	-		0.77**	0.85+	0.87+
Predictor variables (neighbourhood)					
Mean of feelings toward neighbourhood (f1)	0.80*				0.87
Mean collaboration (Mf3)	0.91				0.99
Mean Social Cohesion (f5f6)		0.75**		0.78**	0.82+
Mean Informal Control (f7)			0.84*	0.93	0.94
Concentration of poverty	1.12	1.16+	1.20*	1.16+	1.12
Mean of residential stability	1.00	1.00	0.95	1.00	1.01
Random effects					
L2 variance (ψ): Between MN	0.44	0.43	0.44	0.43	0.43
ICC (ρ)	11.8%	11.5%	11.8%	11.5%	11.6%
Reliability test	0.76	0.76	0.76	0.76	0.76
Log likelihood	-1231.6	-1230.3	-1233.9	-1234.0	-1227.0
Number of obs. / N groups	5670/242	5,663 / 242	5,663 / 242	5663/242	5663/242
Min. obs. per group / Mean	12 / 23	12 / 23	12 / 23	12 / 23	12 / 23

(a) The most significant control variables were tested in all models but they were not included in this table.
* p-value < 0.05, ** p-value < 0.01, + p-value < 0.1.

V.3 Mixed effects logistic models of Violent Victimization based on Public Control hypotheses

Mixed effects logistic models of violent victimization, table of Odds Ratio						
Fixed Effects(a)	M8	M9 (f8)	M9 (f9)	M9 (f10)	M9 full	M10
Predictor variables (individual level)						
Collaboration (f3)	0.81**					0.83*
Social Cohesion (f5f6)	0.87+					0.89
Informal Control (f7)	0.87					0.87+
Perception of police (f8)	-	0.81**			0.83**	0.84*
Perception of municipality (f9)	-		0.81**		0.84*	0.91
Police-community nexus (f10)	-			1.12+	1.12	1.15*
Predictor variables (neighbourhood)						
Mean Collaboration (Mf3)	0.97					0.88
Mean Social Cohesion (Mf5f6)	0.79*					0.82*
Mean Informal Control (Mf7)	0.94					0.93
Mean P. of police (Mf8)	-	0.85+			0.81*	0.79*
Mean P. of municipality (Mf9)	-		0.95		0.95	1.03
Mean Police-community (Mf10)	-			1.23*	1.23*	1.27*
Concentration of poverty	1.15	1.16+	1.21*	1.16+	1.17	1.14
Mean of residential stability	1.00	0.96	0.95	0.97	0.97	1.01
Random effects						
L2 variance (ψ): Between MN	0.43	0.43	0.44	0.43	0.42	0.41
ICC (ρ)	11.6%	11.2%	11.8%	11.6%	11.4	11%
Reliability test	0.76	0.75	0.76	0.76	0.75	0.75
Log likelihood	-1230.5	-1235.9	-1237.2	-1235.5	-1230.5	-1222.6
Number of obs. / N groups	5663/242	5,670/ 242	5,670/ 242	5670/242	5670/242	5663/242
Min. obs. per group / Mean	12 / 23	12 / 23	12 / 23	12 / 23	12 / 23	12 / 23

(a) The most significant control variables were tested in all models but they were not included in this table.
* p-value < 0.05, ** p-value < 0.01, + p-value < 0.1.

V.4 Multilevel SEM of Violent and Property Victimization: Null Models and Models with neighbourhood level variables

BETWEEN LEVEL	Violent victimization (coef.)		Property victimization (coef.)	
Structural Model	Null	M1	Null	M1
Random intercept	1.63** (0.04)	1.63** (0.04)	1.67** (0.04)	1.67** (0.04)
Concentration of poverty	-	0.10* (0.04)	-	0.02 (0.04)
Mean of residential stability	-	-0.09* (0.04)	-	-0.01 (0.04)
Correlations				
C. poverty with R. Stability	-	0.37**(0.07)	-	0.37** (0.07)
Between residual variance	0.12** (0.03	0.11**(0.03)	0.16** (0.04)	0.16** (0.04)
Interclass correlation coef.	3.5%	3.2%	4.5%	4.5%
N observations / N groups	5801/242	5860	5827/242	5860/242

V.5 Multilevel SEM of Violent and Property Victimization based on CET and Public Control hypothesis

	Violent victimization (odds ratio)			Property victimization (odds ratio)		
Structural Model (a)	M8	M9	M10	M8	M9	M10
WITHIN LEVEL						
Collaboration (f3)	0.93+		0.93	1.04		1.04
Social cohesion (f5f6)	0.89**		0.90*	0.85**		0.85**
Informal control (f7)	0.95+		0.94*	1.04		1.03
Perception of police (f8)		0.93**	0.94*		0.95*	0.96*
Perception of municipality (f9)		0.93**	0.96		0.95	0.97
Police-community nexus (f10) (b)		1.72+	1.23**		1.76	1.11
BETWEEN LEVEL						
Mean collaboration (Mf3)	1.07		0.99	0.94		0.76*
Mean social cohesion (f5f6)	0.79*		0.80*	0.96		1.09
Mean informal control (f7)	1.00		1.00	1.02		1.02
Mean perception of police (Mf8)		0.93+	0.92*		0.98	0.91
Mean perception municipality (Mf9)		1.00	1.04		0.97	0.99
Mean police-community nexus (Mf10)		1.15	1.09		1.15	1.37*
Concentration of poverty	1.09**	1.09**	1.09**	1.02	1.02	1.02
Mean of residential stability	0.98	0.98	0.98	1.03	1.03	1.03
C. poverty with R. Stability	0.37**	0.37**	0.37**	0.37**	0.37**	0.37**
Random effects						
L2 variance (ψ): Between MN	0.10	0.10	0.09	0.15	0.15	0.12
ICC (ρ)	2.8%	2.9%	2.7%	4.3%	4.4%	3.6%
Reliability test	0.41	0.42	0.39	0.52	0.52	0.47
Chi square test	3200.40 (0.00)	558.95 (0.00)	3964.12 (0.00)	3203.7 (0.00)	574.27 (0.00)	3970.17 (0.00)
Number of obs. / N groups	5711/242	5711/242	5711/242	5711/242	5711/242	5711/242
Average cases per group	23.6	23.6	23.6	23.6	23.6	23.6

* p-value < 0.05, ** p-value < 0.01, + p-value < 0.1

(a) The most significant control variables were tested in models but they were not included in this table. (b) Even if the influence of this variable was significant, at individual level, the outputs of the measurement part of the three models showed that the configuration of this variable is not significant.

MEASUREMENT PART OF THE MODEL 10 (Violent Victimization)					
WITHIN LEVEL					
F3 by		F5 by		F7 by	
P68_1	1.00**	P84_2	1.00**	P89_3	1.00**
P68_2	1.18**	P84_4	1.11**	P89_4	1.15**
P68_3	1.68**	P84_5	1.44**	P89_5	1.20**
P68_4	1.69**	P85_1	1.44**	P89_7	0.98**
		P85_3	1.50**		
		P85_5	1.37**		
F8 by		F9 by		F10 by	
P31_2	1.00**	P49_1	1.00**	Police3	1.00
P31_3	1.02**	P49_2	1.00**	Police4	4.20
		P49_5	1.11**		
		P49_6	1.03**		
BETWEEN LEVEL					
FN3 by		FN5 by		FN7 by	
P68_1	1.00**	P84_2	1.00**	P89_3	1.00**
P68_2	0.80**	P84_4	1.09**	P89_4	0.97**
P68_3	1.57**	P84_5	1.51**	P89_5	0.97**
P68_4	1.57**	P85_1	1.35**	P89_7	1.05**
		P85_3	1.31**		
		P85_5	1.26**		
FN8 by		FN9		FN10	
P31_2	1.00**	P49_1	1.00**	Police3	1.00
P31_3	1.12**	P49_2	1.14**	Police4	2.01
		P49_5	1.11**		
		P49_6	1.25**		
Model fit: CFI 0.97, TLI 0.96, RMSEA 0.03, SRMR within 0.04, SRMR between 0.12. * p-value < 0.05, ** p-value < 0.01, + p-value < 0.1					

V.6 Multilevel SEM of Violent and Property Victimization, direct and indirect effects

	Violent victimization (odds ratio)		Property victimization (odds ratio)	
Structural Model (a)	M10	M11	M10	M11
WITHIN LEVEL				
Collaboration (f3)	0.93	0.95	1.04	1.05
Social cohesion (f5f6)	0.90*	0.91*	0.85**	0.85**
Informal control (f7)	0.94*	0.95	1.03	1.04
Perception of police (f8)	0.94*	0.95*	0.96*	0.96+
Perception of municipality (f9)	0.96	0.97	0.97	0.98
Police-community nexus (f10) (b)	1.23**	-	1.11	-
BETWEEN LEVEL				
Mean collaboration (Mf3)	0.99	1.01	0.76*	0.93*
Mean social cohesion (f5f6)	0.80*	0.87+	1.09	0.93
Mean informal control (f7)	1.00	0.97	1.02	1.02
Mean perception of police (Mf8)	0.92*	0.96	0.91	0.98
Mean perception municipality (Mf9)	1.04	1.01	0.99	0.98
Mean police-community nexus (Mf10)	1.09	-	1.37*	-
Concentration of poverty	1.09**	1.06	1.02	1.01
Mean of residential stability	0.98	1.00	1.03	1.05
C. poverty with R. Stability	0.37**	-	0.37**	-
Random effects				
L2 variance (ψ): Between MN	0.09	0.10	0.12	0.15
ICC (ρ)	2.7%	3.0%	3.6%	4.3%
Reliability test	0.39	0.42	0.47	0.51
Chi square test	3964.12 (0.00)	3430.18 (0.00)	3970.17 (0.00)	3431.92 (0.00)
Number of obs. / N groups	5711/242	5711/242	5711/242	5711/242
Average cases per group	23.6	23.6	23.6	23.6
* p-value < 0.05, ** p-value < 0.01, + p-value < 0.1				

MEDIATING PART OF THE MODEL 11, Correlations and Regressions (coefficients)					
Structural Model	Collaboration	**Social cohesion**	Informal Control	**Perc. Police**	Perc. Municipality
WITHIN LEVEL *(Correlation with)*					
Collaboration	-				
Social cohesion	0.33**	**-**			
Informal control	0.25**	**0.31****	-		
Perc. Pólice	0.19**	**0.16****	0.11**	**-**	
Perc. Municipality	0.25**	**0.21****	0.16**	**0.29****	-
BETWEEN LEVEL *(Regressed on)*					
Concentration of poverty	0.16*	**-0.12****	-0.07	**-0.53****	-0.39**
Mean of residential stability	0.00	**0.14****	-0.07	**0.06**	-0.01
* p-value < 0.05, ** p-value < 0.01, + p-value < 0.1					

MEASUREMENT PART OF THE MODEL 11 (Violent Victimization)					
WITHIN LEVEL					
F3 by		F5 by		F7 by	
P68_1	1.00**	P84_2	1.00**	P89_3	1.00**
P68_2	1.14**	P84_4	1.10**	P89_4	1.16**
P68_3	1.64**	P84_5	1.43**	P89_5	1.21**
P68_4	1.62**	P85_1	1.44**	P89_7	0.98**
		P85_3	1.50**		
		P85_5	1.37**		-
F8 by		F9 by			
P31_2	1.00**	P49_1	1.00**		
P31_3	1.04**	P49_2	1.01**		
		P49_5	1.12**		
		P49_6	1.03**		
BETWEEN LEVEL					
FN3 by		FN5 by		FN7 by	
P68_1	1.00**	P84_2	1.00**	P89_3	1.00**
P68_2	0.80**	P84_4	1.13**	P89_4	1.08**
P68_3	1.20**	P84_5	1.47**	P89_5	1.08**
P68_4	1.08**	P85_1	1.04**	P89_7	0.95**
		P85_3	1.26**		
		P85_5	1.30**		-
FN8 by		FN9			
P31_2	1.00**	P49_1	1.00**		
P31_3	1.06**	P49_2	1.11**		
		P49_5	1.17**		
		P49_6	1.15**		
Model fit: CFI 0.97, TLI 0.97, RMSEA 0.03, SRMR within 0.04, SRMR between 0.18. * p-value < 0.05, ** p-value < 0.01, + p-value < 0.1					