THE SOCIAL CONTEXT OF RESIDENTIAL BURGLARY: EXPLORING NEIGHBORHOOD LEVEL RISK FACTORS IN THE CITY OF BURSA, TURKEY

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ABSTRACT

The Social Context of Residential Burglary: Exploring Neighborhood Level Risk Factors in the City Of Bursa, Turkey

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This doctoral dissertation evaluated neighborhood level social environmental characteristics and their effects on creating residential burglary risk in Bursa, Turkey. In doing so, it follows the social disorganization and environmental criminology frameworks.

The dissertation describes a multi-method study. Quantitative analysis focused on three separate issues. First, Census and police crime data were used in a bivariate and multivariate neighborhood level analysis. Neighborhood level social disorganization measures correlate strongly with the burglary rate. Second, feature environmental geocoded data were obtained and the key variables were treated as risk factors for the Risk Terrain Modeling (RTM) and traditional crime hot spot analysis. RTM is a better predictor of future burglaries when compared to hot spot analysis. Third, 165 neighborhoods of Bursa were coded into 4 categories according to physical structure: shantytowns, single family housing, adjacent type buildings, and multi-family apartment complexes. The neighborhood level burglary risk was regressed on the neighborhood

type. Results indicate that type of neighborhood is significantly related to neighborhood level criminogenic risk.

This dissertation also explored the role of neighborhood's social characteristics by adding field observations of these differing social contexts. The researcher focused on indicators of risk and the social environmental context of four neighborhood types. The study found that single family housing neighborhoods have the lowest risk of residential burglary.

These findings have important implications for interventions in urban settings, providing insights into the role that neighborhood characteristics can have on these encouraging crime and social disorder

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This dissertation is dedicated to my country and my family

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LIST OF ABBREVIATIONS

RTM	Risk Terrain Modeling
GIS	Geographic Information Systems
CCTV	Closed Circuit TeleVision
NCVS	National Crime Victimization Survey
TOKI	Turkish Public Housing Authority
TUIK	Turkish Statistics Institute
RSI	Relative Spatial Influence

CHAPTER 1: INTRODUCTION

Introduction

Burglary, although not regarded as a violent crime, has been one of the most common crimes since people started living together in communities. In the United States, 3.7 million household burglaries are estimated to occur every year, based on the National Crime Victimization Survey (NCVS) (Catalano, 2010). Burglary is still considered as an important phenomenon by scholars, policy makers and law enforcement agencies worldwide. The major characteristics of a burglary make it an important crime category to be dealt with by the police. That is, burglary affects victims both financially and psychologically. Stolen items are usually not recovered; and it is extremely difficult to identify burglary offenders. Even in the absence of material loss, a burglary can still result in emotional trauma. The home, the sanctuary of the victim may be invaded. Thus, the higher the burglary rate, the higher the costs incurred by the society. As a consequence, the topic of residential burglary has been extensively explored by academics in the context of criminological research.

In explaining their interest in burglary, Rengert and Wasilchick (2000) claimed that they were fascinated with the process of burglary and they wondered why one house was burglarized and not the one next door, which seemed equally convenient. Indeed, burglars seem to prefer one neighborhood over another, one house, but not the other. This variation has led scholars to analyze state, city, neighborhood, household, and individual level correlates of burglary. The risk of burglary victimization has been explained by either micro (individual or household), macro (neighborhood, city, or state), or multilevel (household and neighborhood) studies. It is proposed that both micro and macro level risk

factors simultaneously affect burglary victimization. Burglary is a function of the social environmental characteristics of the area along with the attributes of households (Rountree & Land, 2000; Smith & Jarjoura, 1989).

Regardless of what factors it is correlated with, burglary is a direct result of one: burglar's choice. An offender may unknowingly be informed and affected directly or indirectly by social and individual factors, and decide to commit an offense, and may then select an area and a particular house to break in. In this case, the burglary victimization experience is usually a direct product of a burglar's assessment of risk.

From this point of view, the variance in neighborhood burglary rates can be attributed to a burglars' assessment of the involved risk and the target selection. Stated simply, the burglary rates in a certain area might be higher than those in other areas merely because the burglars choose this area thoughtfully. Needless to say, it is unlikely that burglars randomly pick an area or a house they want to break in, rather the social and environmental structure of a particular area leads them to make their decision.

Therefore, although the literature has highlighted the multilevel effects of social context and household characteristics on burglary victimization, and although burglary risk is not equal for every household in any neighborhood, it is still the "attributes of place" that primarily affect the way burglars assess the risk and pick a target (Wright & Decker, 1994).

Understanding the social, and environmental features of a `place` that can create criminogenic opportunities is the first and imminent step in designing preventive programs. Similar to a burglar's *modus operandi*, which involves determining the offending area primarily, the related criminological research and application of

preventive measures have to initially consider the social context in which burglaries occur before focusing on other attributes.

The literature on crime analysis overwhelmingly stresses that crime is not evenly distributed among places, victims, or offenders ((Brantingham & Brantingham, 1981). Crimes cluster in space and time (Johnson et al., 2007; Sherman, Gartin, & Buerger, 1989), and tend to form "hot spots". Crime clusters can cover multiple city blocks, or parts of neighborhoods. They can also be fairly small and concentrated to particular addresses to reflect repeat or near repeat victimization phenomena (Polvi, Looman, Humphries, & Pease, 1991; Townsley, Homel, & Chaseling, 2003).

The notion of crime concentration in time and space has enormous preventive value. Informed by where criminal victimization occurs, policy makers can allocate adequate resources to the areas where they are most needed. In fact, hot spot analysis has been a valuable tool for law enforcement agencies in managing their resources. However, prevention depends primarily on prediction. For predicting probable future clusters of crime, hot spot analysis depends solely on a single factor, namely prior crimes. For instance, in order to provide a police agency with the knowledge of high risk areas of burglary, hot spot analysis utilizes past data on burglaries and may inform us about the particular areas where burglary events are unevenly distributed. Even though criminological theory and years of empirical research have identified numerous risk factors, hot spot analysis takes into account prior burglaries only. The problem (or irony) here is obvious. If prevention succeeds, there will be fewer burglaries, eventually leading to eradication of the single input variable. Not only does this analysis exclude valuable information, but it also diminishes the implementation of effective preventive strategies

by informing policy on how to prevent burglaries using only one risk factor. Better predictions of the future victimization process depend on a better-informed risk analysis.

In order to solve this problem of predicting risk, Caplan and Kennedy (2010) proposed a new approach called Risk Terrain Modeling (RTM). They remind us that risk is a dynamic value linked to a place and it varies by intensity, however unlike the actual crime distribution, the risk of crime is never zero. Every city, neighborhood, or street block can have a risk value, and this is determined and varies as a result of a "nexus of certain factors" (Caplan & Kennedy, 2010). For crime specific studies, these factors are often readily available thanks to the information provided by criminological theory and practice. The Risk Terrain Modeling approach applies these theoretical and empirical findings to practice and allows a better understanding of the social and physical context in which crime occur to emerge. Using risk as a metric, this approach offers a practical way to operationalize and measure several risk factors, thus providing a richer analysis then that used in traditional hot spot analysis.

Purpose of the Study

The social context in which crime occur has always drawn the attention of the researchers. Most notably, early urban studies in the United States (US) highlighted the link between place and crime. The legacy of the Chicago school was followed by social control studies. The opportunities that different places and environments create are studied by many scholars. In this present study, the social context of burglaries was explored. In the simplest terms, the social context was defined as the social life and control created by the attributes of a *neighborhood*. More specifically, the place-based risk of burglary victimization was investigated.

There are two main approaches to explaining neighborhood crime rates in the crime literature. Social disorganization theory addresses the lack of social cohesion and control in a neighborhood, which eventually will diminish the neighborhood's capacity to fight crimes. Routine activities theory stresses the role of opportunity and sees crime as a function of everyday behavior. As the context in which people change, so do the opportunities provided for criminal actions (Cohen & Felson, 1979). In this study, the constructs from these theoretical approaches were utilized to explain the risk of burglary in Bursa neighborhoods.

By using neighborhood level risk factors of burglary derived from Western research and applying the Risk Terrain Modeling approach, this study aimed to investigate how different neighborhoods create varying levels of burglary risk in a fundamentally different social setting, the city of Bursa, Turkey. Bursa is the fourth largest metropolitan in Turkey, located on the south coast of Marmara Sea and northwest of the country. Bursa is an historic city and became the first capital of the Ottoman Empire after it was conquered by the Byzantines in 1326. With a population of over 2,500,000, Bursa is growing day by day since it continuously receives large immigrant populations.

First, this study explored the neighborhood level predictors of residential burglary in Bursa, and determined the neighborhoods that are more susceptible to burglary. Further, the neighborhood specific factors contributing to burglary were explored through risk terrain modeling analysis. Finally, socially different neighborhoods were observed and the burglary risk created by the social environmental features of the place is discussed.

Significance of the Study

Regardless of where and in what social environment they live, human beings do not want outsiders, intruders, or invaders in their sanctuary. Although most often overlooked, burglary harms people seriously. The victims suffer from burglary experience. The offenders are seldom caught. The burglary clearance rate averages 14 percent in the United States and 23 percent in Britain (Weisel, 2002). The society pays a high price. Therefore, it is of high importance to better understand the factors that predict burglaries in different settings, so that neighborhoods or cities can introduce specific preventive measures to counter these incidents.

It would probably be an understatement to claim that crime in Turkish neighborhoods is understudied. The literature specifically lacks empirical research conducted on crime issues in Turkish municipalities. As Sampson (2008) states *"*application of neighborhood studies to other societal contexts is badly needed if we are to make further progress in understanding the generalizability of the link between community social mechanism and crime rates" (p. 162).

Burglary is an important problem for Bursa. In 2007, 2750 residential burglaries were reported to police. Preventing burglaries is a challenge, yet understanding the risk factors and successful forecasting can empower policy makers and practitioners by providing them with valuable information.

Successful policies depend on credible information that is available to public institutions. The information should describe the problem in a way that agencies could act on it. This is the central theme of a relatively new notion, intelligence-led policing. Ratcliffe (2003, p.3) describes it as "the application of criminal intelligence analysis as an

objective decision making tool in order to facilitate crime reduction and prevention through effective policing strategies and external partnership projects drawn from an evidential base". Caplan and Kennedy (2010) stress the importance of information when it is collected and utilized for prospective decision making rather than confirming already made decisions. A practical way is gathering the collected knowledge in the organization, and then tying it to the previous research and presenting this in the context of a risk assessment strategy. Since risk can be used as a metric, crime prevention policy makers can conduct calculations based on risk and evaluate their efforts to design future responses. It was expected that the findings of this study would provide actionable information as to what constitutes the risk for burglary among different neighborhoods. Since the process of risk assessment relies on involvement of other parties, making burglary related risk factors information available to the public was alone considered an important contribution.

Burglary can be regarded as a common problem in urban neighborhoods worldwide. It affects the victims both financially and emotionally. Society would gain a lot by reducing the number of burglaries. Prevention relies on prediction. Criminological theory and the related literature have identified numerous predictors or correlates of residential burglary. The social disorganization approach points to the social control and social life in the neighborhood and identifies residential stability and collective efficacy as the key factors in explaining the neighborhood's crime rate. Environmental criminology approach directs our attention from the reason of criminality to the commission of a crime event, and focuses on the opportunities that places create for a crime to occur. By incorporating ideas and constructs from both approaches, this study

proposed a research agenda to better understand the effects of the social context on residential burglary phenomenon in the urban neighborhoods of Bursa, Turkey.

To this end, it followed the innovative ideas of the Risk Terrain Modeling approach which treats "opportunity for crime" as "place based risk". The risk assessment model was created to predict high and low risk neighborhoods, hot spot analysis were then conducted, and the forecasts were then compared to the actual crime distribution. Further, risk clustered neighborhoods were studied to better understand the social context and how this contributed to burglary events.

Dissertation Outline

The following chapter provides an overview of the theoretical framework and discusses the social disorganization and routine activity theories with regards to their importance in explaining neighborhood crime and residential burglary. It also reviews the literature by disentangling the burglary event and by discussing the burglars' assessment of risk factors, while also providing the literature that explains neighborhood crimes as a result of the lack of social control associated with the ecological context. In applying the risk terrain approach, the selection of risk factors is an important step. The theoretical framework of this study identified the neighborhood level correlates of burglary. Chapter 2 discusses these social and environmental variables which were used as risk factors in the RTM model. Chapter 3 introduces the study area, and explains the data, variables, the RTM steps, the selection of burglary risk factors, the methodology and the analysis approach. Chapter 4 presents the bivariate and multivariate analysis, RTM and Hot Spot Mapping comparisons, the OLS regression results, and the resulting risk terrain maps for

neighborhood types. Chapter 5 presents the discussion enriched by the field observations for each neighborhood type, and Chapter 6 provides policy and research implications.

CHAPTER 2: THEORETICAL FRAMEWORK AND LITERATURE REVIEW

It is proposed that both the social and the environmental context affect residential burglary rates. The criminological theory and research address the link between burglary and its context. This chapter discusses the relevant theoretical frameworks in this field, and summarizes the burglary research by providing its major correlates that stem from the theory.

Social Disorganization Theory

Studies on burglary and its social, environmental contexts has largely emerged from the earlier works of the Chicago School. Benefiting from the well-established sociology school in the University of Chicago, and the earlier influential work of Robert Park and Ernest Burgess, the criminologists in Chicago formulated an ecological approach to crime. The first scholars who followed Park and Burgess's concentric zone scheme were Clifford Shaw and Henry McKay (1942), who explained crime and delinquency within the frame of the changing urban environment. They viewed crime as a product of decaying transitional neighborhoods, social disorganization and conflicting values, and social systems.

Since its initial formulation by Shaw and McKay, social disorganization has become one of the most important theories for explaining neighborhood crime and delinquency. Social disorganization is generally defined as "the inability of a neighborhood to achieve the common goals of its residents and maintain effective social controls" (Sampson & Groves, 1989, p. 777). It refers to the societal environment to explain criminal behavior and crime rates in a community. Rather than the individual predispositions, the nature, environment, characteristics, or the context of neighborhoods

leads to or regulates the crime rates. Thus, crimes do not occur independently of the social contexts where they occur.

The most significant finding of their study reiterated the importance of the impact of social and physical environments on crime rates. They showed that the neighborhood delinquency rates remained constant as the nationality structure of the population changed. The migration, changing demographics of the city, and the population shifts that occurred among the zones did not change the crime rates in particular areas. In a crime prone neighborhood, it was as if the inherited disorganization overcame the cultural norms and values of the new incoming groups. That is, when delinquency rates remain stable regardless of the ethnic makeup of the population, then crime rates should correlate to the environment where the crimes occur.

Influenced by these propositions scholars focused on the macro level correlates of neighborhood crime to elaborate the mechanisms through which neighborhood social context affects delinquency (Bursik & Grasmick, 1993; Kornhauser, 1978; Sampson & Groves, 1989). Aggregate levels of crime rates were explained by the associations of the characteristics of social units, such as neighborhoods or cities (Smith & Jarjoura, 1989). Community characteristics, in particular racial heterogeneity, lower income, and high levels of residential instability correlated with higher levels of burglary rates.

Routine Activities Theory

Another influential line of thought addressed the role of opportunity for neighborhood crime, particularly burglary. Rather than the distant factors that generate a preoccupation for criminal inclinations, the “new crime theorizing” approach places the emphasis on how settings themselves create opportunities for crime. The idea behind this

is that, whatever the root causes that lead a person to offending, certain elements are still "necessary" for a crime to occur. As Felson and Clarke (1998) claimed, since no theory could find a necessary condition for a person to commit crime, opportunity should be viewed as a root cause since it is the *sine qua non* for the crime occurrence.

According to this theoretical approach, three elements have to converge in time and space for a crime to occur: Motivated offenders must come in contact with suitable targets in the absence of capable guardians (Felson, 1998). The supply of suitable targets and the presence of capable guardians are a function of our everyday behavior or "routine activities" (our family, work, leisure, consumption and other activities). The routine activities approach (originally) takes the supply of motivated offenders as given and focuses on the other elements of crime. In order for a crime to occur, a motivated offender must find a suitable target in the absence of a capable guardian.

In explaining criminal events, the routine activities theory assumes that human behaviors are products of rational choice. Thus, criminal behavior can be predicted based on an analysis of the costs and the benefits involved in the commission of a crime. The costs and benefits involved in crime vary depending on the situations and targets. For example, while targets in close proximity to motivated offenders' houses are convenient (benefits), the likelihood of being detected (costs) becomes high. Targets with high monetary values (benefits) are also likely to have strong guardianship (costs).

The rational choice perspective argues that "crime is broadly the result of rational choices based on analyses of anticipated costs and benefits" (Cornish & Clarke, 1986). Offending is purposive, and offenders (although limited) make calculations of benefits,

gains, and risks. The offender's calculations do not take into account the remote gains and pains. They think about the immediate ones available. In order to understand what choices offenders make, it is important to study very specific types of crime. If crime is a factor of opportunity, then situations that offer specific opportunities for specific crimes may provide a good starting point for understanding and preventing crime.

Clearly, the social disorganization theory complements the opportunity theories by highlighting the neighborhood social context that eventually affects the burglary victimization. Investigating burglary from these theoretical approaches can also be challenging. Most often, social disorganization constructs are operationalized at the neighborhood level, and opportunity constructs at the individual or household level. These macro level and individual level explanations of burglary may overlap. They can detect the same risk factor, but explain it in different terms.

For instance, the percentage of single adults in a neighborhood may correlate with high levels of burglary. It is not safe to conclude from this finding that the social makeup of neighborhood explains the burglary victimization because it is probably the lifestyle of single adults that make their homes unguarded, which eventually attracts burglars and produces higher numbers of burglary. In this example, the characteristic of a social unit (percent of households with single adults) seems to be correlated with burglary, however, an individual level measure; i.e. guardianship of houses may be more satisfactory explanatory factor.

Smith and Jarjoura (1989), (referring to Garofalo) used the example to remind us that if the single adult households are disproportionately distributed to neighborhoods that are more transient, the question is whether the higher probability of victimization

among those can be explained by characteristics of neighborhoods in which they are disproportionately located. To resolve this dilemma, multilevel studies on burglary victimizations were conducted, but the authors did not go any further than claiming that both micro and macro level factors predict the risk of burglary victimization.

Major Correlates of Residential Burglary

Target Attractiveness: Environmental Cues

The opportunity theories view burglary from the point of view of the target attractiveness, guardianship, and the target exposure constructs (Tseloni, Wittebrood, Farrell & Pease, 2004). The problem of burglary is often studied as a problem of victimization, and most often from the burglars' point of view. The burglary rate indeed cannot be thought to be independent of burglar decision making, however. After all, a single burglary is the result of a series of actions and offenses. The rate of burglary in a neighborhood is a product of the burglar's *modus operandi*. It is therefore important to look at burglaries from the burglars' risk assessment perspective, and link the opportunity theorizing constructs to burglary.

Although the supply of suitable targets for residential burglary seems vast, in reality, targets are limited (Wright & Decker, 1994). A burglar would look for a target that should "be unoccupied, not be easily observed from the street of neighboring homes, a proximate location to his/her living location, be easily accessible, and finally should contain items that worth stealing" (Cromwell & Olson, 2004, p. 18).

According to environmental criminologists (Brantingham & Brantingham, 1981; Brantingham & Brantingham, 1998) the decision making process of burglars is largely related to the environmental cues or complexes of cues. That is, the environment's

characteristics such as spatial, temporal, and socio-cultural factors can provide signals that affect a burglars' target selection decision-making processes. The past experiences of offenders and their association with environmental factors then creates a template for the burglar. This process is developed based on the intuitive mental determination of the offender.

In understanding how offenders select their targets, two studies have referred to the environmental cues. Maguire and Bennett (1982) interviewed 40 persistent burglars to identify the environmental cues that burglars think of while selecting their targets. Bennett and Wright (1984) identified similar cues: occupancy, surveillability, accessibility, and security.

The attractiveness of the target and the risk of detection are two key criteria when choosing the target area. For instance, when all other things are equal, affluent neighborhoods are preferred over poor ones (Bernasco & Nieuwbeerta, 2005). Similarly, single-family houses are more attractive than flats in terms of risk of detection.

The literature also proposes a relationship between drug related areas and neighborhood crimes (Brown & Bentley, 1998). A "drug related area" referred to an "area of high concentration for drug arrests, high drug use and drug dealing and will be at a greater risk for larceny theft incidents" (Sutton, 2010). "Areas with a high concentration of drug arrests, high drug use and drug dealing may also be titled as "drug related areas". These areas usually pose a high percentage of risk for violent incidents such as aggravated assault, which is well discussed in the literature (,Parker & Auerhahn, 1998; Weisburd & Green, 1994, 1995).

Rengert and Wasilchick (2000) interviewed burglars to examine whether drug dealing locations have any attractiveness to predatory offenders. Because predatory offenders might commit crimes surrounding drug dealing locations, numbers of crime calls have been found to be higher in the areas identified as drug markets. Yet, they found partial evidence for their hypothesis, and were also able to draw attention to the possibility that whole place may foster deviance in a particular block, facilities in the block may draw people with mixed motives into the area or a combination of both may arise.

Therefore, a density map was created in this present study by using the measure of two standard deviations more than the mean density value from the points of drug arrest areas to constitute the last of the three risk map layers.

In addition, Darcan (2012) investigated the effects of Closed Circuit TeleVision (CCTV) camera views on certain crime types in Bursa, the study area of this research. He found drug related areas to be correlated with the locations of larceny, aggravated assault and theft from autos.

Transient populations in a neighborhood may also be a risk factor for burglaries. For example, as found by Smith, Frazee and Davidson (2000), there was a significant relationship between robbery cases and hotel/motels. Rice and Smith (2002) also suggested that thefts were highly associated with the number of hotels/motels in a neighborhood location. Moreover, Wilcox, Quisenberry, Cabrera, and Jones (2004) found substantive effects of business locations, schools and playground as locations utilized by transient populations on burglary rates.

Lind and Lind (1986) found a statistically significant relationship between crime rates and tourism in resort destination areas. Conducting their research in Honolulu, Hawaii, they revealed that tourists in the resort destination areas experienced higher rates of larceny, robbery and rape than residents due to their increased vulnerability characteristics and engagement in some activities that facilitate victimization. Locations that involve higher risk-taking behavior when compared to normal locations such as night clubs and bars at late hours, travelling to unfamiliar and remote places also facilitates victimization.

Duru (2010) summarized the findings in the research literature on the interaction between the places of transient populations and social disorganization/crime, and listed a couple of effective factors such as private high schools, taverns, lounges, busy places, restaurants, gas stations, cheque-cashing stores, pawnshops, halfway houses, subway stations.

Time

Another risk factor for residential burglary can be time. Coupe and Blake (2006) found that burglary opportunities vary across daylight and nighttime where more expensive and less guarded properties are targeted in the daytime, better-guarded properties are targeted at night. Local level correlates can be more explanatory. For instance, in warm climates, the lack of air conditioning may facilitate open window break-ins at night. Interviews with active burglars also suggested that they account for the time use and daily activities of people in neighborhoods.

For example, school pickups may leave the premises unguarded for certain amount of time for every weekday. Similarly, local leisure activities, sporting events, etc.,

may create better opportunities during weekends. Weisel (2002) suggested that in the US, percent of daytime burglaries have risen in the last decades, and this is generally attributed to more women working outside of homes. It should also be noted that the exact time of burglary may not be determined in most cases. Most of the temporal data are therefore available as time frames, typically dividing a 24 hour period into 4 categories.

Time of day, for example, can determine the method of entries. Burglars operating at night would avoid methods that would involve breaking doors, door locks, or windows. They may prefer, in summer, open window entries. Time, in this example can determine the target location, because when a burglar chooses an open window entry, a vast number of available targets drops significantly. The burglar then eliminates higher buildings, or at least upper floors in tall buildings; the visible first floors; and the areas where it will be hard to find open windows on a summer night (that is, neighborhoods that host households with air conditioning systems).

Having said that, the time of the actual break-in is another major concern when a burglary is considered. The majority of the break-ins happen when houses are not occupied, so the time of burglary on the police report does not always fully reflect the actual time of the offence. However, studies using time as an independent variable showed that knowing the time of a burglary could still be valuable if carefully analyzed. For instance, Coupe and Blake (2006) claimed that “daylight and darkness offending could be established with certainty for 86 percent of their sample”. In their sample, “73 percent of burglaries took place when properties were unoccupied and their precise times were often unknown, and over half of burglaries had an uncertainty in their time window

of less than 4 hours, with a mean of 5 hours, whereas the average burglary went unnoticed for approximately 2.5 hours".

Transportation and Offender Proximity

The literature suggests that even though the professional burglar uses many forms of transportation and often operates in remote neighborhoods (Brantingham & Brantingham, 1984), burglars typically select their neighborhoods and targets among the ones they are familiar with (Shover, 1996). As stated earlier, burglars usually do not take long-term risks into consideration in the equation of decision-making. Physical and social aspects of surveillance and control help burglars to calculate the risk of detection. Architectural features, visibility of the buildings, lighting, and the ease of entry are among the cues that burglars consider (Bernasco, 2006).

This assessment will be much easier if the burglar has a better knowledge of the neighborhood. Thus, the neighborhoods closer to active offenders may be at a higher risk than those that are further away. Indeed, the literature shows that proximity to active offenders is a risk factor for burglary (Bernasco & Luykx, 2003). While studying the effects of racial composition on criminal victimization, Cohen , Kluegel and Kenneth (1981) found that rather than race, the neighborhood's proximity to potential offenders is associated with burglary victimization.

Bernasco (2006) compared solitary burglars and co-offending burglar groups regarding their selection of target area. Using residential burglary data from the city of the Hague in the Netherlands, he found that physical accessibility was a key element in target selections.

Newton, Johnson, and Bowers (2004) evaluated an intensive policing operation on a single bus route that quantitatively supported findings with regard to higher levels of arrest rates (4 times compared to the others) for assault and thefts from vehicles on the bus route and up to 400 meters in the surrounding area. These findings, although related to crime prevention tactics, can serve as an example of crime concentration in bus routes and their related areas that have a higher number of community members as well as bus routes as the facilitators of crime in specific places.

The availability and prevalence of public transportation in remote parts of the city make the city easily accessible to anybody. Inexperienced, unprofessional offenders may find it hard to venture through different parts of the city unless there is an available means of inexpensive transport. In addition, "high-crime places within a hot spot area of crime at taverns or liquor stores are often in nightlife areas serving as playgrounds for the city's young adults or for a specific ethnic group. Often located in an affluent singles area close to public transportation, these areas have many high crime establishments in close proximity, creating a potentiation effect, and attract patrons from around the city" (Block, and Block, 1995, p. 173). Bus stops and subway stations are among those suitable access points for offenders who need to reach the crime area.

Collective Efficacy: Residential Instability and Poverty

There is an overwhelming amount of literature on the degree of a neighborhoods' social cohesion and crime rates. In general, socially disorganized neighborhoods that lack collective efficacy (Sampson, Raudenbush, & Earls, 1997) cannot assert social control over their residents.

Residential mobility and poverty are associated with collective efficacy. Weakened ties and low levels of social cohesion reduce control in a neighborhood and diminish its territoriality. Residents do not "look after" an resident's property; they may even not know who their neighbors are. This is an ideal safe haven for a typical burglar. Burglars will minimize the risk when they go unnoticed in a neighborhood. The lack of social cohesion and control will create an environment where neighbors are not alarmed by other peoples' presence and do not intervene in their activities.

The National Crime Victimization Survey (NCVS) estimates the risk of burglary is higher in lower income households. Home ownership also has a negative impact on burglary risk. The risk is also higher in rental properties (Catalano, 2010). Overall, the social and economic makeup of the neighborhoods created mechanisms, which led to an increased risk for residential burglary.

Local Risk Factors: Coffee Shops and Internet Cafes

Local social life may also provide locality-specific risk factors for certain types of criminal activity. For instance, Haci Duru (2010) studied crime rates on Turkish street blocks in his dissertation, and tested Turkish coffee houses as a crime correlate in certain street blocks. Coffee houses are not coffee shops, or cafes; these are historical coffee shops (since the Ottoman Empire) where only men attend. Today, they have evolved into places where still predominately men attend, spend several hours among their friends and play cards. It is not rare that gambling takes place in these premises.

Duru (2010) found a significant positive correlation between the number of coffeehouses on a street block and the number of burglaries on that street block. Although it is not explained, the answer as to why coffee houses correlate with burglary

can be explored in the offenders' access to more available means. By attending a coffeehouse in a specific neighborhood, potential offenders may acquire neighborhood specific information in addition to their personal observations. In the search for available houses to break in, this information would come in handy.

In addition to that, potential burglars may turn into active burglars by getting in touch with active or former burglars. Internet cafes are similar to coffee houses in this regard. They are places where the primary activity is playing computer games. The clientele are relatively young. Although internet use is available, most of the "customers" prefer to play games. Compared to coffee houses, one can safely state that the age difference between the client groups is not small. Nevertheless, the concentration of both coffee houses and internet cafes in a neighborhood pose a similar risk. Thus, both may be treated as risk factors for residential burglaries among Bursa neighborhoods.

Research Questions

There were three research questions.

Research Question 1: Do social disorganization related neighborhood characteristics (risk factors) correlate with residential burglary?

Research Question 2: As a methodological approach, is using environmental factors and social factors incorporated in a risk terrain model more predictive of future crimes than those made through present crime hot spots?

In other words, do the hot spot analysis and the Risk Terrain Modeling approach predict high and low risk neighborhoods for burglary? Which model predicts the residential burglary distribution over neighborhoods more accurately?

Research Question 3: Do types of neighborhood affect neighborhood level risk for residential burglary? How do the varying social environmental contexts in the neighborhoods contribute to the production of burglary risk?

Hypotheses

The hypotheses derived from the research questions are as follows;

Hypothesis 1: Social disorganization increases likelihood of burglary in a neighborhood.

Hypothesis 2: RTM predicts the occurrence of future residential burglary better than hot spot analysis.

Hypothesis 3: Neighborhood type affects the likelihood of burglary in a neighborhood.

- Single family housing in a neighborhood decreases the likelihood of burglary. All other neighborhood types increase the likelihood of burglary when compared to single-family housing.

Summary

To better understand the topic of residential burglary, two influential lines of thoughts have to be considered. Drawing on the Chicago school's approach to viewing crime as a product of decaying transitional neighborhood, and lack of social cohesion and organization, the social disorganization construct refers to the role of the societal environment in explaining criminal behavior and crime rates in a community. Defined as the willingness of individuals in a neighborhood to work together toward a common goal, collective efficacy has been shown to be a cause of crimes across neighborhoods.

The routine activities and rational choice approaches emphasize the fundamental need for crime occurrence as the “opportunity”. Even if the contextual conditions are ripe for a burglary to occur, a motivated offender still needs to meet a suitable target where there is not sufficient guardianship. Although it is the burglar who picks the target to attack, the decision making of a burglar is not independent of the neighborhood context.

The literature shows that the burglar’s target selection starts with the selection of the area, and considers two major concepts; the risk of apprehension and the availability and the quality of the target. Lower levels of collective efficacy also make a neighborhood vulnerable to the burglary. Local factors can also correlate with the burglary. For instance, the prevalence of coffee houses in a neighborhood may increase the rate of burglaries.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

This was a cross-sectional exploratory study, which examined the social context of residential burglary by exploring neighborhood level risk factors in the city of Bursa, Turkey. For this purpose, quantitative and qualitative methods were used. Before I started to analyze the quantitative data, I was involved in various police ride along for one week in Bursa to observe and classify the neighborhood types. The quantitative analyses included the use of correlation and regression analyses of police recorded burglary data and digitized maps generated through GIS. Qualitative data were collected in order to explain risk factors at the neighborhood level. Systematic observations were carried out for a two-week period on different neighborhoods after the analyses of quantitative data.

This chapter introduces the study area, presents the study design and describes the analytical strategy of this research, plus the data and variables.

The Study Area: Bursa

Bursa, known as Prusa historically, has hosted various civilizations, such as the Mysian, Hellenistic, Roman, Byzantine, and Ottoman civilizations, since its evolution in 202 BC. In 1326, it became the first capital city of the Ottoman empire. Because of its strategic location on the west part of the Anatolia, and being an important station on the Silk Road line, Bursa has long been an important center for the silk trade. Its historical and cultural richness shaped today's Bursa as a living paradise of history with its various museums, mosques, churches, and historical areas.

With a population of over 2,500,000, Bursa has been growing day by day as it continuously receives large migrant populations. In the past, and mostly during World

War I, many Balkanian Turks moved to Bursa because of their uncomfortable life conditions in the Balkans. In 1990's, Bulgarian Turks had to move to Turkey because of the political conflict and unrest in the country. A large part of those persons settled in Bursa.

In addition, Bursa also received migrants from the eastern part of Turkey. A significant migration movement has started in 1960's and continued through 1990's, and Bursa became the fifth largest city in the country with a 41 % migration rate between 1980 and 1985. The migration rate increased to 62% between 1985 and 1990 (Atac, 2008). This period was recorded as representing the highest migration rate of Bursa throughout the history. The reason for this was the migration movement of Bulgarian Turks to Bursa. After 1995, the migration rate dramatically decreased since the city's population reached that of a metropolitan standard.

Today's Bursa has a cosmopolitan population made up of people from different regions and ethnic groups. Each ethnic group generally has their own living areas. This situation seems quite similar to what Wirth (1928) argues about in his urbanization perspective. He coined three factors that characterize cities: size, heterogeneity, and density. According to Wirth, to keep their culture alive and to protect themselves from dense and large populations of the city, migrant populations coming from the same parts of the country gather in isolated neighborhoods. The case in Bursa is also relevant. For instance, people coming from Artvin city, located in the north eastern part of Turkey on the border of Georgia, mostly live in the same neighborhoods. People who have immigrated from Ağrı, an eastern city, mostly live in the same area. Also, there are

different regions where foreign immigrants, most of whom are from Bulgaria have gathered.

The reason for the high rate of migration is due to the industrial development of the city. Bursa is known as the center of the automotive industry and textile trade in Turkey. Most automotive factories that are located in Bursa provide employment opportunities. Besides, the textile industry employs a large number of people in the region. According to the TUIK (2009) statistics, Bursa has the fifth largest growing economy in Turkey.

The sharp increase in population due to migration in Bursa has led to significant urbanization problems in the city. Especially, unplanned and illegal structures have left urban sprawl in some regions. Currently, we can classify the urbanization profile, or the type of residencies of Bursa in four different categories as *multi-family apartment complexes, adjacent-type middle class structures, single family housing* and *shanty structures.*

Public housing is a new style of residency in Turkey where lots of high rise apartment blocks are built in large areas. These areas include recreation centers, schools, hospitals, and shopping centers. The government undertook the construction of public housing by establishing the Turkish Public Housing Authority (Turkish acronym, TOKI). The public housing system is an easy way to own an apartment because the government offers affordable ways to pay for this in a long period. The mission statement is "to own a house by paying rent". Therefore, people with mid and lower income have the opportunity to own apartments within the public housing system. Large scale urban

transformation projects from shanties to multi-family apartment complexes have been conducted in some parts of the city.

The number of families living in a public housing community may differ from between 150 to over 2000 households. The buildings in a public housing community are tall with many floors. In one floor, there may be 2 to 4 different separate apartments. Most of the buildings have standard types of entrance, doors, pavements, etc. In most cases, each building block has a building keeper who is responsible for cleaning the corporate living areas, collecting trash from the residences, and taking care of utility problems. The community management requires residents pay a certain amount of money for the utilities and expenses of the community workers.

An adjacent-type structure is another type of residency in Bursa. In this kind of residency, lots of apartment blocks stand adjacent and each of the apartment blocks has its own style and structure. This is the most common type of classical residency in Bursa, as well as in Turkey, for people with mid-level income. The number of floors generally ranges from 2 to 7 but it might differ based on the area. The Bursa Municipality plans and gives permission to build residences considering ground and environmental survey. Adjacent-type buildings are subject to permission from the Bursa Municipality and the owner of the construction has to meet some requirements. However, prior authorities probably did not fully enforce those requirements for the builders and many violations brought major problems in these types of communities. For instance, the majority of these buildings do not have a parking garage. Therefore, people park their cars on the streets. In most adjacent type neighborhoods, finding a parking spot can be challenging.

Most of these apartment buildings have two or three bedrooms and a balcony. Ground floors are usually built for businesses such as shopping centers, small grocery stores, barber shops, pharmacies, etc. There is no security for the entrance of the building. However, the outside door is closed, and most residents use an automatic door system. Most apartments keep their outside doors closed. The neighbor relations in this type of community is closer than villa and public housing communities, so most people in certain areas know each other and have close relationships.

Another type of residency in the region is the single family residence. Traditional single family housing is preferred by the locals. As the city grew, these former villages became parts of the city. Some areas resisted urban transformation. Villa type residences are another form of single family housing. Villas are self-contained and isolated houses where people with high level income live. These kinds of residencies are located in very small areas of Bursa. We can further classify villa residencies in two types. One is a large villa community where many similar villas are constructed and these have a central management system that runs the utilities. This type of living community is surrounded by a fence and a security guard who controls the front gate and entrance. The other type of villa residency does not have a specific structure. The type of residency differs based on the desire of the owner. Mostly, they have a garage, patio and a garden, and a surrounding fence. The building might be single floor, duplex or triplex. Typically, they do not have a security person at the entrance, but in most cases they do have an electronic alarm system.

The last type of residency is the shanty houses. The shanty houses are irregular dwellings, which were built illegally in the ghetto areas of Bursa. The government did not

take notice of these kinds of illegal structures in the past, and large living communities took place in some areas of Bursa. Most immigrants with lower level income preferred to build a shanty house in a location where he or she could find space. Some of these illegal structures were built on public lands, while others were constructed on individually owned properties.

The shanty houses are mostly detached and do not have fences surrounding them. Most shanty dwellings are in poor condition because of the owners' financial problems. Due to the illegal formation of the area, the infrastructure of these areas is poor. People living in certain area also know each other and have close relationship. Many people and police believe that some of the ghetto areas in Bursa create potential threats for public security.

The metropolitan area of Bursa is divided into three major districts, which are Nilüfer, Osmangazi, and Yıldırım. In total, there are 17 rural districts inside the borders of Bursa. However, our research case includes only the metropolitan area of Bursa in three central districts. TUIK's (2009) statistics show that 65 percent of the total population lives in the metropolitan area of Bursa.

In general, 45 percent of the population are employed in industrial areas such as industrial factories, car production factories, and other industrial areas. In addition, 45 percent of people in Bursa work in service-oriented sectors in public and private areas. A further 5 percent of the population deals with agriculture, and 5 percent are employed in the construction area (TUIK, 2009).

Geographically, Osmangazi is located in the center of Bursa, while Nilufer lies in the west and Yıldırım lies in the east part of Bursa. The acreage of Osmangazi is 399

square kilometres, Yildirim's acreage is 397 square kilometres, and Nilufer's acreage is 378 square kilometers. Among these three regions, Osmangazi plays a central role since most business centers, governmental buildings, and entertainment areas are located in this area.

Burglary Data and Digitized City Map

Obtaining data for social research is a tough task in Turkey. For this dissertation, the only available data were those available from police records and obtained from the Bursa Police department, which is one of the leading organizations as far as technology use and data gathering are concerned. They are the pioneers in the country when it comes to the use of computer statistics. The police data on burglary incidents was obtained by official permission. These data do not include any private or personal information about either victims or offenders. The incidents cannot be matched with any person. Bursa gendarmerie also keep crime records, however, the study area covers 165 neighborhoods of metropolitan districts in Bursa, all of which are in the police jurisdiction. Information related to the gendarmerie jurisdiction was not examined or included in the scope of this study.

For a typical burglary record, the response procedure often occurs as follows: when the burglary takes place and the victim realizes this, she/he calls the police, and the police in police centers acknowledge the complaint. Simultaneously, the crime scene is investigated. In the police centers, officers fill out a crime report which they have to do via a closed-circuit computer network. For all crime types, forms have been automatically created by Bursa Police Department. So, every police officer in every police center fills out a unified report form. If any officer misses an information field (for instance, the

building number, or method of entry), the system will not allow the officer to save the record. Thus, for burglaries, wherever they happens in Bursa, the variables reported are all similar.

The crime data examined in this study include burglary related variables from 3 metropolitan districts of Bursa: Osmangazi, Nilufer, and Yildirim.

Census data were obtained from TUIK, (Turkish Statistics Institute) in the form of two different Microsoft Excel files. The first file included the city level population and demographic variables, for the years 2000 and 2007.

Table 3. 1 Population of Bursa (metropolitan districts) (TUIK (Census), 2007))

#	District	Population
1	Osmangazi	650.647
2	Yildirim	573.65
3	Nilufer	198.62
	TOTAL	**1.422.917**

In Turkey, Census data are not collected frequently. The 2007 Census do not include socioeconomic variables such as educational attainment and employment status. Thus, the only available and reliable demographic data concerning the needed variables on the target area of the study came from the Census 2000 data. Similar studies with gaps between the merger data in the U.S. also suggest using crime and organizational level data merged with data from the nearest Census available (Demir, 2009: Sozer, 2008).

Crime data obtained from the Bursa Police Department included residential burglary incidents occurring in three metropolitan districts of Bursa over the years 2007-2009. There are 165 neighborhoods in the metropolitan boundaries of the city of Bursa.

They vary significantly by area size and population. Neighborhood level variables were obtained from TUIK.

A digital map of Bursa was also received from the police department. This included 165 neighborhoods, and the crime data included the X, Y coordinates of all the reported burglaries within these neighborhoods. The map also included the locations of some infrastructure level variables, such as bus stations, hotels, light rail stations, banks and Automated Teller Machines (ATM), bakeries, parks and playgrounds, schools, coffee houses, jewelry stores, pharmacies, medical centers, cemeteries, sports complexes, mosques.

The three-year crime data were divided into two 18-month periods. Period 1 ranged from January 01, 2007 to June 30, 2008; and period 2 started on July 1, 2008 and ended on December 31, 2009.

The number and distribution of burglaries are presented in Table 3.2, and these data summarize the descriptive statistics related to those residential burglaries in Bursa that occurred over the study period. Between January 01, 2007 and June 30, 2008 (period 1), a total of 3534 residential burglaries occurred in 165 neighborhoods. Hudavendigar had the highest number of burglaries with 159, whereas some neighborhoods had no burglary incidents. The mean was 21.4 burglaries per neighborhood and 20% of the burglaries occurred in 7 neighborhoods; Hudavendigar, Arabayatagi, Ihsaniye, Konak, Kukurtlu, Besevler, and Cekirge.

Table 3.2 Descriptive Statistics of Burglaries within Bursa neighborhoods (N= 165)

Periods	Min	Max	Mean	St.Dev.	No of Burglaries
Period 1	0	159	21.4	23.75	3534
Period 2	0	131	20.15	24.18	3164

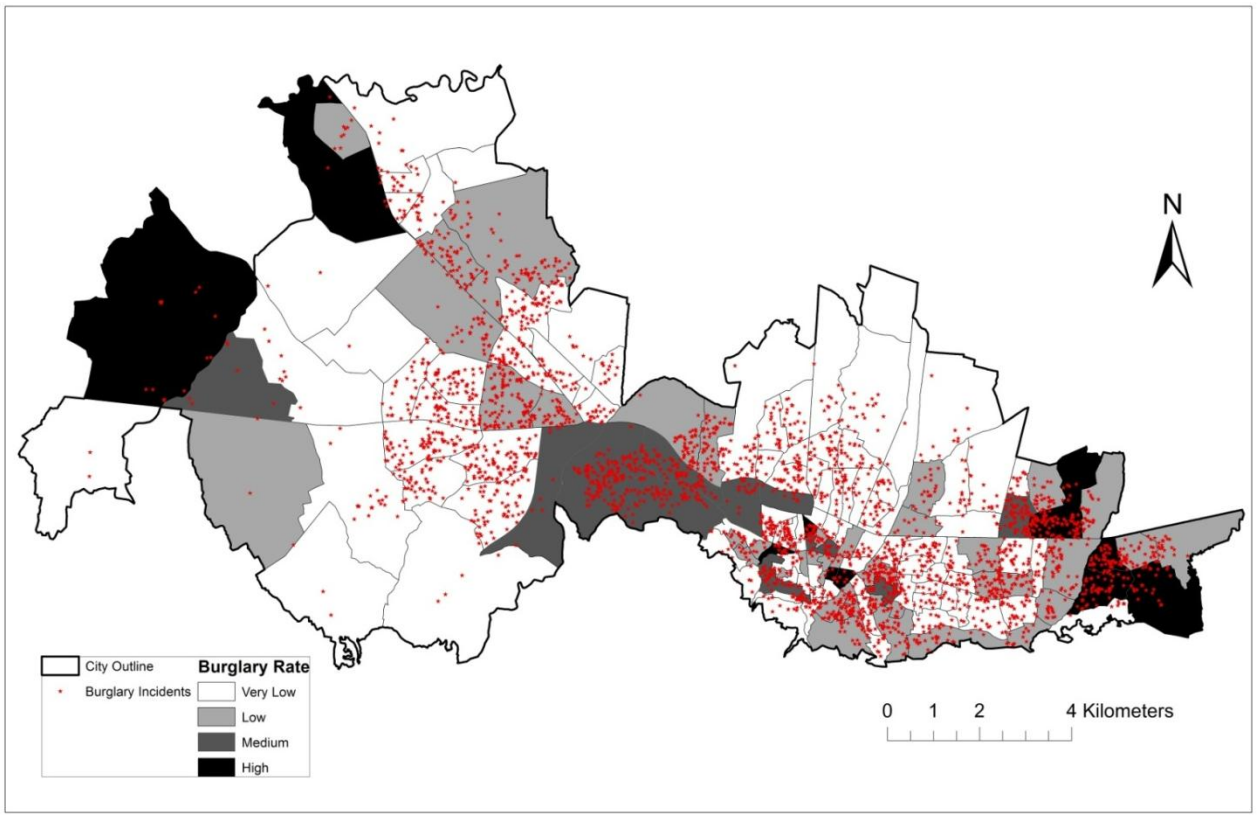
Burglary incidents and their clustering in certain locations can be misleading in understanding the phenomenon. Since this study investigated the risk of burglaries in different social settings, it is important to view the problem at hand accurately. There was significant variance in population sizes and density among Bursa neighborhoods studied. Therefore, consistent with the literature, this dissertation refers to the rate of burglaries while discussing the seriousness of these.

The burglary rate was calculated according to the available targets. In this dissertation, a neighborhood's rate of burglary victimization was computed as the number of burglaries in that neighborhood, divided by the number of households. Since this number was fairly small, it was then multiplied by 1000 to create a rate of burglary variable.

The map below shows the burglary incident locations and the burglary rates in the neighborhoods. It should be noted that the actual concentration areas of incidents are closer to the city center where the population and the number of households are high. When the number of households for every neighborhood is taken into account and the burglary rate is computed, the map then shows a meaningful difference in the concentration of burglary rates.

In a high rate burglary neighborhood, can it be claimed however, that the risk of victimization is also high? Since the rate was computed only with "the number of households" variable, should there be other factors to consider when discussing risk? The analytical framework of this research started from this question and identified several possible factors in determining the risk of residential burglary victimization.

Map 1 Residential Burglary Locations and the Rate of Burglary by Neighborhoods (Rate = No. of incidents / no. of households)



Unit of Analysis

The unit of analysis of this study was the neighborhood. These were the smallest administrative units in the Turkish public administration and governance structure. There are no defined rules on designating the geographical or population size of neighborhoods. Neighborhood populations range from 305 to 32005, while the area size ranges from .025 to 11,04 square kilometers. It is not rare that the names and boundaries of districts and neighborhoods are changed. The census data on neighborhood characteristics were collected in 2000, thus, the 2000 layout of neighborhoods was used. In this study, the effects of social context on burglary event were explored by identifying neighborhood level risk factors. In answering the second research question, Risk Terrain Modeling

(RTM) and Hot Spot Analysis were conducted. Since GIS software allows us to treat smaller areas as crime place , to be able to benefit from this advantage and to compare the predictive ability of RTM and hot spot mapping, 140 meter square cells were created. Caution is recommended here however, because these cells are not the unit of analysis, and in answering the final research question, the risk values of each cell was thus summed again at the neighborhood level.

Analytical Framework

This study was driven by three questions, all of which were answered using separate analyses. To describe the risk factors at the neighborhood level, bivariate correlations and regression analyses were conducted. To measure the predictive power of RTM over hot spots, both analyses were conducted, and compared using binary logistic regression. Finally, neighborhoods' risk values and burglary rates were regressed on neighborhood type using OLS regression. The categorized neighborhoods were investigated concerning their contexts and how burglary risk was produced.

Multivariate Analyses

Negative binomial regression was also used to analyze the relationship between residential burglary and neighborhood characteristics that were potential risk factors. The majority of studies that analyze crime rates as the dependent variable employ OLS regression. However, Osgood (2000) showed that poisson-based regression models are more appropriate than OLS in analyzing aggregate offense rates, where population size of aggregate units are small relative to offense rates, which is also the case in our data. Populations of the neighborhoods in our data are highly variable, and neighborhoods with smaller population tended to have higher burglary rates even if the corresponding number

of burglaries was very small. Therefore, a Negative bionomial regression, a variant of the poisson regression approach was used in the analyses. The likelihood-ratio test that $\alpha = 0$ being statistically significant at the .01 level tells us that there was over dispersion in the data and that a negative binomial regression should have been used instead of a poisson regression.

RTM Analysis

Since RTM is a critical analytical tool for this current study, and since it is still a recent model, this section starts with the explanation of the RTM steps, and relates it to the analytical approach of this study.

The RTM approach allow us to include a different set of environmental variables that are expected to have more explanatory power for burglary event. Thirdly, the selection of "contexts" for the final analysis can be implemented using different criteria. Traditional hot spot analyses procedures use prior crime concentration to predict future crime locations and direct the resources accordingly. It was believed that if RTM predicted the future crime rate more ably than hot spot data, this could facilitate researchers with another valid perspective with which to investigate certain social issues. Once proven to be a successful diagnostic tool for environmental research, it may thus provide crime researchers an alternative and practical approach. In this regard, it should be noted that Darcan (2012) conducted an RTM analysis to explore the effectiveness of police monitored CCTV cameras on street level crime in Bursa, and found it to be a valuable analytic tool. The fourth factor that adds value to this research question is that, this would be the first study which would compare the predictive power of RTM and traditional hot spot mapping in this study's social environmental context of Bursa.

The RTM approach is a crime forecasting approach that standardizes preexisting underlying criminogenic factors into a single "risk layer" to predict the future events (Caplan, Kennedy, & Miller, 2010). Operationally, each separate feature is connected to a common geography in the form of a density raster map comprised of equally sized cells. Within each layer, cells are re-classified and coded with a "risk" value based on their density values. These "risk" values range from 0 (density value below the mean) to 3 (density value +2 SD). Finally, the separate layers are combined within a single "risk" layer via the ArcGIS raster calculator tool, which sums the risk values of cells in the different layers (Caplan & Kennedy 2010: pp. 29-33).

Place based risk of every factor creates a separate layer in RTM. For instance, coffee houses (not cafe's) can be considered as a risk factor. For the distribution of coffee houses, each cell in the raster grid received a score between 0 and 3, based on the following criteria: 0 for values below the mean, 1 for values between the mean and +1 standard deviation above the mean, 2 for values between +1 and +2 standard deviations above the mean, and 3 for values above +2 standard deviations above the mean. Areas with scores of 3 had the highest concentration of the coffee house risk factor. Other environmental risk factors were operationalized accordingly, except for "drug related places".

For the "drug related places" risk factor; a density map was created by using Kernel density in the Arc Toolbox. Then, the density scores of the raster cells were reclassified and coded with their risk values. Thus, each cell in the raster grid received a score between 0 and 3, based on the following criteria: 0 for values below the mean, 1 for values between the mean and +1 standard deviation above the mean, 2 for values

between +1 and +2 standard deviations above the mean, and 3 for values above +2 standard deviations above the mean. Areas with scores of 3 had the highest density.

The interpretation of the RTM risk layers is straight forward; the higher a cell's risk value, the higher the concentration of the composite criminogenic features.

Caplan and Kennedy (2010) identified 10 steps to follow in conducting risk terrain modeling techniques. The first step is the selecting of an outcome event, i.e., the residential burglary incidents in this study. Second is the selection of study area and obtaining the base map for that area. This could be a city, a jurisdiction, or even the globe. In this study, the city of Bursa Police jurisdiction areas was selected and its digitized map was obtained.

The third step in RTM is choosing a time period to create risk terrain maps for. This should be done in accordance with the study objectives. If you are interested in crimes against tourists in a study area which attracts tourists only during summer, then it would be meaningful to create maps for the summer season. The time period of data is doubtless a factor to consider. If you can obtain data for specific time periods only, you are limited with that period in your analysis. This study aimed to understand the neighborhood specific risk factors for burglary, and accordingly inform the policy by identifying patterns or typologies of burglaries in differing neighborhoods. It relied on Bursa Police Department crime data from 2007 to 2009. Thus, two time periods were created accordingly. Period 1 (Jan 1ST 2007 to May 31th June 2008, 18 months) data was utilized to assess the risk levels of neighborhoods in period 2 (1ST July 2008 to November 31th December 2009, 18 months). The predictions were compared to those of actual high crime rate neighborhoods. The comparison was done between the burglary rates of

neighborhoods and the accumulated risk value of neighborhoods. Hot spot analysis was also conducted to test the predictive power of RTM over traditional hot spot analysis. Binary logistic regression was used to better understand the predictive validity of the model.

The fourth step involved identifying the risk factors related to the outcome event. Criminological theory and empirical research successfully pointed to the common risk factors –independent variables, for burglary (some of which are discussed above). Local level factors could be a risk factor as well. For instance, the numbers and proximity of coffee shops in Bursa were presently found to correlate with burglary incidents. In arriving at this step, it was important to list as many relevant risk factors as available, however. Selecting among those variables was hence the next step followed.

That is, the fifth step involved selecting the particular risk factors to include in the RTM model. For practical reasons, not all of the potential risk factors were utilized because this step relies heavily on the availability as well as the quality of the data. In practice, this step may not be essential though. Caplan and Kennedy (2010) argued that including all relevant risk factors would not necessarily produce a more predictive model. In selecting the independent variables, they proposed two methods. An ad-hoc method involving the inclusion of risk factors without statistical verification. Regardless of their statistical correlation value, the risk factors derived from theory or literature are then used in the model. The empirical method involves the use of statistical tests to determine the significantly correlating factors. This prior testing approach is used to increase the reliability of the model. In this study, both methods were applied. Common risk factors for residential burglaries were utilized. This step relied heavily on the availability and the

quality of the data. The environmental risk features outlined below were selected on the basis of their statistical correlations with the dependent variable. Table 3.3 represents the results of the chi-square analyses for each crime type. All environmental risk factors were statistically significant ($p<.001$) for the level of each crime category, and had 20% and higher percentile values for the risk factors examined, thus, they were accepted in the RTM model, as recommended by Caplan and Kennedy (2010).

Table 3.3. Consideration of Environmental Risk Factors for RTM

Variables ***Environmental Risk Factors***	**Burglary** ***%Percentile***
Bus Stops	78.20***
Internet Cafes	61.90***
Drug Related Places	40.20***
Coffee Houses	20.30***
Hotels	19.60***
Corrected P-Value	0,005

*p<.05; **p<.01; ***p<.001

As a next step, the correlation tests determined the most relevant factors to consider in the model. Five risk factors were included in the RTM analysis. These risk layers needed to be weighted empirically. This is because different risk factors may be significantly correlated with burglary rates, but taking into account their prevalence and correlation with the outcome event, their weight on affecting the outcome may differ. The next step was thus to weigh the risk factors and reclassify them in accordance with their explanatory significance as regards the outcome. Although in the previous step, the risk factors were selected relative to their statistical correlation with residential burglary, it was still unlikely that every risk factor in the model had an equal effect on the outcome.

Therefore, accepted environmental risk factors were weighted due to the fact that every risk factor in the model did not have an equal effect on burglary rates.

This aforementioned step was applied using the calculation of Relative Spatial Influence (RSI) to determine the effect of each risk factor as regards burglary incidents. Then each risk factor was divided by the least RSI value.

The sixth step in this process was the operationalization of the risk factors to form the risk map layers. In this respect, each place or location based risk factor created a separate layer. For example, if the presence of a bar was deemed a risk factor for burglaries, bars were operationalized as the unit (of analysis). That is, because burglaries occur in close proximity to bars, and hence, any place within 200 ft of a bar could be treated as a high risk area, and every other location could be coded as a low risk area. The Risk Terrain Model enjoys the use of superior GIS software, and can employ very small cells as the unit of analysis. In criminological research it is not rare for street blocks to be used as the unit of analysis. GIS and RTM allows for the selection of one block, half a block or even smaller sites as the unit of analysis. The risk factors are operationalized so as to attribute their values to these cells. The cell value for "the bars risk factor", for instance, was 1, if it was within a 200 ft distance of that cell. If not, the cell value for proximity to bars was coded as 0.

This study used neighborhood as the unit of analysis. Although the GIS and RTM software can treat smaller locations as the unit of analysis, the research objective of this study determined the unit of analysis as the neighborhood. Following the RTM approach and its related analytical strategy, risk terrain maps for burglaries were created, however, this was not the purpose of this study. The specific aim was to understand the

neighborhood level risk factors for residential burglaries and to investigate how differing contexts affect burglaries. That is, the typology of burglary risk in different types of neighborhoods was investigated. Secondly, the demographic variables were only available at the neighborhood level due to the administrative and census structure of Turkey. Therefore, the census risk factors were operationalized at the neighborhood level.

The seventh step required weighting the risk factors and reclassifying them in accordance with their explanatory significance as regards the outcome. Although in the previous step, the risk factors were selected relative to their statistical correlation with the dependent variable, it was still unlikely that every risk factor in the model would have an equal effect on the outcome. More precise predictions rely on carefully weighting the risk factors. The statistical tests should be administered to determine the effect of each risk factor on the outcome event, in the designated unit of analysis, controlling for other variables. This step was carried out through the use of logistic regression which was applied to better understand the effect of each risk factor for burglary in the neighborhoods. To weigh their effect on the dependent variable, the Relative Spatial Influence of the risk factors was computed. New values for each factor were then assigned. The next step involved summing up the factors and combining the risk layers to form a composite map.

The final step involved designing the map for meaningful interpretation. In this study, this step related to classifying the neighborhoods according to their combined risk for residential burglary. It was expected that by using data from period 1, these RTM steps would predict in which neighborhoods burglaries would be likely occur in period 2.

Using ArcView's spatial extension analyst tools, five environmental risk factors were then operationalized into raster map layers. The RTM tool in the ArcView program was used to create a raster grid for each map. Values were assigned to these identical size raster cells. As, Caplan, Kennedy,and Miller suggested, cells within each raster map layer were classified into groups according to standard deviational breaks. This procedure was repeated for all risk factor layers to produce new raster maps of the city of Bursa neighborhoods designated as low to high risk for residential burglary. Since "the cells of different raster map layers were the same size and were classified in a consistent way, they could be summed to form a composite risk terrain" (2011). Each cell value was then summed by using the RTM tool.

In order to test the forecasting ability of the composite risk map and for comparison purposes, hot spot density mapping was conducted. As Kennedy, Caplan, and Piza (2011) suggested, to compare the two maps, the top 10% of high risk or hot cells were investigated.

The purpose of this study was not to prove RTM's predictive power. It aimed to understand how risk is distributed among different social contexts and how that affects burglary rates. In the final analysis, the different neighborhood types were explored. It was believed that if RTM proved to be a better predictor of burglary rates than using period 2 *burglary* numbers and locations, then RTM analysis could be relied upon to select the neighborhoods. Thus, high and low risk, not necessarily high and low crime neighborhoods were explored.

Hot Spots

Apart from the RTM map, *hot spot analysis* was also conducted. In the simplest term, hot spots are areas of concentrated crime events. Hot spots addresses, blocks, or clusters of blocks have been defined and studied in the literature (Eck, Chainey, Cameron, & Wilson, 2005). By using the period 1 crime data, a retrospective hot spot density map was created. The identified risk sites were thought to be the sites that would experience actual burglary incidents in Period 2. This retrospective hot spot map was then compared to the risk terrain map using cross tabulations and Chi-Square tests. It was hypothesized that the high risk cells would have significant levels of future crime events in both the retrospective hot spot maps and the risk terrain maps, but that risk terrain maps would have relatively higher proportions of correct predictions (Kennedy, Caplan, & Piza, 2011.) The top 10% of the hottest cells were selected for comparison.

A retrospective hot spot density map was created. Like the RTM map, it excluded cells that did not intersect with a street and was categorized using standard deviational breaks and coded with a ―risk value from 0 (less than the mean) to 3 (greater than +2 SD). Retrospective maps were compared to the risk terrain map using 2x2 cross tabulations and Chi-Squared tests. It was hypothesized that ―high risk cells would have significant levels of future shootings in both the retrospective maps and risk terrain maps, but that risk terrain maps would have relatively higher proportions of correct predictions (Kennedy, Caplan, & Piza, 2011).

To this point, the ideas from the RTM framework were used to designate high and low risk neighborhoods, because as discussed above, crimes are not distributed evenly. Thus, opportunities for crimes are not distributed equally. Since a “crime opportunity”

can be seen as a "place based risk" factor, it is safe to conclude that the risk of an outcome occurring is not equal across locations. Just as with crimes and crime opportunities, the risk can cluster in certain places, and not others.

Analysis of the Social Context

Informed by the risk factors and clustering among Bursa police jurisdiction neighborhoods, the next challenge in this study was on focusing upon structurally different neighborhoods where the burglary risk clusters. For instance, the shanty town dynamics and their contribution to burglary events were compared to the newly built neighborhoods with multifamily apartment complexes. There is reason to believe that different social environmental contexts in these neighborhoods reveal variations that can affect the rate of burglary events.

This is the key contribution of the Risk Terrain Modeling approach to this research: understanding that variance exists and identifying the neighborhoods where the risk is likely to concentrate. This modeling approach hence provided a critical diagnostic tool.

Moreover, the RTM analysis was followed by a more focused investigation of the effects of the social context on burglary rates by comparing these different neighborhoods. In order to establish whether physical structure and building type of a neighborhood, which I defined as a "neighborhood type", could be informative about the neighborhoods' criminogenic risk factors and varying burglary rates; neighborhoods' risk values and burglary rates were regressed on neighborhood type using OLS regression. Neighborhood risk values were computed by summing up the cell risk values for every neighborhood so as to obtain an aggregated value of neighborhood risk. Neighborhood

types were identified as adjacent-type housing, multi-family apartment complex, shanty housing, and single family housing neighborhoods. Furthermore, there was a discussion about how the relationship between neighborhood type, neighborhood risk value and burglary rates should be structured. I argue that there should be an indirect relationship between neighborhood type and burglary rate, where neighborhood risk value mediates between these factors. That is, neighborhood type should predict (be informative about) neighborhood criminogenic risk value, which in turns would predict neighborhood burglary rate.

Some critical aspects of the social area may not be available in census or crime data, however. For instance, observing the transient population or the unemployed youth on the streets through available data was not possible. The physical layout combined with these social attributes signaled risk to any observant person with common sense. These possible unrecorded conditions, when interconnected with the physical structure and building types of neighborhoods, can thus be treated as risk factors and could help explain burglary risk clusters. Note that the spatial distribution of building structures was not the main interest of the study. However, it was believed that in adding to the first level analysis, more credible and actionable information can be acquired when the effects of the contexts are rethought for structurally different neighborhood types.

The only available socioeconomic data for this research came from the Census data, and as explained above, was collected on a very large scale. The smallest unit, or administrative neighborhood was not small enough to draw meaningful conclusions for the social environmental context. The categorization of Bursa neighborhoods into four distinct types has never been done before. Through my police ‘ride alongs’, I coded each

neighborhood into a single category based on their physical layout and structure. This physical structure was thought to be linked to the social life and context in the neighborhood, which may be related to the occurrence of burglaries. This hypothesis was tested with the available data and methods. This was done because, even if this reasoning is accurate, we still need more data to understand why "easily identifiable physical differences of neighborhoods" relate to the event of a burglary. To bridge this gap, it was felt the best available tool would be the inclusion of another data source: namely, systematic field observations.

The resultant systematic observations were planned and conducted as follows:

- All observations took four weeks in total. I spared around a week for each neighborhood type; Adjacent-type middle-class structures; Multi-family apartment complexes; Shantytowns; and Single-family housing areas.
- Temporal variations of the neighborhood life were consistently studied. In each neighborhood, observations were planned over three time-periods: (1) Morning time-usually at 8:00-9:30 am; (2) Afternoon-14:30-16:00; and (3) Evening time-usually around 19:00-21:30.
- Observations were usually made on foot, but sometimes I drove my car or took a bus to see the flow of life, and people in their daily routine. Those observed areas included sites I used as environmental risk factors for the current RTM analysis: including, bus stops, hotels, internet cafes, coffee houses, and drug related locations. In addition to

these risk factors, other locations such as buildings and/or houses, streets, recreational areas, public transportation hubs, and shops (shopping malls, other types of smaller shops,) were also observed. Notes were taken sometimes during the observation, but were mostly recorded at the end of the each day.

Variables and Operational Definitions

The dependent variable for the present study was obtained from the police crime data that included all reported residential burglaries in the 2007-2009 period. The independent variables of this study were the possible risk factors at the neighborhood level. In that regard, it may be argued that the single independent variable of this study was the environmental *risk in the neighborhoods*. It was proposed that the accumulated risk in the neighborhoods would be related to the rates of burglary incidents. To test this belief, several risk factors were used. In the literature, similar variables have been used as correlates of burglary rates. This study treated these correlates as individual risk factors.

Two data sets were used: census data that included socioeconomic variables collected at the neighborhood level, featuring environmental data, and obtained from the police department, that included the X and Y coordinates of the critical locations. Environmental data were adapted for current analytic use by using ArcGis software.

Dependent Variable: Reported Burglary Incidents

In 165 neighborhoods of Bursa, there were 3534 reported residential burglaries for Period 1 (January 01, 2007 to June 30, 2008) and 3938 burglaries for Period 2 (July 1,

2008 to December 31, 2009). Since the Census data were obtained from 2000, the nearest and best collected crime data were available in this timeframe. All commercial burglaries and attempted residential burglaries were exempt. The numbers of burglaries only reflected those reported to the police.

When a burglary occurs, usually the tenants or the neighbors report it. For every reported incident, uniformed officers from the nearest police station are dispatched to the site. The officers examine the crime site, designate the point of entry, and write a report. The incidents are given an incident number and police officers have to fill out a predesigned electronic query form through the intranet system. The system is designed in a way that officers have to fill out every necessary input field. Therefore, the missing data problem is minimized. One of these input boxes is the coordinates. An officer has to point out the exact location of crime on the digital map. Thus, each burglary can be associated with its X and Y values.

Social Disorganization: Proxy Measures

Benefiting from the social disorganization theory constructs, this study used neighborhood level proxy measures to assess the collective efficacy and residential stability of neighborhoods. These measures were the educational level of a neighborhood's residents, the rate of unemployment, the divorce rate, the rate of home ownership, and the population density.

Education: The data files contained information about literacy and school degrees of neighborhood residents. Of those persons reported as being of 12 years of age and older, 93% were literate, 41% had a primary school degree, 10% had a middle school degree, 17% had high a school degree and 7% had a college degree. The percentage

without a middle school degree variable was created to serve as a proxy measure for socio-economic status, a key concept in social disorganization literature.

Employment: Of persons 12 years of age and older, 59% of males and 18% of females were employed. People on the work force are predominately male. In addition to the education variables, a "percent male unemployed" variable was created to measure the socio-economic status of neighborhood residents.

Marital status: Weakened family ties were shown to be related to higher rates of criminality. The data set includes detailed information on the marital status of people. The "Percent divorced" variable was used as a proxy measure for family disruption, another key variable in social disorganization research.

Density and home ownership: One of the key concepts in social disorganization theorizing deals with the instability of neighborhoods. This residential stability construct was measured by creating two proxy measures of "population density (population per square kilometer) and "percent renter". The population of the city and the neighborhoods were available for two different years: 2000 and 2007. Since the neighborhood characteristics variables were only available for the 2000 data set, 2000 population figures were used. Population was defined as the total number of persons living in a neighborhood, and population density as the number of persons per square kilometer. The lowest number of people per square kilometer was 112, and the highest population density score was 68489.

Census 2000 included neighborhood level information on the number of households in the neighborhood. The lowest number of households in a neighborhood was 91, whereas the highest was 9129.

Local Risk Factors

It was proposed that the neighborhoods with more coffee houses and internet cafes would be at a higher risk for residential burglary. In measuring the effect of those sites, it would not have been accurate to just simply sum these for every neighborhood. Note that the RTM can treat very small geographic locations as the unit of analysis. However, since all other census independent variables were defined at the neighborhood level, the coffee houses and the internet cafes risk factors also needed to be assessed at the neighborhood level as well. To measure the risk value, I created a "coffee houses" and a "cafes" variable using the following formula:

$$\frac{\textbf{number of coffee houses (or cafes) (neighborhood)/neighborhood population}}{\textbf{number of coffee houses (or cafes) (city)/city population}}$$

Thus, every neighborhood could be allocated a "coffee houses" and "internet cafes" value calculated with regards to the population. It was proposed that the higher this number was, the higher the risk for burglary would be.

The data also included environmental variables, which could be operationalized and used in the GIS software. The digital map of the city included the locations of coffee shops and internet cafes, hotels, and bus stops. The following "places", and risk factors are thought to be relevant to the examination of residential burglary issues. Table 3.4 demonstrates each risk factor's weighted value.

Table 3. 4 Relative Spatial Influence of Selected Risk Factors

Environmental Risk Factors	# of Burglary	of all cells	RSI	Risk Factor's Weight
Coffee Houses	177	462	0,383	2,4
Hotels	177	463	0,382	2,4
Drug Related Places	330	1188	0,278	1,8
Internet Cafes	469	1795	0,261	1,7
Bus Stops	612	3862	0,158	1

The "bus stops" as an environmental risk factor had the lowest RSI value of 0.158. Thus the risk factors were weighted. Some of the cells did not have any of the risk factors located in them (i.e: schools, bus stops, café etc.) To increase the validity and power of the study, the cells that did not intersect with streets were excluded from the analyses.

According to the Chi Square tests, the bus stops risk factor had the highest percentage scores. When weighted, the "coffee houses" risk factor had the highest value.

Table 3. 5 Operationalization of the Environmental Risk Factors

ID#	Variable	Additional info for operationalization	
1	Bus Stops	Distance	two streetblocks for Bursa, (140 m X 140 m, average street block is 70m)
2	Internet Cafes	Distance	
3	Coffee Houses	Distance	
4	Hotels	Distance	
5	Drug Related Places	Density	+2 standard deviation

The above table shows the variables of interest in this analysis, and how they were operationalized. The distance variables were operationalized within two streetblocks, approximately 140 X 140 m cell. If there was a point feature representing the risk factors inside this cell, a risk value was attained accordingly. The higher the number of these risk factors, points, in a cell, the higher the risk value. The last variable

to be considered was the variable termed “drug related places” and this was investigated in terms of density.

Duru (2010) noted an average street length in Bursa was 70 meters. Darcan (2012) utilized RTM for his study in the same setting, and identified two street blocks as the appropriate grid cell size. This study also used two street blocks cells, or 140 meters squared. The unit of analysis in this study was neighborhoods, yet in order to enhance the understanding of the environmental dynamics and increase the power of interpretation at that level, cell blocks consisting of 140 x 140 meters were used in obtaining data concerning the various risk factors examined in the study. In a sense, the cell blocks were used as a unit of analysis in the operationalization of neighborhoods in the current data analysis.

Strengths and Limitations

This study is limited in many ways. First, it excludes commercial and attempted burglaries, and includes only the residential burglaries reported to police. Second, its scope is limited to the neighborhoods of Bursa. Third, recent demographic data are not available. The neighborhood level variables are from 2000. Fourth, the social disorganization proxy measures are only available at the neighborhood level. The neighborhoods are relatively large and most often heterogeneous in many ways. Results may have been more accurate if the neighborhood measure had been smaller.

Although the study is also limited by the quality and availability of certain data, this study may help us to better understand the residential burglary risk factors that exist in different social contexts. While the design followed previous urban crime research in detecting individual neighborhood level correlates of residential burglary, it added an

innovative strategy, however to this, namely the RTM approach. This novel approach thus adds to the research using traditional models used in this type of research. The study also focused on specific neighborhoods and examined the effects of social context, and the findings provide evidence in support of different typologies for different risk clusters.

Summary

Data were acquired from the Bursa Police Department and Turkish Statistical Institute. There were three major questions for this study, and they helped to guide the analytic plan. The unit of analysis was the neighborhood. In order to detect the predictors of burglaries at the neighborhood level, 1) bivariate correlation tests were conducted; 2) and hot spot maps were compared to risk terrain maps. Data from period one was utilized to select the correlating risk factors, and the produced model tried to forecast the actual burglary incidents for data period two. The predictive power was tested by using binary logistic regression. 3) drawing on the systematic observation of different types of neighborhood social contexts, and the variance for the risk of burglary was explored. These neighborhoods were investigated more thoroughly and the different typologies that emerged are presented. This study was limited as regards the availability and the quality of the data, and was conducted only at the neighborhood level. Regardless, it uses RTM as an innovative strategy and this helps us understand the effects of different social contexts on residential burglaries.

CHAPTER 4: RESULTS

Since the first research question of this study tried to answer and identify the neighborhood characteristics (risk factors) predicting residential burglaries, bivariate correlation analysis was performed to examine the strength and direction of any relationships between the set of independent variables and dependent variable, that is, burglary rates in the police jurisdiction areas of the city of Bursa. The Pearson test was used since this is the most appropriate method for correlation analysis between variables that interval or ratio scale values. Since the significance level for this study was set as.05, any correlations between variables with corresponding p values below .05 indicated a statistically significant relationship.

Correlates of Residential Burglary

Bivariate Analysis

The table below illustrates the correlation matrices between the independent variables and the dependent variable of the study. Positive correlations were found between population density and burglary rates, and building density and burglary rates (.265 and .268 respectively, $p < .01$). The results reveal positive and significant relationship between the burglary rates and the number of households. The higher the number of households, the population and the building density, the higher the risk of burglaries.

In respect to relationships between the burglary rate and divorce rate variables, the Correlation Analysis Table revealed positive and statistically significant correlations

at the.01 significance level. This result indicates that neighborhoods where increased numbers of divorced people reside are more vulnerable to burglary offenses.

Table 4. 1 Correlation Matrix, Census Variables and the Burglary Rate

Correlations Matrix Between Dependent and Independent Variables

		Burglary Rate	Divorce Rate	Education Low Level	Education No Degree	No of Household	Building Density	Other Born Rate	Renter Rate	Coffee House Rate	Internet Coffee Rate	Total Cafe	Population Density
Residential Burglary Rate	Pearson Correlation	1	,233**	0,111	,219**	,158*	,268**	,192*	,178*	,184*	,177*	,192*	,265**
	Sig. (2-tailed)		0,003	0,157	0,005	0,043	0,001	0,013	0,022	0,018	0,023	0,013	0,001
	N	165	165	165	165	165	151	165	165	165	165	165	165

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

A similar pattern was observed between the burglary rate and percent of other born variable. There was a significant and positive correlation at the $p < .05$ level with a corresponding value of .192. Significant and positive correlations exist between burglary rates and percent renters with a corresponding value of .178 at $p < .05$. Thus, the higher the percentage of renters, the higher the numbers of residential burglaries. This statistics is consistent with the arguments mentioned in the literature that residential mobility, weakened ties and low levels of social cohesion are the risk factors that reduce control in a neighborhood and diminish territoriality (Sampson, Raudenbush, & Earls, 1997).

Another important finding of the study was that the percentage of people with no educational degrees correlated with the residential burglary rate. It can be argued that low education neighborhoods are the ones with lower incomes. The result is also consistent

with The National Crime Victimization Survey (NCVS) estimates that the risk of burglary is higher in lower income households.

As mentioned in the local risk factors section of the study, the number of coffee houses and internet cafes correlated with burglary rates. Positive and significant correlations were observed between the burglary rates and presence or absence of coffee houses and internet cafés (.184 and .177 respectively at $p < .05$). These results indicate that neighborhoods having more internet café and coffee houses are more likely to be targeted for burglary offenses.

Multivariate Analysis

The overall models were statistically significant (Wald Chi Square tests). The variables which were significant determinants of residential burglary were divorce rates, education level, numbers of households, building density, population density, proportion of renters, and total internet and coffee houses. The statistical results for each variable is shown in Table 4.2, yet only the significant predictors are interpreted.

Although the model was found significant, the explained variance of the census variables on residential burglary was low (Pseudo R Square= .075). This finding may suggest that there are other factors that should be included in the equation to explore the burglary phenomenon more intensively.

Table 4. 2 Negative Binomial Regression Coefficients Predicting the Expected Burglary

Variables	Model 1			Model 2		
	β	Std.Err.	p > |z|	β	Std.Err.	p > |z|
Divorce Rate	**15.518**	**5.381**	**0.004**	**16.635**	**5.148**	**0.001**
Proportion of Population with Low Education	0.401	0.442	0.364	0.398	0.443	0.37
Proportion of Population without any Educational Degree	**4.541**	**1.366**	**0.001**	**4.624**	**1.365**	**0.001**
Percentage of Unemployed	0.006	0.011	0.616	0.006	0.011	0.58
Percentage of Single Person Household	**2.629**	**0.895**	**0.003**	**2.492**	**0.871**	**0.004**
Building Density	**1.38E-04**	**4.32E-05**	**0.001**	**1,43E-01**	**4.29E-05**	**0.001**
Population Density	**0.01**	**0.005**	**0.034**	**0.009**	**0.004**	**0.044**
Percentage of Population Born Outside Bursa	-0.006	0.003	0.089	-0.006	0.003	0.078
Percentage of Renters	**0.018**	**0.006**	**0.003**	**0.018**	**0.006**	**0.003**
Coffee Houses	0.023	0.015	0.127	-	-	-
Internet Coffee Houses	0.148	0.169	0.379	-	-	-
Total Houses (Internet & Coffee)	-	-	-	**0.028**	**0.013**	**0.031**
Constant	**1.002**	**0.471**	**0.033**	**0.986**	**0.471**	**0.036**
In α	-1.69	0.167		-1.686	0.166	
A	0.185	0.031		0.185	0.031	
N (Number of Observations) X^2 LR	150			150		
Wald Chi Square- (Prob > X^2)	75.77 (.000)			75.24 (.000)		
Pseudo- R^2	0.075			0.074		
LR test of α = 0:	$\bar{x}^2(01) = 167.01$ $Prob \geq \bar{x}^2 = .000$			$\bar{x}^2(01) = 167.07$ $Prob \geq \bar{x}^2 = .000$		

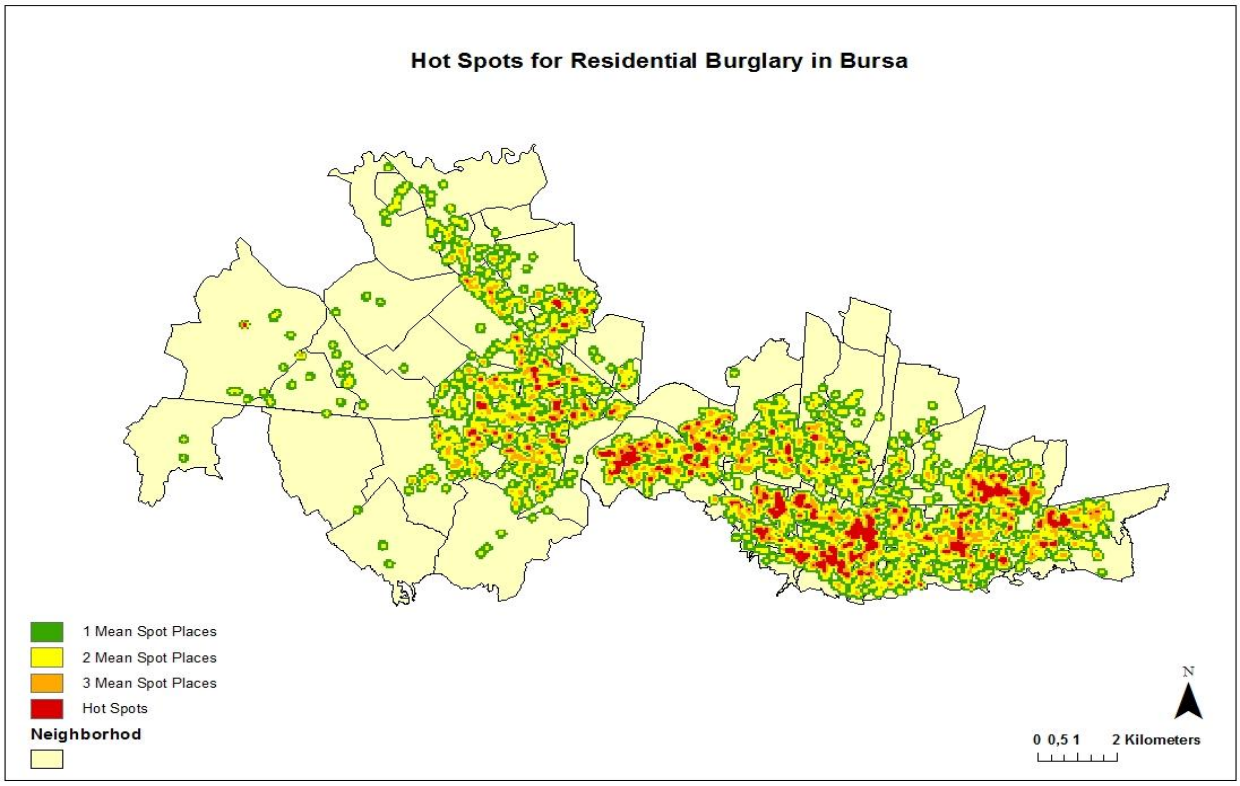
Risk Terrain Modeling vs. Hot Spot Analysis

The second research question was: As a methodological approach, is using environmental factors and social factors incorporated in a risk terrain model more predictive of future crime than prediction through present crime hot spots?

The answer to this question is important in many ways. First, it may provide a better method in the study area context to explore the "relevant" location in depth. Since the final stage of this research aimed to explore the different social areas and their effects on burglary events, it is therefore essential to demonstrate the presence of these "contexts" and ultimately present a method that can accurately select these areas. Secondly, the census variables used in the first stage of the analysis and the model they produced were significant. However, the model was only useful statistically for explaining low proportions of residential burglaries.

Map 2 shows the residential burglary concentration areas, and hot burglary locations of Bursa, created for period 1 data. The red areas have the highest burglary rate concentrations.

Map 2 The Hot Spot Map, Bursa



After creating the hot spot density map, a risk terrain map was produced (Map 3). The risk values were computed for each cell (cells not intersecting with a street are excluded). The occurrence of the outcome event, and residential burglary incidents that fell on to these cells was then noted.

Map 3 shows the risk terrain composite map for residential burglaries in Bursa. It was created by the inclusion of five environmental risk factors: bus stops, internet cafes, drug related places, hotels, coffee houses, in relative weighted order, from low to high.

Binary logistic regression analyses was used to understand if the burglary events were significantly more likely to occur in the higher risk cells. A Binary Logistic Regression was run for the risk terrain forecast period using "Risk Value" as the independent variable and "Presence of Residential Burglary" (Yes or No) as the dependent variable.

As shown in Table 4.2, the odds ratios suggested that for every increased unit of risk, the likelihood of a residential burglary significantly increases by at least 39% ($p < 0.000$).

Table 4. 3 Logistic Regressions for Risk Value on Residential Burglary

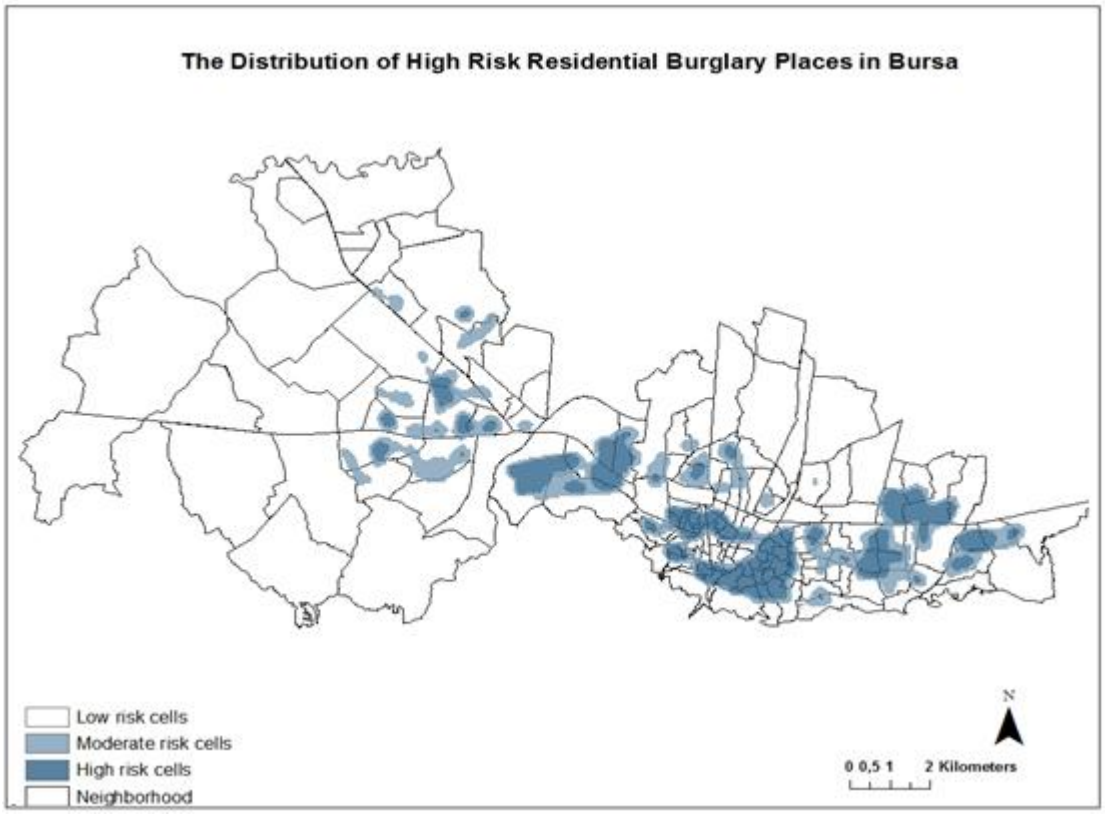
							95% CI for Exp(B)	
	B	**SE**	**Wald**	**df**	**Sig.**	**Exp(B)**	**Lower**	**Upper**
Risk Value	0.329	0.029	130.35	1	0	1.39	1.314	1.471

−2 Log likelihood = 832.235; Nagelkerke R square = .316; N = 8324 street-intersected cells.

To compare the predictive power of hot spots and risk terrain maps, Period 2 burglaries were created for to both maps. Cells that had burglaries were listed. The top 10 percent of the cells were selected (n= 848). Cell size was 140 x 140 m. As much as 14%

more burglaries occurred in high-risk cells predicted by the risk terrain map compared to the retrospective map. When compared, RTM predicted burglary rates predicted this more ably than the retrospective hot spot map. The top 10 percent of hot cells predicted 19% of the burglaries, while the top 10 percent of high risk cells correctly predicted around 33% of the burglaries.

Map 3 The Risk Terrain Map for Residential Burglary, Bursa



Distribution of Burglary Risk over the Neighborhood Type

To this point, the results for the first and second research questions are reported below. The hot spots and RTM comparison provided an enriched tool for observing and exploring the social areas regarding the risk of burglaries. However, the focal point of this research was to observe whether there was a relationship between the variance in social context and the residential burglary event rates. To this end, it was important to

observe the distribution of burglary risk over various neighborhoods. It was of interest to understand if the risk was distributed evenly, or randomly, or, if there was any pattern that could explain the risk in neighborhoods? These were challenging questions.

It is important at this point to turn back to the neighborhood type discussion. There were 165 neighborhoods in the study area. These were the lowest administrative and census units. In the previous chapters I discussed the physical structural differences in these neighborhoods that may also outline differences in the social structure. For instance, people would not build shanty houses if they had enough financial resources. The differences in physical layout of neighborhoods offer grounds to support the view that the social context of these neighborhoods differ, as do the criminogenic opportunities and social control among them.

Table 4. 4 The Classification of Neighborhoods into Four Categories

Neighborhood Type	Area (Square Meter)	Number of Neighborhoods	Percentage of the Area
Shanty Housing	24.594.431	9	15,1
Adjacent Type Housing	54.324.081	117	33,34
Multi-Family Apartment Complexes	30.126.199	21	18.49
Single Family Housing	53.889.941	18	33,07
Total	162.934.652	165	100

Four types of structurally different neighborhoods were studied 1) Shanty areas, 2) middle class adjacent type housing, 3) multi-family apartment complexes, and 4) single family housing. First, I have visited all these neighborhoods, and rode alongside the police officers in a patrol car to observe the building structure of the neighborhoods. All 165 neighborhoods were then coded accordingly. The coding of the neighborhoods

was also confirmed after discussing these with two experienced patrol officers working at the larceny unit of Bursa Police Department.

Shanty areas were coded as category 1, adjacent type structures as 2, multi-family apartment complexes as 3, and finally single family hosing neighborhoods were assigned the number 4. In Map 3, these neighborhoods are color coded.

In order to establish whether there were any significant differences across neighborhood types in terms of criminogenic risk factors and burglary rates, some statistical tests were conducted. Before proceeding with the statistical tests, some clarification about the line of thought as to the direction of the relationship (or the causal relationship if any) among the variables was necessary. First of all, the grounds for the direction of the relationship between neighborhood risk values and burglary rates was based on facts established in the previous sections. That is, the corresponding risk values were expected to predict (or cause) neighborhood burglary rates. The essential question here was how neighborhood type related to these neighborhood risk values and burglary rates.

As framed above, the physical structure may reflect the nature of the social structure and context in a neighborhood. Thus the physical structure, or the neighborhood type in the present case, was expected to be predictive of burglary rates. That is, on the one hand, neighborhood type might be regarded as a criminogenic risk factor, and should have been incorporated into the calculation of the neighborhood risk values. However, when the attributes (coffee and Internet houses, bus stops, hotels and drug related places) of the risk values were taken into account, a more plausible approach was to treat neighborhood type as a predictor of the neighborhood risk values. Logically and

apparently, physical structure and thus the social structure temporally and spatially preceded places identified in this study as environmental risk factors. Furthermore, it could also be argued that the availability and intensity of environmental risk factors in a neighborhood is dependent on the demands of the inhabitants of the neighborhood. Therefore, the social structure (which is also reflected in the physical structure) would be expected to predict neighborhoods' criminogenic risk values.

Table 4. 5 Comparing Neighborhood Types with respect to Criminogenic Risk Values using OLS Regression (N = 165)

	β	SE	P>IzI	β	SE	P>IzI	β	SE	P>IzI	β	SE	P>IzI
Adjacent Type Housing	4.5	2.2	0.04	-2.7	3	0.35	-8,44	2,021	0	-	-	-
Multi-Family Apartment Complexes	13	2.7	0	5.7	3.4	0.1	-	-	-	8,44	2,021	0
Shanty Housing	7.2	3.5	0.04	-	-	-	-5,70	3,398	0.1	2,74	2,950	0.35
Single Family Housing	-	-	-	-7.2	3.5	0.04	-12,9	2,739	0	-4,48	2,159	0.04
Constant	4.9	2	0.02	12.1	2.8	**0**	18	1.86	**0**	9.4	0.79	**0**

R^2 = **.136**

Table 4. 6 Comparing Neighborhood Types with respect to Burglary Rates using OLS Regression (N = 165)

	β	SE	P>IzI	β	SE	P>IzI	β	SE	P>IzI	β	SE	P>IzI
Adjacent Type Housing	6,21	10,05	0.538	7,71	13,74	0.575	-24,9	9,41	**0.009**	-	-	-
Multi-Family Apartment Complexes	31,09	12,76	**0.016**	32,59	15,82	**0.041**	-	-	-	24,88	9,411	**0.009**
Shanty Housing	-1,50	16,21	0.926	-	-	-	-32,6	15,82	**0.041**	-7,71	13,74	0.575
Single Family Housing	-	-	-	1,50	16,21	0.926	-31,1	12,76	**0.016**	-6,21	10,05	0.538
Constant	7.39	9.36	0.431	5,89	13,24	0.657	38,48	8,67	**0**	13,60	3,671	**0**

R^2 = **.051**

Hence, in order to examine whether there were significant differences between neighborhood types in terms of environmental risk values and burglary rates, two OLS

regression models were run where neighborhood type was the independent, and the risk value and the burglary rates were the dependent variables, respectively. Since, there were four neighborhood types, one of them was served as a reference group in the analyses. In order to make a pairwise comparison between neighborhood types, for each model, 4 regression analyses were run where each neighborhood type was left as a reference group, one at a time (Table 4.4 and Table 4.5). When these analyses are examined, it can be seen that neighborhoods characterized as single family housing were associated with significantly lower risk values compared to all other neighborhoods. While shanty housing neighborhoods were not significantly different from neighborhoods with adjacent type housing and multi-family apartment complexes in terms of criminogenic risk value, neighborhoods with multi-family apartment complexes were associated with significantly higher risk values compared to adjacent type housing neighborhoods. There seems to be an inconsistency in these last findings. According to the rule of transitivity in mathematics and logic[1], if adjacent type housing neighborhoods are no different than shanty housing neighborhoods and shanty housing neighborhoods are no different than multi-family apartment complex neighborhoods, then so should adjacent type housing neighborhoods and multi-family apartment complex neighborhoods, that is these last two should not be significantly different in terms of criminogenic risk value.

When neighborhoods were compared in terms of burglary rates, multi-family apartment complex neighborhoods were associated with significantly higher burglary rates compared to all other neighborhood types. All other neighborhoods (adjacent type,

[1] If A = B and B = C, then A = C. Similarly, the same implication is expected to hold for "<" (less than) and ">" (greater than).

shanty, and single family housing) were not significantly different from each other in terms of burglary rates when compared using pairwise strategies.

Neighborhood type had a greater degree of explanatory power for the neighborhoods' risk values. While neighborhood type explained 14% of the variation in the risk value (R2 = .136), it explained only 5% of the variation in the burglary rate (R2 = .051). Therefore, as also argued above, an indirect relationship between neighborhood type and burglary rates through neighborhoods criminogenic risk value seems to be a more plausible explanation. The OLS regression results representing this relationship is provided in Table 4.6 and are visually illustrated in Maps 4 and 5.

Table 4. 7 OLS Regression Models Predicting Neighborhoods' Criminogenic Risk Values and Burglary Rates (N = 165)

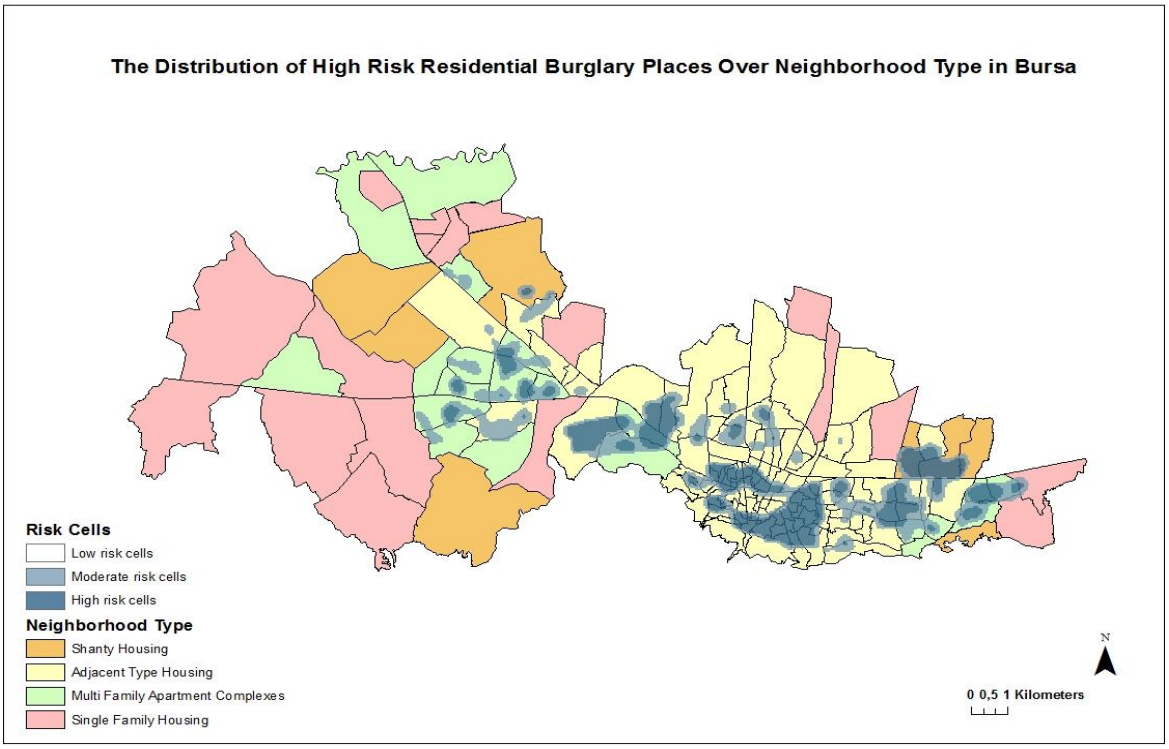
	DV = Burglary Rates (Per 1000 population)			**DV = Risk Value**			**DV = Burglary Rates (Per 1000 population)**		
	β	**Std.Err.**	**P**	***β***	**Std.Err.**	***p***	***β***	**Std.Err.**	***p***
Adjacent Type Housing	6,209	10,054	.538	4.479 (.225)	2.159	**.040**	-	-	-
Multi-Family Apartment Complexes	31,087	12,755	**.016**	12.921 (.475)	2.739	**.000**	-	-	-
Shanty Housing	-1,500	16,211	.926	7.222 (.181)	3.482	**.040**	-	-	-
Risk Value	-	-	-	-	-	-	1.782 (.401)	.319	**.000**
Constant	7,389	9,359	.431	4.889	2.010	**.016**	-2.341	4.326	.589
R^2	.051			.136			.161		

Numbers in parentheses under the columns of β coefficients are standardized coefficients
Single family housing neighborhoods left as the reference group

As can be seen from the regression results, neighborhood type explained 14% of the variation in the risk value (R2 = .136), which in turn explained 16% of the variation in the burglary rates (R2 = .161). The indirect effect of multi-family complexes on burglary rates for instance, was computed as the product of the standardized β coefficients along the corresponding paths, that is, (.457) × (.401) = (.190) (Figure 1). This result can thus be interpreted as follows: on average, a neighborhood with multi-family apartment complexes experiences (.19) standard deviation higher burglary rates than a single family housing neighborhood.

To sum up, all the above analyses and discussions suggest that single family housing neighborhoods are safer than other neighborhood types as they are associated with lower levels of criminogenic risk and burglary rates. Although not a consistent finding across all the analyses, it can also be argued that neighborhoods with multi-family complexes are riskier than adjacent types and shanty type housing neighborhoods as the former tend to have higher risk values and burglary rates.

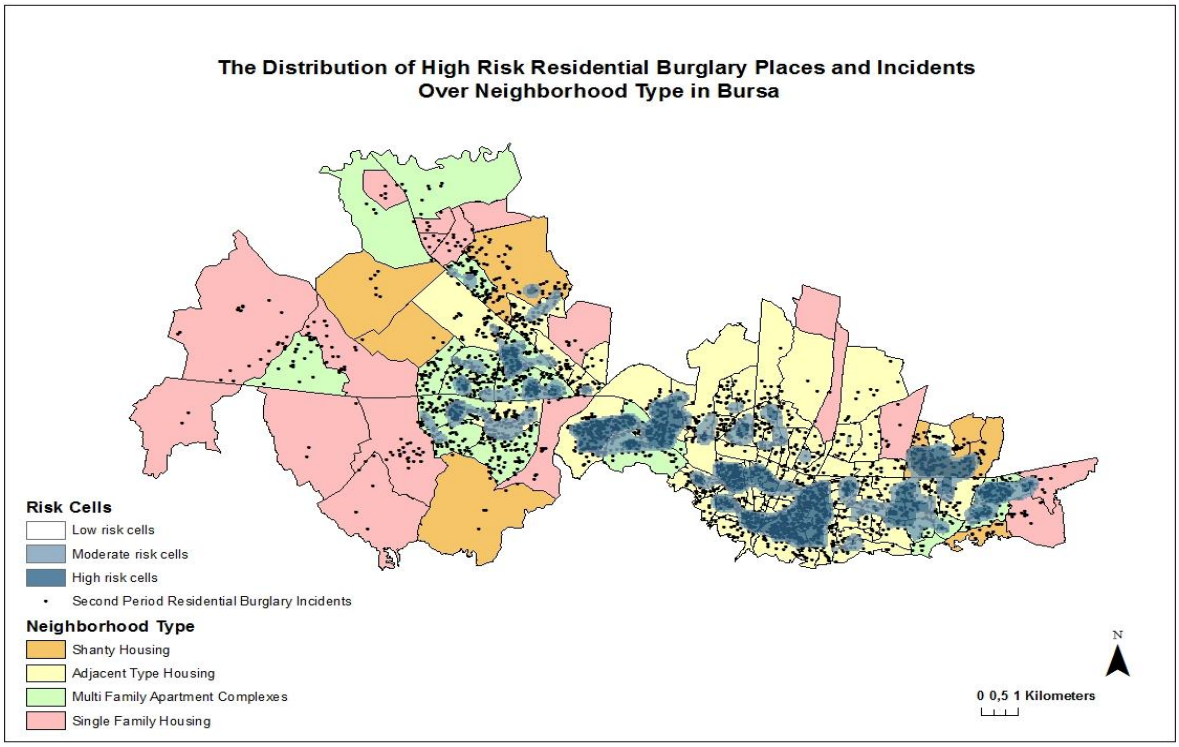
Map 4 The Risk Terrain Map over Neighborhood Types, Bursa



The risk terrain map layer was then reflected on the colored neighborhood map. Map 3 presents the visual distribution of risky places over neighborhoods. As the OLS regression analysis showed, the risk for burglary seemed to be mostly distributed over type 2 (adjacent type) and type 3 (multi-family complexes) neighborhoods.

Single family housing areas did indeed experience residential burglary incidents, but, the risk terrain analysis defined these areas as low risk. The outskirts of the city reflect a lower risk than the center. Nine neighborhoods were identified as shanty zones. Out of the nine, four did not pose any moderate or high risk. One shanty neighborhood showed a clustering in a small zone, and the others shared a larger risk cluster among them.

Map 5 The Risk Terrain Map over Neighborhood Types and Incidents of Residential Burglary, Bursa



Most of the burglary risk clustered in the multi family apartment complexes and adjacent type zones according to the present data. The larger risk clusters appeared to be on the adjacent type neighborhoods. There are large colored clusters on the map, because the high risk cells are concentrated in these neighborhoods. However, not all cells on these clusters have the same risk value. In the following chapter, the field observations for neighborhood types and their relationship to possible risk factors is discussed in depth.

Summary

The analytical plan of the study was driven by the research questions discussed earlier. First, bivariate correlations and multivariate relationships between predictors of residential burglary in the neighborhoods of Bursa were investigated. The statistical tests yielded significant positive correlations with the social disorganization proxy measures and the burglary rates. Second, environmental variables were introduced, and two types

of maps were created: a traditional hot spot density map, and risk terrain map. The comparative binary logistic test and chi square results proved the RTM analysis was a better predictor of future burglaries. Third, the accumulated risk value and burglary rates for the neighborhoods were regressed on neighborhood type. Finally, the composite risk outcome and the actual burglary locations were layered on the color coded neighborhood type map. This revealed that when compared to single family housing neighborhoods, all other neighborhoods had adjacent type neighborhoods and multi-family apartment complexes had the largest risk clusters. Shantytowns revealed mixed results, some having risk clusters present. Single family neighborhoods were not conducive to a high risk of residential burglary.

CHAPTER 5: DISCUSSION

The literature on crime analysis has overwhelmingly stressed that crime is not evenly distributed among places, victims, or offenders (Johnson et al., 2007; Sherman, Gartin, & Buerger, 1989). Specifically ecological studies point out that large amounts of crime occur in disadvantaged neighborhoods. Informed by this approach, this study identified the neighborhood level correlates of residential burglaries in the city of Bursa, Turkey, by using Risk Terrain Modeling as the analytical tool to explore the social contextual differences.

Bernasco and Luykx (2003) identified two lines of investigation pertaining to the perception of burglars which ultimately determine burglary locations. One, they sum up and describe as studies of the journey to crimes; and the other as the "ecological approach", which uses burglary incidence rates from police data and relates residential burglary rates to understand neighborhood attributes, which when taken together explain "opportunity".

Opportunities for burglaries at the neighborhood level may be characterized by investigating two different sets of variables. Census data provide attributes for the neighborhoods at a larger level; and the featured data encompass the geographical locations of environmental risk factors. Both of these data sets were used separately in answering the first and second research questions. The unit of analysis in this study was "neighborhood". This was defined as "mahalle", the smallest administrative unit in Turkey. Census variables can only be obtained at this level. Police data also include feature variables (location of coffee houses etc). The GIS software allowed the researcher

to use these variables and work with smaller units, so that 140 meter squared cells were created.

Correlates of Residential Burglary

The present data showed neighborhood level variables correlated with the residential burglary. This type of macro level research has been popular in the criminal justice literature, and many studies have investigated the neighborhood or city level predictors of criminal activity. Among these correlates, including increased number of divorced people, population density, building density, residential mobility, the numbers of coffee and internet shops, the rates of uneducated households, the rates of single person households, and percentage of renters, were all found significantly related to the rates of burglaries. These data were consistent with the findings of several previous studies (see for example Bernasco & Luykx, 2003; Catalano, 2010; Cromwell & Olson, 2004; ; Felson, 1998; Sampson, Raudenbush, & Earls, 1997; Weisel, 2002).

Divorce rate is a social structural variable used to measure the level of family disruption in a given neighborhood. According to the Social Disorganization Theory, neighborhoods with higher levels of family disruption are more prone to crime. In this present analysis, divorce rate was found to have a positive statistically significant effect on residential burglary rates, implying that neighborhoods with higher divorce rates tend to experience higher rates of residential burglaries on average, which is consistent with the theory's expectation.

An interesting finding has been observed regarding the relationship between building density and population density at one hand, and residential burglaries on the other hand. Both of these density variables were presently statistically significant with a

positive sign, implying that the higher the level of building density or population density, the higher the incidence of residential burglary. This finding supports our expectation pertaining to the effect of social cohesion as explained in the Major Correlates of Residential Burglary section. As a rule, social cohesion would be expected to be lower in crowded areas where population and building densities are high, such as public housing, urban areas, etc. In places where the social cohesion level is very low, residents do not look after others' properties and may not know who their neighbors are. Therefore, we would expect that in places where population and building density levels are high, the residential burglary rates would be high as well. This finding is consistent with the results of Markowitz, Bellair, Liska, and Liu (2001), who found a significant relationship between urbanization and burglary. Kikuchi (2008) has also found a positive relationship between burglary and residential mobility. In dense geographical locations, people may not be alarmed by other peoples' presence and may not take any actions to intervene. The victim loses the power of familiarity, while the burglar is empowered by anonymity.

Of the two education variables: proportion of the population with low education and proportion of the population without any educational degree, only the latter turned out to be statistically significant. This finding suggests that as the proportion of people without any educational degree increases in a neighborhood, so do the expected residential burglary rates.

As Howard (2006) found in his study on the relationship between burglary rates and social disorganization, among other variables, single person households was the best correlate of residential burglary. Likewise, in this study, the proportion of single person household was also found to be significantly and positively associated with residential

burglary rates. That is, neighborhoods with a higher proportion of single person households appear to have higher rates of residential burglaries. There could be two explanations for this finding. One would be related to family disruption, where higher divorce rates might lead to higher rates of such households. Another explanation might come from the Routine Activities theory, which would predict that the absence of capable guardianship during work hours would make such households a highly attractive target for burglars.

The proportion of renters is another variable found to be statistically significant and positively associated with the expected burglary rates. The proportion of renters was used to account for the residential mobility of the neighborhoods. Places with higher residential mobility are characterized with lower levels of social cohesion, which attracts potential offenders to commit burglary.

As mentioned in the local risk factors section of the study, the nature of the local social life might be used to predict what types of criminal activities to expect. Coffee houses, historical places where people can spend long hours with their peers and friends are found to be correlated with certain types of crimes. Internet cafes are also considered as risk factors for some specific crimes. Our findings are also consistent with this expectation. We found that total internet and coffee houses were significantly and positively associated with the expected residential burglary rates, implying that neighborhoods with higher number of internet and coffee houses experience higher rates of residential burglary.

Analyses conducted to understand the spatial influence of selected risk factors have previously focused on coffee and internet houses, hotels, drug related places, internet cafes and bus stops.

In this present study, the number of coffee and internet houses in the neighborhood also increased the likelihood of burglaries. These results are consistent with the finding of Duru's (2010) study. He found significant positive correlation between the number of coffeehouses on a street block and the number of burglaries on that street block. Coffee houses and internet cafes are the places that attract predominately young unemployed males. Duru (2010) found a significant positive correlation between the number of coffeehouses on a street block and the number of burglaries on that street block. By attending to a coffeehouse or an internet café, in a specific neighborhood, potential offenders may acquire specific information added on their personal observation. As discussed, potential burglars may turn into active burglars by getting in touch with active or former burglars. Such sites may not attract or generate crimes on their own, yet the prevalence of these sites in a closely knit neighborhood may signal an underlying social ecology which makes an impact on people's perception of reality. The link between these factors and burglaries needs to be further analyzed in future studies. Ethnographic studies using burglar related interview strategies may also provide a clearer picture as to why these factors correlate at the neighborhood level.

Bus stops also correlated with burglary sites, however, when weighted they had the least significance in the present analysis. Burglars use many transportation means and operate in remote neighborhoods (Brantingham & Brantingham, 1984), yet they typically select their neighborhoods and targets among those they are familiar with (Shover, 1996).

The number of bus stops in a cell and the burglary rate may correlate because bus stops are almost everywhere, and secondly; there might be variance among burglars' transportation methods. More experienced professional burglars may use advanced means, or steal a car just to commit a burglary where other inexperienced burglars may use public transportation to explore the opportunities around a neighborhood.

Smalltime drug users need cash, often in small amounts. This was found to be a factor in explaining criminal activity in some other contexts. If that is the case for Bursa, then the burglar's motive and experience can be thought of as a moderating factor for the observed transportation and burglary relationship. In fact, when drug related sites are observed, they indeed seem to be confounded with the burglary event. Although the drug effect on neighborhood crimes is well documented in the literature (e.g. Brown & Bentley, 1998), its application in Turkish neighborhoods is not clear.

The burglary locations seemed to coincide with the hotels risk layer as well. Thus it could be argued that this is not due to the presence of the hotel itself, but the concentration of hotels in certain areas reflect certain characteristics of the social context. Many of these hotels are inexpensive lodges, and they are mostly located in the historical zone of the city, which in the present terminology refers to adjacent type neighborhoods. Hotel zones are locations with transient populations. Often, there is no scarcity of available means of transportation. Night time activities are present in and around hotels, and hotel residents, owners, and neighbors are used to being among outsiders. Social control is weak. The more accessible a target, the more likely it will be broken into. High accessibility locations combined with a lack of guardianship creates a sense of anonymity for offenders. For burglars, it is easier to blend into a neighborhood

where a lot of traffic is present already. They can search for targets, plan entry methods and designate escape routes without being flagged.

Neighborhood Social Context

The fundamental independent variable of the present study was “risk in the neighborhood”. There are social environmental factors that when combined produce risk. In this regard, these social environmental attributes reflect characteristics of risk sub factors. Cumulatively, these were expected to describe risk, which then might be seen as a higher level construct. To be able to demonstrate the relationship between this higher level construct and burglary rates, a factorial analysis was conducted. That is, the social and environmental variables that explain risk as a higher construct were cumulatively analyzed in a single framework.

The composite RTM map produced with the inclusion of these risk factors successfully predicted the high risk burglary locations. Before being included in the RTM analysis, the risk factors were tested statistically. All were found to be significantly correlated with the burglary rates. The risk clusters occurred in certain neighborhoods of the city. As stated by Bernasco (2006), architectural features such as the visibility of the buildings, lighting, and the ease of entry are factors that potential burglars can consider before acting, and in the neighborhoods where lighting and visibility are very low, these are the locations burglars target.

Further, Brantingham and Brantingham (1981) coined the term environmental backcloth when considering the etiology of crime events occurring in the surrounding landscape. This idea refers to the physical characteristics, socio-demographic and cultural

characteristics, and the person environment characteristics (Kennedy, Caplan, & Piza, 2012), and despite their complexity, patterns on this backcloth are easily identifiable. In this present study I coded these neighborhoods in terms of their physical layout.

The results showed that the burglary risk in the context of neighborhood type differed. The distribution of risk clusters among the same type neighborhoods might also differ. That is, some shanty neighborhoods were categorized as high risk areas, while others fell under the low risk category. Even though the physical structure or street network in these neighborhoods was similar, the backcloth concept embodies more than just physical layout. The persons inhabiting this environment, the population on the streets of this environment are an integral part of the "environmental backcloth". During the observation phase, I witnessed this difference. Physically similar neighborhoods signaled different degrees of criminal risk, considering the people in that environment.

Adjacent-type middle class structures:

The adjacent-type of structure is the most common type of classical residency in Bursa, as well as in Turkey, for people with a mid-level income. In this kind of residency, many apartment blocks stand adjacent and each of these apartment blocks has its own style and structure. The number of floors generally ranges from 2 to 5, but this might differ based on the area. The Bursa Municipality plans and provides permission to build residences after considering evidence form related ground and environmental surveys. Adjacent-type buildings are subject to permission provided by the Bursa Municipality and the owner of the construction has to meet certain requirements.

Strolling around neighborhoods with adjacent-type structures, the first thing that catches the eye is the existence of small shops on the ground floor of each building facing the main avenues, which include groceries, barbers, coffeehouses, internet cafes, locksmiths, patisseries and so on. Owners and agents of these small shops may assume the role of "place managers" in terms of their social control influence against crimes and as "capable guardians" as offered by Cohen and Felson (1979). This may be the case if those so-called place managers assume such a role. However, some of these shops (such as coffeehouses, internet cafes, and the like) may pose considerable risks in terms of crime as they are inundated daily with high numbers of unemployed and frustrated youngsters who may have penchant for crime. Unlike traditional European urban environments where social life usually wanes after sunset, most of these shops in adjacent-type neighborhoods remain open until very late hours or even until the morning, leading to a high level of human circulation in such places. It may be that these places manifest themselves as potential "crime attractors."

On the other hand, buildings located on the streets crossing the main avenues usually lack such characteristics, i.e., there are almost no business enterprises within these buildings. Living spaces usually start from the ground floor, up and the upper-levels have balconies from the second floor to the top floor. It is possible therefore to say that residents of in-street buildings are vulnerable to crime due to the limited "natural surveillance," "weak territorial reinforcement" and "proximity" of their dwellings to the aforementioned crime-attracting small shops. These vulnerabilities are quite similar to those addressed by Bernasco and Luykx (2003) and Felson and Clarke (1998).

A second feature of adjacent-type neighborhoods is that there is almost no open space within them. Being built in the center of the city and around commercial areas, even a smidgeon of land in these neighborhoods is sold for exorbitant prices. This, in turn, leads not only to intensification of buildings in parceled blocks but also to the transformation of most of the potential recreational areas into commercial enterprises. It is quite common to find two or more lines of buildings on every block and there is almost no space for ventilation between them, let alone lots and spots for parking or children's playground. More often than not, buildings are constructed adjacent to each other on the same line and there are only several meters between them and those built in the next line. In such a residential design, facades of buildings on each line face the street while their rear sides face each other. Narrow spaces between these buildings create a network of alleys, which is likely to provide potential criminals with an opportunity to commit burglaries (as well as other crimes) and run away without being bemused by "natural surveillance" or "fear of apprehension." In addition, there exist a few pawnshops in adjacent-type neighborhoods, well-known by offenders, which may facilitate potential burglars in transferring stolen goods into cash in a speedy fashion.

Furthermore, one of the most conspicuous features of adjacent-type neighborhoods is the dynamism of social life. The high density of these populations, the cultural diversity of inhabitants, the existence of a myriad of shops, malls and recreational areas in these neighborhoods create a vibrant environment for the residents; but peripheral populations also gravitate towards this vibrancy. Thus, on a regular day, social mobility in Bursa is centripetal, i.e., there is a flow of population from the periphery to the center where most of the adjacent-type structures are located.

Furthermore, the Municipality of Bursa provides one of the best public transportation systems in Turkey and has been investing more in this in recent years. The expansion of public transportation provides more means of mobility for people living in single-family neighborhoods and multi-family apartment complexes. It is important to note, however, that this also creates a risky situation by easing the access of especially unemployed and impoverished young men from the ghettos to crime attractors in the center. Put differently, the expansion and affordability of public transportation enables such youngsters with criminal proclivities to mingle in and familiarize themselves with crime attracting areas, when they would otherwise have difficulty reaching them.

Multi-family apartment complexes:

The literature in the social sciences focusing on the theory and ethnography of space and place underlines the importance of a distinction between social *production* of space and social *construction* of space. The first term emphasizes the material aspects—"social, economic, ideological, and technological—that result, or seek to result, in the physical creation of the material setting," whereas the latter refers to "the phenomenological and symbolic experience of space" (Low, 2000, p. 127). In a nutshell, this body of literature attests *inter alia* to the existence of various interconnections and the interpenetration of space and culture.

Proceeding from such a line of thinking, many studies have shown that people have a tendency to see a direct link between crimes and their physical environment. This, in fact, seems to be a global phenomenon and Turkey is no exception to this, as evidenced by the emergence of a new trend in Turkey in recent decades, the last decade in particular. The trend has to do with the explosion of multi-family housing complexes

with heightened security throughout the country. The city of Bursa is perhaps one of the cities in which this new trend can be seen most vividly. The researcher has seen many such complexes across the city and lived for about one week in one of them.

For the purposes of nomenclature, it is possible to call this type of residence type a "gated community," given that most of these communities are fortified with walls and gates, protected with security guards in multiple locations and a sense of community is easily felt within them. Residents of these complexes are typically upper middle class or affluent families, but it is possible to find people with moderate economic status in some places. One of the major factors leading to the mushrooming of such complexes seems to be related to people's increased fear of crime within urban environments, for a majority of multi-family complexes are constructed on the outskirts of the city. From this perspective, these complexes exemplify how the cultural mood is being "written" on the landscape. In addition to natural surveillance and access control, the existence of sizable open spaces diminishes the likelihood of burglaries or other crimes occurring in these complexes significantly. Several caveats, however, should be considered here.

First, the percentage of workingwomen in multi-family complexes is noticeably higher than other residential settings, which leads to high numbers of empty apartments during working hours. Second, despite the security personnel and apparatuses that are in place, they are not always perfect in practice. Many persons enter these complexes on a daily basis for delivery, repair, visiting or other purposes. Yet, in many of the complexes, the number of security personnel and the quality of screening is insufficient. What is more, notwithstanding the seeming sense of community, most people do not even know their neighbors on the same floor, let alone those living in neighboring buildings. Last,

but not least, security personnel can themselves create a risk by committing crimes or being accomplices to them.

Shantytowns:

'Shantytowns as hotbeds of crime' is a widespread perception in the world. Such a perception emanates from several factors that exist in these locations including poverty, low levels of education, social disorganization, infrastructure problems, and the composition and complexity of their inhabitants, and so on.

In Turkey, the initial construction of shantytowns coincided with the first migration wave in the 1960s from undeveloped parts of the country to the booming cities in the west and south. In other words, the first migration took place as a result of 'economic' factors. Several ethnographic studies (e.g. Karpat, 2003; Kıray, 1998) have been conducted to understand the rural-urban migration characteristics that occurred during the 1960s, when Turkey witnessed a huge industrialization movement. Thousands of people left their villages, sought jobs as workers in textile factories and iron-steel factories. Most newcomers had to settle in shanties of outskirts of the larger cities. For decades, these locations have been known as "gecekondus", and have featured as underdeveloped areas of underpaid people, and are almost the same as those sites characterized by Oscar Lewis in his theory of the culture of poverty (Slattery, 2003).

The second wave of migration came about especially in the 1990s as a result of increased political violence in the eastern parts of the country, caused by the attacks of PKK terrorist organization and, in some cases, the state counter-terrorism responses to this violence (Demir, 2012). The crux of the issue thus had to do with the safety of the

lives of people and their survival strategy was to move towards the industrialized cities in the west and south such as Istanbul, Izmir, Bursa, Antalya, Gaziantep and Mersin.

Migration led to the ghettoization of these cities where internal migrants built shanty houses with the help of their relatives or fellow townsmen who had arrived there before them. In fact, the complexity and difficulty of urban life made it almost compulsory for these migrants to rely on people who were already familiar with the shanty house system. It thus appears plausible to suggest that a bond was automatically created among them, largely due to their sharing of a similar destiny. Put differently, shanties provided these people with a new identity, to which they could hold onto despite extremely difficult circumstances of the city life.

This new identity helped them psychologically, but most of these people have had difficulty in adjusting to the city and finding job opportunities, mainly because of a lack of personal, social and material resources (Kıray, 1998). But still, many people in shantytowns tried to make a living by working in the closest places in the city center that offer various, although they took up low-paying, job opportunities. Overtime, their presence and social interactions became more visible within city centers, which led to the creation of social tension between them and the city dwellers. This tension was exacerbated, especially in the last decade, with the rapid expansion of gated communities by city dwellers at the peripheries of the city, which increased their proximity to shanties. Some thinkers sought cultural explanations to make sense of the said tension. Mardin (1990), for instance, looked at the importance of 'peasant' culture of the migrants and argued that the history of migration in Turkey marked the "peasantization of the urban" rather than "urbanization of the peasant."

There are countless political ramifications of the aforementioned tension, which are beyond the scope of this dissertation. But the historical discord between people living in shanties and urban dwellers still have some lingering effects in terms of people's perception of shantytowns and life within them. Shantytowns are perceived to be a breeding place for various crimes and as exporters of criminals. In Bursa, some of these shanties are associated with terrorism and their residents are thought to be either supporters or sympathizers of various terrorist groups such as, the PKK (a Kurdish Separatist group) and a few leftist-revolutionary groups. There are others that are thought to be the loci of drug related crimes, while some have become notorious as sites where burglaries and robberies are carried out readily.

The shantytown where the researcher mostly focused fell into the last category mentioned above, i.e., it was notorious for perpetrating burglaries and mostly for carrying out robberies. The increasing population in these areas is marked by destitute of socio-economic opportunities. It is a mundane occurrence to see unemployed young men wandering around streets, chatting on the street corners or playing cards in coffee-houses. On the other hand, the physical landscape is quite aversive in general, given that most shantytowns were built illegally and have only recently acquired government services. A crucial ramification of the lack of government services in general, and the absence of any local effective law enforcement, was that people started to believe that "crimes go unpunished" in the shanties. This perception has started to change recently with the provision of government services and the establishment of local police organizations.

In terms of infrastructure, however, provision of government services does not seem to have made notable changes, given that worn-out roads, potholes, run-down

public buildings and parks do not escape your attention as a newcomer or visitor. Moreover, there is almost no pattern in terms of the type of residences. Buildings on the main avenue are usually multi-storey, ranging from two to five floors, and they give some sense of tidiness to the place; but a majority of residents live in makeshift, unfinished brick houses on labyrinthine backstreets that are usually single-floor, without painted facades and roofs. Walking around these labyrinths after dusk at night is quite frightening because most parts are poorly illuminated.

All of the factors enumerated above pose potential risks for residential burglaries. However, there are several reasons that may make us believe that these risks may be negligible in terms of burglaries within shantytowns, although they may create significant risks for other neighborhoods established nearby. First, despite the vulnerable material and symbolic infrastructure that provides potential burglars with ample opportunities, the risks may not be worth taking because the poverty of the shanties does not promise lucrative economic returns. A similar view is discussed by Gunal and Sahinalp (2009) in their studies using a spatial analysis of theft crimes in the City of Sanliurfa (located in the southeast of Turkey). These researchers argued that although burglary offenders usually live in shantytowns in Sanliurfa, these are not attractive targets for potential burglars. Second, shanties are loci of close-knit social networks where individuals usually know one another and participate in multifarious social relationships such as festivals, feasts, weddings and other kinds of ritualistic practices. Any potential delinquent action by individuals is thus conditioned by the notion of “familiarity”, as well as the possibility sense of humiliation or social pressure in the case of being caught.

Third, as mentioned earlier, fear of urban crime has led to the emergence of a new trend that has marked the rapid growth of multiple-family complexes constructed on the outskirts of cities. In many places, however, this trend has resulted in a juxtaposition of these 'gated communities' with shantytowns. In this regard, it is possible to say that the construction of gated communities runs counter to people's expected outcomes from such action because, even though escaping from the urban and establishing gated communities give people some sense of safety and security, it has increased the crime risks that are likely to come from shantytowns with which they are now neighbors. Given that residents of gated communities are composed of mostly affluent families, the aforementioned closing-up of gated communities and shantytowns betokens increased crime risks for the former, risks for burglary in particular.

Single-family houses and villas:

Motivations for the building of single-family houses are similar to those for the establishment of multi-family apartment complexes. The desire of "flight" from the urban for various reasons appears to be the common denominator for them. However, while *security* seems to be the primary concern for the residents of multi-family complexes, the need for *privacy* appears to be the key contributor for people to build single-family houses on the city peripheries. This need for privacy emanates largely from the rapid urbanization of Turkey over the last three decades, which has brought about a host of conflicts and tensions between the locals and incomers. This was reflected also in Bursa as some sections of the city became suitable and famous for construction of single-family houses. During the fieldwork, the researcher visited all of these places and lived in one for five days, which yielded the following observations.

Although the category ‘single-family houses’ was chosen as one of the above-mentioned quadripartite typology, single-family houses are not homogenous in terms of both material and symbolic structures. There are roughly three types of single-family houses in Bursa. The first types are those that were built by locals long time ago, mainly in the 1960s and 1970s and stand sporadically in certain enclaves. Residents of these houses are usually poor; that is why most of these houses share a slum-like outlook. Residents live there permanently and most of them subsist on horticulture by producing fruits and vegetables in their gardens.

The second types were built by people that come from the middle-strata of the society. Most of these people have houses within the city, but these second houses manifest themselves as style-minded sojourn for them for weekends and holidays. Although these types are constructed apart from each other, they are close enough to give an image of a cluster, allowing the residents to find a combination of privacy, tranquility and sense of community that they cannot find within the city. Many of them have hobby-gardens and, architecturally, most of them are stylish, and protected with walls and security systems.

The third type of single-family houses are those built by affluent families, i.e., villas, in places that are known for their natural beauty. Some people live in stand-alone villas, but villa-complexes are more popular, and they look a lot like multi-family complexes in terms of sharing the features of a gated community. That is, villa-complexes are usually fortified with walls and sometimes barbwires on the walls and they are protected with cameras, alarm systems and security guards. Most of the residents live in villas permanently but they commute to the city for work every day. As Weisel (2002)

asserted, occupancy is a risk factor single-family houses where houses are vacant for extended periods, during the day, and usually without any protection of a capable guardianship. The risks for burglary associated with villas are also quite similar to those in multi-family complexes.

Summary

Social disorganization theory was first introduced in the North American context. One would rightfully question if the same measures of "social disorganization" are equally relevant across different social contexts? Similarly, the environmental criminology approach has mostly tested in Western settings. It seems worthwhile to try to understand if environmental measures are indicative of crime risk in other contexts. Although there are prior studies that have found these theoretical approaches explaining social problems in Turkish setting (Basibuyuk, 2008; Duru, 2010; Irmak, 2011), a specific discussion of neighborhood social context and residential burglary risk is nonexistent. Therefore, above all the statistical tests and explanations presented in the prior chapters of this dissertation, observations of the different neighborhoods were extended in this section. As proposed, single family housing neighborhoods had the lowest risk of residential burglaries. The indicators of risk and the social environmental context of four neighborhood types were discussed.

CHAPTER 6: IMPLICATIONS AND CONCLUSION

This chapter presents policy and research implications derived from the findings of this study. It discusses the value of the research outcome, inquires about the opportunities for future research, and presents avenues for policy makers.

Policy Implications

Neighbourhood crime can be studied both at a micro level (household) and at a macro level (neighborhood). Various analytical strategies and tools have been adapted for this type of research. This present study supports the notion that to better understand crimes as a phenomenon of neighborhoods, a multi-dimensional perspective should be sought. There is no simple explanation or solution that can predict crimes and their environmental relationships. In the organization management literature, this issue is described under contingency theory discussions. However, there is no optimal method for designing organizational structures. The best way of organizing a company, a project, a policy, is, however, contingent upon the internal and external factors that come into play.

Some key premises of the contingency theory can provide further insight into studies of crimes in neighborhoods. Rooted in the open systems theory of organizations, contingency theory emphasizes the influence of environmental and situational factors on organizations. Accordingly, there is no one best way to organize and any way of organizing is not equally effective (Scott, 1981). In addressing neighborhood crimes, one should take into account that each environment has its own characteristics and solution to the problem depend highly on the nature of the environment. Furthermore, as shown in this study, environmental factors to explain residential burglary rates are quite

complex and intertwined. Therefore, it is crucial that relationships and the interplay among these factors be analyzed comprehensively in order to develop effective policies.

Crime disrupts social life, and negatively affects the quality of life. It is inevitable that preventing crime elevates the public agenda. Policy makers and practitioners ought to explore new methods and techniques to better understand crime patterns. More conventional and widely incorporated methods like hot spot mapping can be enhanced, if not outmatched by the inclusion of innovative solutions.

Harries defined a hot spot as "a condition indicating some form of clustering in a spatial distribution." (Harries, 1999). Sherman, on the other hand, qualified the definition by saying "a hot spot is small place in which the occurrence of crime is so frequent that it is highly predictable, at least over a one year period' (Sherman, 1995). However, "The Risk Terrain Modeling (RTM) is a risk assessment approach that standardizes all risk factors to common geographic units over a continuous surface". RTM is a way of looking at criminality as "less determined by previous events and more a function of a dynamic interaction between social, physical and behavioral factors that occurs at places" (Kennedy et. al, 2011, p. 343).

RTM has the ability to weigh the significance of different factors at different geographic points in enabling crime events to occur. By using risk clusters, one can forecast future crime and direct interventions to these high risk locations. Unlike hot spots, this forecasting approach permits one to make these predications not because crimes occurred have there in the past, but because the environmental conditions are right for crimes to occur there tomorrow. Hot spots do not "maximize the ability of police to

succeed because they only focus on where crimes are or have been occurring, not where they could occur" (Kennedy, 2010, p. 358).

Based on the prior mentioned reasoning, using risk clusters as opposed to hot spots is most likely to be more effective for police decision making. One benefit of using risk clusters is that they do not "put themselves out-of-business" like hot spot mapping, since the latter only focuses on crimes that occurred in the past, and if police use hot spot mapping correctly, then eventually there will no prior crime to use as a reference point (Caplan et.al, 2011). Additionally, police can be more prepared for any displacement or disbursement to other high-risk areas that might result from their targeted interventions when focusing on crime risk clusters.

Secondly, risk terrain maps yield a higher proportion of correct predictions of crime compared to hot spot maps. Research has shown that this number can be as high as a 36 percent increase in correct predictions when using risk terrain maps (Kennedy et. al, 2011). This allows police agencies to allocate their "resources to areas with high crimes in order to suppress them, and also to areas that pose the highest risk for crimes to occur in the future" (Kennedy, 2011, p. 357). The risk clustering approach increases the success in reducing and preventing crime by allowing police strategists to categorize the most risky areas and anticipate crime problems early. Consequently, police can think proactively and take preemptive action.

According to Caplan, police could "assign resources accordingly to address one or more of the risk factors in the risk cluster spots while they focus suppression tactics at the past crime hot spots" (Caplan et. al, 2011). For example, in the Township of Irvington, 50 percent of shootings occur in only about 15 percent of the entire area (2.8 square miles).

Only a fraction of police resources would be needed to patrol these places, which could address nearly half of the shootings (Caplan et.al., 2011). In conclusion, to foster strategic decision-making and tactical action for crime prevention, risk terrain maps can be a useful tool by showing where environmental conditions are ideal for events to occur in the future.

The use of an environmental risk assessment combined with the spatial crime distribution analysis yields a good model of prediction. As Kennedy, Caplan, and Piza (2012, p. 54) suggested, "crimes tend to occur at places with higher environmental risk, especially if crimes occurred there already".

Increased law enforcement efforts are not sufficient alone to combat residential burglary incidents. Contextually, Caplan et.al, (2011) argued that "some places are likely to be more crime prone than others— regardless of any police interventions." This fact points to the occurrence of residential burglaries that can be associated with different types of neighborhoods- or social structural contexts. Therefore, problem solving approaches in which the likely impacts of neighborhood social structures are carefully analyzed could play a significant role in preventing residential burglaries.

The temporal and spatial interpretation of a crime in a specific social area is necessary for a successful intervention. An intervention's success may depend on convincing policy makers and managers before implementing a macro-level prevention program. Carefully designed RTM maps are suitable for the daunting task of visually interpreting a complex environmental backcloth. This doctoral dissertation suggests that police agencies, local policy makers, and city planners should consider using innovative models like risk terrain modeling for deriving more strategic decisions about prevention of residential burglary. In doing so, understanding residential burglary events through

assessments based on environmental risk values will lead to emerging policies to address the problem with better solutions.

In sum, a major contribution of this work is the data showing the importance and influence of place for this effect. These findings provide policy makers and police agencies with practical solutions for policing risky places. The least they could do is to allocate resources where they are most needed.

Research Implications

Implications for future research are discussed here in two parts. Suggestions for studies on the ecology of crime, specifically burglaries, using geo-coded data and spatial and temporal analysis are included in the first section. Opportunities for crime or the risk of victimization can rarely be zero at any place. Crimes can occur anywhere. Kennedy et al. (2012) offer an example of a person who is robbed on a street, and suggest that if that person is delayed for any reason, a robbery could still occur at some other address on that very street. That is why designing an analytic approach to understanding the continuous surface for criminal opportunity is important. That is, the strength of RTM. However, it is not always likely that the opportunity for residential burglaries in the same apartment building are equal. Offenders may consider micro factors for break ins, and that creates varying levels of risk even in the same geographical location. Environmental research studies at all levels, micro and macro, are thus needed for purposes of further understanding residential burglary events (e.g. such as the role of resident types, types of entries, doors, building styles). Studies incorporating the micro level opportunity constructs of households will also add a valuable dimension to crime place understandings, through the application of city to raster grid cells.

Furthermore, in order to study macro and micro level studies, any researcher would need data to conduct a spatial and temporal analysis. These types of data are becoming more popular in police departments as well as municipalities, and other state statistics institutions in recent years.

The second part of the research implications can be applied to Turkey. First, analytical studies on the ecology of crime, especially on burglaries, in Turkey are still in their infancy. Except for a few macro level investigations that have studied all types of larcenies (e.g. Gunal & Sahinalp, 2009; Karakas, 2004), at least known by the researcher of this dissertation, there is almost no study analyzing micro level risk factors of residential burglaries. Moreover, except for Duru (2010), no study has analyzed the correlates of residential burglaries (such as attractiveness) at various levels in Turkey. In other words, these areas remain untouched, and this may be one area where future research opportunities are present.

Second, other than quantitative studies on the ecology of crime, future research might be interested in using ethnographic methods in understanding a burglar's motivations and *modus operandi*. This is also an understudied area and the burglary literature necessitates such inquiries conducted in different social settings as well. Research based on social disorganization and environmental criminology has been conducted in different settings. As such, ethnographic studies conducted with the participation of active criminals should be replicated. In Turkey, for instance, data acquired from the burglars' point of view can enrich our understanding of how offenders think, and can provide insight on target selection and offending.

By filling such gaps in the residential burglary literature, this dissertation can enable further progress toward scientific realism in criminal justice. It is hoped this dissertation will serve to add a new methodological perspective to the knowledge pool in which scholars try to find "transferable lessons" for preventing residential burglary in different neighborhood context.

Conclusion

This doctoral dissertation aimed to understand the neighborhood level social environmental characteristics and their effects on creating residential burglary risk in an urban environment in Turkey. In doing so, it followed Risk Terrain Modeling principles and compared its predictive power to hot spot analysis (bearing in mind the extent of the availability of the data), in order to designate high and low risk burglary sites or places and to observe the variance of burglary risk through examining structurally different neighborhoods in the study area. A multi-method study was duly conducted, and available police crime data were used for the bivariate and multivariate neighborhood level analyses that were conducted. Feature environmental data were obtained, and the key variables were treated as risk factors for the RTM and hot spot analyses. The neighborhoods were examined and labeled in terms of one of four categories: shantytowns, single family, adjacent type, and multifamily apartment complexes. The burglary risk in these neighborhoods was regressed on neighborhood type, and the type of neighborhood was found to be an explanatory for neighborhood level criminogenic risk. Finally, this study discussed the role of a neighborhood's social characteristics in influencing burglary events by adding qualitative data from police 'ride alongs' and systematic field observations.

It is concluded that effective policing should not only deal with crime clearance issues, but should require police to have knowledge of why and how these issues occur, because this can evolve into a more satisfactory prediction valued approach. The public demands police focus on crime prevention. Apparently, prevention relies on prediction. Public policy informers will always be one-step ahead when armed with the knowledge of where the next criminal wave will hit. Environmental crime studies have helped practitioners to understand the importance of place and its characteristics in creating conditions conducive to crime. Researchers may help even more by producing actionable information on criminal opportunity and how this relates to the risk of crime.

This dissertation provides significant findings that can serve urban city planners' who must make future decisions regarding environmental risk factors, which play a fundamental role in exploring the occurrence of residential burglary in any landscape. Therefore, the research presented here proves the risk terrain model can be a useful predictive tool in different settings. The identification of high risk locations that were prone to crime incidents was analyzed by using RTM. Police departments and those who seek to employ effective technology, and value the input of scientific knowledge, might benefit from the use of similar risk analysis tools and risk measurement tools to those used in the present study as an analytical approach.

This study also distinguished Bursa neighborhoods into different types for the first time, with regards to their physical layout, and this categorization is shown to be explanatory when combined with the identification of local environmental risk factors. Some environmental characteristics of these neighborhoods may be culturally specific. Therefore, the contextual differences in these social areas need to be explored further.

Findings of this research may allow the local and national policy makers and police agencies to act in a proactive way rather than being reactive, and this may provide for a more efficient allocation of strategic crime prevention resources to prevent residential burglaries in the future.

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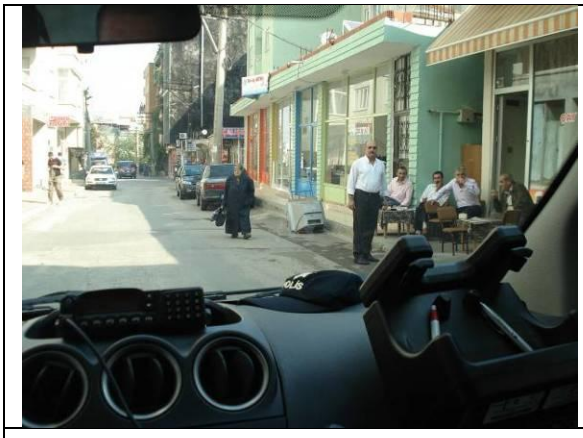
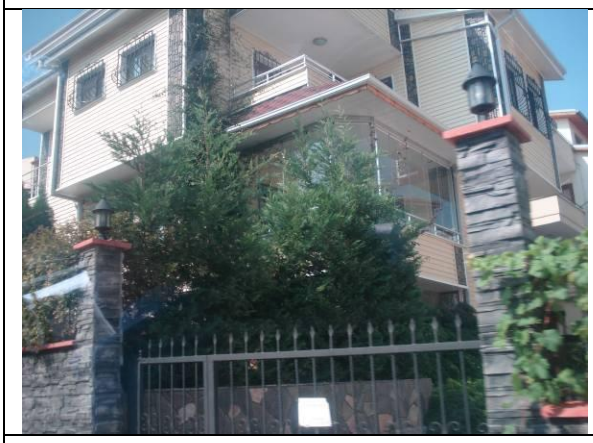
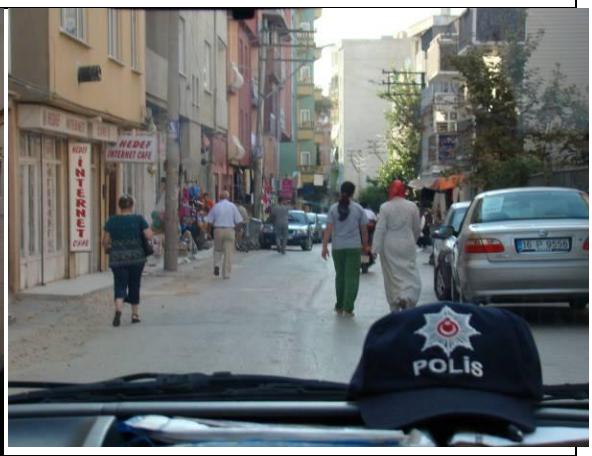
APPENDICES

APPENDIX A Street Views from Bursa



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