

IDENTIFICATION OF FACTORS INFLUENCING THE COMMISSION OF BURGLARIES

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## **ABSTRACT**

As in many countries, burglary is a very serious crime in Turkey. Scientific methods and techniques are needed to solve complex burglary cases. This study is completed in the Bursa Police context since they classified many crime data conducive to scientific studies under a project called BEMTAP. The main purpose of this study is to examine the factors influencing the commission of burglaries, using an epid-criminological perspective.

It can be argued that factors leading to the commission of a crime are important for formulating preventive strategies in the community. In this study, the contributing factors are categorized into three main groups of predictors, by adapting a disease triangle in epidemiology: opportunity factors (agent), offender factors (host), and environmental factors. Criminal method (technique) and time of burglary are conceived as the opportunity factors. Four personal or host characteristics of offender factors are age, gender, marital status, and education level. Distance between the home addresses of burglars and target houses and distance between target houses and police stations are examined as environmental factors. This epid-criminology perspective is thought as a basic framework for integrating two theories: routine activity theory and rational choice theory. Two hypotheses, using agent, host, and environmental factors as predictors, were proposed to test their relationships with the frequency of burglaries committed and with the likelihood of committing repeated burglaries.

In measuring the relative influence of the predictor variables on the number of burglaries and on repeated burglaries, two different models were constructed and validated. For the first model of predictors of crime against property (burglary), Hierarchical Multiple Regression Analysis was performed. For the second model, a logistic model of the predictors of repeated

burglaries was used and analyzed. The results show that offender factors are more influential than opportunity and environmental factors in explaining the variability in frequency of burglaries committed and the likelihood to commit repeated burglaries.

In conclusion, the best way to reduce burglary rate is to focus on offender factors. Dealing with opportunity factors and environmental factors would also contribute to a decreased burglary rate.

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## **LIST OF ACRONYMS/ABBREVIATIONS**

BEMTAP	(Bursa Emniyet Mudurlugu Teknolojik Adaptasyon Projesi) (Bursa Police Department Technological Adaptation Project)
CCTV	Closed-Circuit Television
DNA	Deoxyribonucleic acid
EGM	Emniyet Genel Mudurlugu (General Directorate of Security)
ID cards	Identity Cards
IRIS	Intensive Recidivist Intervention Scheme
TUIK	Turkiye Istatistik Kurumu (Turkish Statistical Institute)
UCR	Uniform Crime Report

## **CHAPTER.1.INTRODUCTION**

Burglars who enter to the villa of Selahattin Ayan, a tycoon who owns the chain of Patisserie Pelit, have stolen 10 million dollars worth of jewelry and currency in 2003. He was not at home while burglars stole his money and valuable goods because his blood pressure was elevated, and he went to a pharmacy without locking the door of the villa. There were no fingerprints in the villa, but some witnesses said that one of the burglars was a woman. Even now, after a long hiatus of the event, the perpetrators have not been found and arrested. It is speculated that Hasan Ozdemir, Istanbul Police Chief at that time, has since dismissed his Theft Bureau which has a total of 41 personnel, and assigned them to less important units only because they could not catch and arrest the burglars (Tore, 2004).

The importance of this case is not related to the assets stolen at one time; rather, a desperate police chief has dismissed 41 personnel only because officers could not arrest burglars. Whereas the Turkish National Police could not be respected as successful in the fight against burglary, those police personnel who were transferred to the other units were victims of the politic populism. That Theft Bureau had no clues other than by gathering evidence obtained through a Crime Scene Investigation Unit, which pushed the Bureau to use new methods and techniques to solve more complex and important cases. In fact, burglars in general leave little or no track behind them after they finish their jobs (Briody & Prenzler, 2005). Scientific methods and techniques are needed to solve complex criminal cases in the future. Understanding the general trends of burglary and taking measures accordingly should be a high priority for the Turkish National Police Organization.

In this study, factors that influence burglary problems in Bursa City were examined. The data for the study were compiled by Bursa Police Department of Public Security and Department of Juvenile Crime. The Department of Public Security in Bursa classified crime data conducive to scientific studies under a project called BEMTAP (Bursa Emniyet Mudurlugu Teknolojik Adaptasyon Projesi). In this project, Bursa Police recorded information about all of the events, suspects and victims between 1993 and 2009 (the work continues at the time of this writing). Thanks to the assistance of the project and huge efforts of city police, nearly 20,000 suspects were arrested and have been delivered to the judicial authorities so far (Bursa Emniyet Mudurlugu, 2010).

### **1.1. Statement of the Problem**

Compared to other crimes, especially violent crimes, burglary does not draw the attention of the people and public officials as much. However, its prevalence and economic burden are more than estimated. According to data from the National Crime Victimization Survey (2010), in the USA between 2003 and 2007 there were 3.7 million household burglary cases on average annually. In 27.6% of those events, at least one of the household members was at home and 7.2% of those household members experienced violent victimization (44.3% of those victims were injured by the burglars). Burglars stole \$1000 (cash, or goods equal in monetary value) or more in nearly one of three burglary cases (U.S. Department of Justice, 2010). The Uniform Crime Report (UCR) revealed that 2,199,125 burglaries were recorded in the United States in 2009 and most of them (72.6%) were residential burglaries. In those burglaries, American people lost nearly \$4.6 billion in total and \$2,096 per victim (Federal Bureau of Investigation, 2010a). Other

data retrieved from the British Crime Survey indicated that of the nearly 9.6 million crimes that were committed in England and Wales in 2009, 7% of them were burglary. According to the official police records, 4.3 million crimes were committed in the same area and in the same period and 12% of them were burglary. In 2009, 2.8% of all people in that area were burglary victims and among those burglaries, nearly half of them were resident (dwelling) burglaries. The same study indicated that 15% of the people thought that they were very likely to be a burglary victim in the next year (Flatley, Kershaw, Smith, Chaplin & Moon, 2010).

On the other hand, it is argued that all of the burglaries were not reported to the police, and the real seriousness of the crime is underestimated by official data. As an example, there is a huge inconsistency between the National Crime Victimization Survey results and the Uniform Crime Report, which is compiled by the Federal Bureau of Investigation with regard to the number of burglaries in the United States. The National Crime Victimization Survey revealed that only 55.5% of burglary crimes were reported to the police. The main reasons for this low rate of reporting were that people believed that some burglaries were not so important as to report to the police, others believed that police could not help due to lack of proof, or police would not help because it was too late to investigate (U.S. Department of Justice, 2010). The British Crime Survey revealed that the percentage of those who reported a burglary to the police was very high (84%) if there was an economic loss, but low if there was no economic loss (56%) in England and Wales. In addition to lack of economic loss, other factors for non-reporting include believing that police would not or could not do anything, victims trying to deal with the problem by themselves, believing it was not worth reporting (low rate of loss), reporting to other

authorities, it becoming a common occurrence, having fear of reprisal, and having had previous bad experiences with courts or police (Flatley et al., 2010).

In recent years, burglary in Turkey has become as critical as elsewhere in the world. The number of burglaries had steadily increased until 2006, when it reached its highest level with 89,234 burglaries. After 2006, it began to decrease as it did in all Europe (Eurostat, 2010). The burglary rate per 100,000 people is 154.5 in Turkey, while it is 166.8 in the rest of the western Asian region where Turkey resides. The average rate per 100,000 people is 392.6 for the world (only 55 countries which have burglary records were included), (United Nations Office on Drugs and Crime, 2010). However, it is possible to say that there is a decline in the burglary rate worldwide in general (Table 1). Titus (1999) explained the drop in the burglary rate in the United States due to the prevalent usage of personal security devices such as alarm systems, the robust economy in the 1990s, and that robbery is preferred by cocaine users instead of burglary.

**Table 1 Trend in Burglary in the World (N=25)**

	1996	2001	2006
Median	676	619	458
Trend	100	91	68

Reference: United Nations Office on Drugs and Crime. (2010).

Official data from the Directorate General of Security in Turkey indicated that 351,949 thefts took place in Turkey in 2006 and 85,964 of those thefts (24.4%) were burglary. Burglaries account for nearly 11% of all crimes which are committed in the same period (Emniyet Genel

Mudurlugu, 2007). The number of convicts in prison because of thefts in 2006 was 6,603 in Turkey and 223 of them were in Bursa city (Turkish Statistical Institution, 2010). Burglary is an important crime not only for the city of Bursa but also other cities as well. A scientific study is needed to analyze burglary crime and the results of the study can be useful for various police departments in Turkey.

## **1.2. Definition of Terms**

**Burglary:** Burglary is defined as “Breaking and entering the dwelling house of another, in the nighttime, with intent to commit a felony therein, whether the felonious purpose be accomplished or not” in Webster Online Dictionary (2010, para. 1). The term ‘Breaking’ is used to specify that burglars should create an opening or a breach in order to disable security measures at a house or workplace. A time period (night) is mentioned simply because households can be left defenseless at that time (Shover, 1991).

In Uniform Crime Reporting, which is compiled by Federal Bureau of Investigation, burglary is classified under property crimes along with larceny-theft, arson, and motor-vehicle theft and defined as “the unlawful entry of a structure to commit a felony or theft.” In order to call an action as burglary, use of force is not a requisite. As the definition suggests, three elements are crucial in order to call an action as burglary. First, an unlawful entry or trespassing should have occurred. Second, the unlawful entry should take place in the limits of a structure. While ‘structure’ can be perceived as an apartment, houseboat, house trailer, barn, and house, it can be interpreted as an office, stable, railroad car, and vessel if they are used as a permanent

dwelling. Third, the unlawful entry into a structure should aim at committing a felony or theft (Federal Bureau of Investigation, 2010b, para. 1).

The United Nations Office on Drugs and Crime defined the term as “gaining unauthorized access to a part of building/dwelling or other premises; including by use of force; with the intent to steal goods (breaking and entering).” Burglary should include, where possible, theft from a house, apartment or other dwelling place, factory, shop or office, from a military establishment, or by using false keys. It should exclude theft from a car, from a container, from a vending machine, from a parking meter, and from a fenced meadow/compound. (UN-CTS M4.6) (United Nations Office on Drugs and Crime, 2010, para. 1).

Burglary is not a separate crime from theft in Turkish Criminal Justice System and burglars are judged according to Turkish penal Code Article numbers 141, 142(g), and 143 under theft crimes. Theft is defined as getting a movable property without consent of the owner in order to provide a benefit to him or anyone else. In the case of committing theft, crime in the housing places (Article 142-g) and in nighttime (Article 143) are mentioned as aggravating factors (Turkish Penal Code, 2004). As a general definition in the Turkish literature, burglary is “gaining access to private premises by the use of force with the objective of stealing goods” and it includes “theft from an attic, basement in a multi-dwelling building and theft from a secondary residence (even if unoccupied)” (European Sourcebook, 2010, para. 22).

**Environmental Factors:** Environmental factors are factors that exist in a living area of a person and affect his or her behavior one way or another (Glanz, Lewis & Rimer, 1997). In this

dissertation, distance between target houses and home addresses of burglars and distance between target houses and the nearest police stations are categorized as environmental factors.

**Epid-Criminology:** Epidemiological Criminology is defined as

[T]he explicit merging of epidemiological and criminal justice theory, methods and practice. Consequently, it draws from both criminology and public health for its epistemological foundation. As such, EpiCrim involves the study of anything that affects the health of a society, be it: crime, flu epidemics, global warming, human trafficking, substance abuse, terrorism or HIV/AIDS. (Lanier, 2010, p. 72)

**Offender or Host Factors:** Offender factors are personal characteristics of people which are assumed to have contributed to criminality. Some of the offender factors are age, gender, ethnicity, social status, educational level, occupation, and marital status. As an example, Weatherburn focused on five offender factors while explaining “the relationship between economic adversity and crime”: family size, family type, age, social mobility, and ethnicity (1992, p.4). In this dissertation, age, gender, marital status, and education level are categorized as offender factors.

**Opportunity or Agent Factors:** Opportunity, in terms of burglary crime, is a concept which is used to determine the attractiveness of any target, the benefits of successful completion of a burglary, and if the target has adequate surveillance or not (Morgan, 2001). In this dissertation, burglary time and techniques that are used to enter a target house are categorized as opportunity factors.

**Repeat offender (burglar):** Some researchers categorize burglars into three groups by taking into account their ability: professional, middle-range, and novice. Professional burglars



are generally older, target regions further from their own houses, select more attractive targets, and sell those stolen goods in well-established outlets. Middle-range burglars work generally alone. Novice burglars are young; they select closer and cheaper targets (Weisel, 2002). In this dissertation, repeat burglary offenders are defined as burglars who commit more than one crime in a certain period.

### **1.3. Context of the Study**

The study called “Identification of factors influencing the commission of burglaries” was investigated in a city police (Bursa Police Department) context only. In Turkey, there is no local police organization; instead, there is only one National Police in the country. However, the results of the study can be generalized to the national level if the results are significant.

In this study, factors that influence the number of burglaries and repeat burglaries were examined. The data subject to the study belong to Bursa Police Department of Public Security and Department of Juvenile Crime. The Department of Public Security classified many crime data conducive to scientific studies under a project called BEMTAP. In this project, Bursa Police recorded information about all of the events, suspects and victims between 1993 and 2009. Thanks to the assistance of the project and huge efforts of city police, nearly 20,000 suspects were arrested so far, and they have been delivered to the judicial authorities (Bursa Emniyet Mudurlugu, 2010).

#### **1.4. Purpose of the Study**

The main purpose of this study is to examine the factors influencing the commission of burglaries. There are too many scientific studies related to burglary in the eastern part of the world, but because of their limitation of time, place, and population, it is hard to benefit from those results in Turkey. In this study, it is expected to find general tendencies of burglars and their main characteristics. If accomplished, it will be easier for city managers and police chiefs to find solutions and produce policies against them. For example, opening and closing police stations in Turkey are not based on a scientific decision. Instead, they decide on a daily basis ideas and popular tendencies. In 1999, 54 of 126 police stations in Istanbul were closed by a decision made by the Istanbul Governor's Office, but 22 of the closed police stations have come into operation again in a very short time. The Istanbul Governor's Office planned to reopen the remaining 32 if it had sufficient staff in the following years (Istanbul Governor's Office, 2006). Studying the deterrence effect of police stations would be useful for Turkish officials while they are in the decision process.

#### **1.5. Research Questions**

Although there are numerous factors that may influence the commission of burglary, little is known about the epidemiology of burglaries in terms of time, place and person. The following questions, guided by this scientific orientation, are investigated in this dissertation:

Q.1. What is the relationship of the frequency of crimes to the Opportunity, Offender and Environmental factors?

Q.2. Can repeated offence against property (burglary) be explained by the Opportunity, Offender, and Environmental factors?

### **1.6. Significance of the Study**

In recent years, with the motivation of increasing security concerns especially in urban areas (Tang & Parish, 2000), many households began to take personal precautions against burglary such as installing steel doors and mounting security cameras around the houses (Zhang, Messner & Liu, 2007). Beside economic effects, psychological effects of burglaries are another important aspect to consider while discussing the issue. In Great Britain, 40% of the burglary victims reported that the crime had affected them very much and 68% of the burglary victims felt very angry. The most common psychological consequences of burglary are fear, shock, and having difficulty to sleep (Budd, 1999). Given its traumatic effects upon victims, their families and neighborhood, it can be easily inferred that the governments should take immediate precautions against burglary and burglars (Warren, Hogard, & Ellis, 2007). In order to produce policies related to burglary crime, scientific studies are needed. While there are many studies related to burglary crime in Europe and the USA, there are very few studies in Turkey. Another problem is that burglary is not defined as a separate crime from theft in Turkish Penal Code. In the light of scientific studies, the importance of burglary will be understood clearly and precautions can be taken against it. This study will fill an important gap in literature by analyzing real data in Bursa.

On the other hand, relative importance of factors that influence burglary crime was not studied by scholars so far. This study focuses on determining relative importance of three factors

(opportunity, offender, and environmental factors) that influence a specific crime: burglary. Determining the most influential factors will help public managers to use public sources accordingly.

### **1.7. Chapter Summary**

As in many countries, burglary is a very important crime in Turkey. Scientific methods and techniques are needed to solve complex burglary cases. This study is completed in the Bursa Police context since they classified many crime data conducive to scientific studies under a project called BEMTAP. The main purpose of this study is to examine the factors influencing the commission of burglaries. There are too many scientific studies related to burglary in the eastern part of the world, but because of their limitation of time, place, and population, it is hard to benefit from those results in Turkey. In this study, it is expected to find general tendencies of burglars and their main characteristics while they choose targets.

## **CHAPTER.2.LITERATURE REVIEW**

### **2.1. Past Studies on Burglary and Repeat Burglary**

Criminologists studied many aspects of burglary, as in other crimes. While some scholars focused on victim-oriented subjects such as hot spots, burglary victims, stolen goods, risk factors of being a burglary victim, others studied offender-oriented subjects such as burglary offenders, repeat offenders, burglars' decision-making processes, factors that influence committing a burglary crime, and group offending.

Burglary, like other types of crimes, is not randomly distributed over time and space in any society. While some places experienced few burglaries, there may be some hot spots in the other parts of a city. There are certain times when burglary cases take place relatively frequently. Law enforcement agencies, criminologists, and city managers spend much time analyzing crime in order to produce the right solutions. While some scholars studied socioeconomic factors such as ethnicity, poverty, and income (Byrne & Sampson, 1986), others focused on environmental factors such as lighting, appearance of the city, and land uses (Newman, 1972).

Mawby (2001) claimed that the main factors affecting the risk of being the target of burglary can be placed into four main categories: household and premise characteristics, planning and design characteristics of the neighborhoods and houses, surrounding area of a house or neighborhood and other characteristics such as lifestyle of the victims. He also argued that burglars take four factors into considerations while they commit a crime: guardianship of the victim and house, proximity of the target to their home addresses or public offices such as police

stations, the worth of the targets, and target exposure. Among those factors, the most important one was guardianship, according to Mawby.

Home Office Statistical Bulletin, published four times a year, reveals both the latest police records and survey results in order to show recent crime statistics and crime trends in Great Britain. A group of scholars who work with staff in the Home Office Statistics Unit of the Science and Research Group used logistic regression method to estimate the possibility and variation of burglary victimization depending on characteristics of the variables. They found that structure of household, home security level, and area type explain most of the variations of risk of burglary in England and Wales. Accordingly, given the household structure, lone households have the highest risk for burglary crime (Flatley et al., 2010).

The target homes in burglary cases generally belong to low-income people contrary to the popular belief. Even the possibility of victimization is inversely correlated with income of home owners: The more the household income, the less probability of becoming a burglary victim. This is valid for when both household members are present and not present during the burglary. On the other hand, rental properties are two times more vulnerable than owned properties in the United States (U.S. Department of Justice, 2010).

A report which was prepared by both academicians and State officials in England revealed the risk of burglary by household type. According to that report, young heads of households, houses which have no preventive measures for burglary, houses located in socially disorganized neighborhoods, and houses where a single-parent lives with children bear the highest victimization risk in terms of burglary. Households that are unemployed, single or

separated, Asians, and those who have no insurance against theft are under median-level risk along with rental houses which are leased less than one year and located in inner cities. Unoccupied or left empty flats or terraced houses for more than five hours and located in the northern region, council estate area, on the main road and houses whose households are Afro-Caribbean, divorced, have no personal car, whose monthly income is under £5000 bear relatively low risk in terms of burglary victimization. In addition to those houses mentioned above, student houses, houses located above shops, close to student hostels, whose households move in or out in a short time, unoccupied caravans and holiday houses are under risk. Houses located near victims of burglary are also suitable targets for burglars. In the case of encountering target hardening measures in a house that is burglarized successfully in the past, burglars will probably select the closest targets in order not to return home empty-handed (Curtin, Tilley, Owen & Pease, 2001).

British Crime Survey results shed light on a lot of unknown aspects of the burglary crime. It has been proven again by British Crime Survey that people bear more risk to be a burglary victim as their annual income decreased. Renters are at 4.5 times more risk than home owners according to the same data. Remaining for a longer duration at the same address decreases the risk of being a burglary victim. Residents who have lived in the same address more than ten years have one third less risk than residents who lived in the same address less than one year. Flats are 1.5 times more vulnerable than houses (such as detached, semi-detached, and terraced). Multicultural areas have the highest level and countryside areas have the lowest level of burglary rates in terms of output area classification. Houses in neighborhoods containing buildings with high levels of structural deterioration are two times more attractive than low level ones. When

households are left unoccupied for more than five hours, they provided enough opportunity for a burglary to occur (Flatley et al., 2010).

It is found that the houses which are burglarized in the past bear four times more risk to be the victim of a burglary in the future than non-burglarized houses in Saskatoon, Canada (Polvi, Looman, Humphries & Pease 1990). In Great Britain, 4% of burglary victims have experienced 44% of all burglaries in a given year (Pease and Laycock, 1996). Fourteen per cent of burglary victims have been victimized more than once (of which eight percent occurred twice and six percent occurred three times) in the past in England and Wales (Flatley et al., 2010). In Australia, 16% of burglary victims have been exposed to 32% of all burglaries. The relatively low level of re-victimization in Australia is explained in that victims tend not to report again since they have no hope that police can find the offenders (Farrell & Pease, 1993). Neighborhoods where the burglary victimization rate is high also have a high-level re-victimization rate (Mawby, 2001). The burglary victims will probably be exposed to the same crime in the following six to eight weeks after the first one (Polvi et al., 1990). The main reason for re-victimization of the houses is attractiveness (easy to enter or full of valuable goods) for burglars who discover the appropriate target and their colleagues who are informed and advised by first time offenders (Polvi et al., 1990). Based on the findings in the past, Pease concluded that "...the best single predictor of burglary victimization was past victimization" (1993, p. 326, 327). The age of the head of household was inversely related with the probability of being burglarized: the older the head of household, the less risk of burglary victimization (Flatley et al., 2010).



The most common stolen goods in a burglary when a household member is not at home are electronics, personal items (such as recreational equipment, luggage, clothing, bicycles and animals), purse, wallet, credit cards, household items (such as machinery, tools, garden products), cash, food, and firearms, respectively, in the United States. Nothing has been stolen in one of four burglary cases when a household member is not present and more than a half when a household member is present at home (U.S. Department of Justice, 2010).

Some researchers categorize burglars into three groups by taking into account their ability: professional, middle-range, and novice. Professional burglars are generally older, move further regions from their own houses, select more attractive targets, and sell those stolen goods in well-established outlets. Middle-range burglars work generally alone. Novice burglars are young; they select closer and cheaper targets. It is easy to deter novice burglars by dogs or alarms (Weisel, 2002). Some scholars claimed that the ages of the offenders are proportional to the distance traveled to commit a crime: the older the offender, the more distance the offender is willing to travel (Wiles and Costello, 2000; Warren, Reboussin, Hazelwood, Cummings, Gibbs, & Trumbetta, 1998). By comparing the years 1966 and 1995, Wiles and Costello argued that young offenders travel further and older offenders travel shorter than in the past to commit a crime (Wiles & Costello, 2000). For burglary, it is argued that younger offenders prefer closer targets compared to the choices of older offenders (Costello & Wiles, 2001).

Weisel mentioned seven important factors that burglars take into consideration while they are deciding to select their targets: home occupancy, accessibility to the house, potential rewards

and punishments, visibility of the houses, convenient location, vulnerability, and acquaintance with the target and neighborhood (Weisel, 2002).

Burglars generally gather information about selected target houses before taking action; they generally work in groups; and they generally sell stolen products to certain buyers (Wright & Decker, 1994). Although there are a lot of differences in the number of crimes committed by burglars (Wright and Decker, 1994), it was found in general that they commit at least two burglaries in a week (Repetto, 1984).

In a study conducted by Mullins and Wright (2003), interviewees who are active burglars at the time of the study explained that they also got involved in robbery, drug selling, assault, and auto thefts in addition to other crimes in different times of their lives. This information is important in terms of the relationship among the crimes which are committed by the same offenders.

Some scholars examined the difference between group offending and lone offending in terms of journey to the crime, but they could not find a noteworthy relation between them (Costello & Wiles, 2001; Van Koppen & Jansen, 1998). In his prominent study, Snook (2004) found that “burglars offending alone travelled slightly less, on average, to select targets than those offending in groups” (p. 61).

## **2.2. Factors That Lead to Committing Crime**

Factors that influence people to commit a crime were always an attractive subject for scholars in the past and they continue to attract attention. According to classical criminological theories, people commit crime because they work for their own interests in the absence of an

effective punishment system. It is a kind of choice between costs and benefits of crime (Beccaria, 1963). Individual trait theorists argue that psychological and biological traits of criminals are different from the standard population, and those different traits along with some other environmental factors were the main causes of criminal behavior (Glueck & Glueck, 1950). Shaw and McKay (1972) blamed disorganized neighborhoods as the main source of crimes since disorganized neighborhoods are not effective in the fight against crime. Differential association theorists emphasized peer effect on crime. According to the scholars, when a crime is not defined as a crime and justified by peer groups, criminal behaviors are done again and again and those behaviors increasingly pervade in the society (Sutherland & Cressey, 1970).

Opportunity factors were first discussed by Anomie theorists in the middle of the 20<sup>th</sup> century. They claimed that when people who are born and raised in disadvantaged neighborhoods have opportunity for the *American Dream* to come true, it leads a structural strain in the society. With the assistance of weak social bonds, crime rates increase quickly (Merton, 1964). Other scholars who study strain suggested that strain is a result of failure to succeed and crime is a response of unsuccessful people in their reaction to strain (Cohen, 1955; Cloward & Ohlin, 1960). Hirschi (1969) focused on both offender and environmental factors to explain criminality. He asserted that internal (e.g., self control) and external factors (e.g., social bonds) prevent people from committing crimes in general. Cornish and Clarke (1986) explained crime as *rationality*. According to them, criminals were rational like the average person and people commit crime if costs outweigh benefits. Cohen and Felson argued that three important elements of crime are supposed to converge at the same time and place: a suitable target, a motivated

offender and lack of guardianship. The absence of any one of them would prevent the crime (Cohen & Felson, 1979).

It was claimed that when people who commit a crime were stigmatized as criminal, they would continue to stabilize their roles in the society (Lemert, 1951, pp. 76–77). Some scholars argued that inequality in the society is one of the main reasons of criminality. Affluent people in a society may use their means to exploit relatively poor people. Since capitalism leads to inequalities in a society naturally, crime is a part of capitalism (Currie, 1997; Greenberg, 1981). Another author mentioned the indirect effect of inequality. According to him, inequality yields injustice and people who suffer from injustice resort to illegal ways like crime (Quinney, 1969). Feminist scholars explained crime by gender factors. They argued that men resort to crime in order to control women in a deviant way (Messerschmidt, 1993; Adler, 1975; Daly & Chesney-Lind, 1988). Developmental and life course theorists insisted that the causes of crime are a process which began before the birth of a child and continues through all his life. Social environment and individual factors determine onset, end, and length of criminal careers (Moffitt, 1993; Sampson & Laub, 1990).

### **2.3. Factors That Lead to Commit a Burglary**

It can be argued that factors that lead to committing a crime are important for burglary, also. In this study, those factors were categorized into three main groups by adapting a disease triangle in Health Science (Schneider, 2011): opportunity factors, offender factors, and environmental factors.

### **2.3.1. Opportunity Factors**

Felson argues that “Opportunity is the root cause of crime” (2002, pp. 35). Opportunity, in terms of burglary crime, is a concept which is used to determine the attractiveness of any target, the benefits of successful completion of burglary relative to any payoff, and if the target has adequate surveillance or not. Why are some targets more attractive than others? Are those goods worth stealing or not? Do the guardians stay around at the time of burglary? All of those questions are related to opportunity factors that influence the decision making of burglars (Morgan, 2001).

According to Anstey, opportunity factors are important factors motivating burglary offenders. It is claimed that in neighborhoods where social cohesion is weak, burglary and other crime rates would necessarily be more than in other, more stable, neighborhoods. The main reason of this consequence is that thanks to close relationships among inhabitants of a neighborhood, there would be a strict surveillance over the streets (Bursik & Grasmick, 1993), and it would deter strangers from committing a crime since it is easy for them to be identified by residents in such neighborhoods (Bennett, 1989). Occupancy is also a very important factor for burglary crime. It is obvious that burglarizing a house that has residents inside is more difficult and risky than unoccupied homes (Poyner, 1983). There is a contradiction about the effects of affluence on attractiveness of the target house. While some scholars argue that poorer neighborhoods and houses are more vulnerable than affluent ones (Brantingham & Brantingham, 1981), others claim the opposite (Waller & Okihiro, 1978). Maguire and Bennett claim that poor and affluent neighborhoods are more attractive to the burglars than middle income neighborhoods (Maguire & Bennett, 1982). Based on that information, Anstey (1998) concluded

that relative location of the affluent neighborhoods and houses make them more attractive for the burglars in general. It is also claimed that land use factors and types of cityscape are some of the determinants of vulnerability of the houses (Harries, 1980). Buildings nearby main roads are more vulnerable than others (Maguire & Bennett, 1982). Anstey argues that police presence, neighborhood reputation, and community watch programs are other opportunity factors for a burglar (Anstey, 1998).

In this study, criminal method (technique) which is used to enter a target house, and time of burglary were discussed as opportunity factors.

#### *2.3.1.1. Criminal Method (Technique)*

Why do burglars focus on some specific targets and are not interested in others? Which characteristics of the targets attract the burglars' attention? One of the answers to the question will be that they choose the "easiest and safest available entrance" (Fisher, 2004, p. 424) as it is explained through Rational Choice theory. The other answer to that question is the lack of guardianship of the victims in those target houses.

Burglars generally enter houses by forcing the window or door (Mawby, 2006, p. 281). In the United States, burglars predominantly use two techniques to enter their target houses: forcible entry or unlawful entry. Burglars who use the forcible entry method generally enter the houses through either removing or damaging the door. Screen damaging or removing, and handle/lock removing (or tampering) are other common types of forced entry techniques. Windows are another way for burglars to use a forcible entry method. Pane damage or removal, screen damage or removal, and lock damage are the most prevalent methods for burglars who

use forcible entry techniques through windows. Burglars who use the unlawful entry method generally do not need to use a technique to enter the target houses since unlocked doors and windows or open doors and windows give enough opportunity to them. The other methods for burglars who use unlawful entry techniques are using stolen keys, unknown means through locked door or window, picked lock or window, someone let the offender in, and offender pushed his way inside (U.S. Department of Justice, 2010).

Yang and Schneider studied residential burglary in Gainesville, Florida by using police records. They explored temporal and structural patterns of burglaries in the city with the assistance of location quotient measure. According to the findings of the study, burglars generally choose single swing doors (31.97%) and sliding windows (23.03%) as a point of entry. Burglars less prefer double hung windows (8.06%) and glass sliding doors (6.26%) accordingly (Yang & Schneider, 2005).

According to British Crime Survey results in 1998 and 2000, doors and windows are the most common points of entry to the residential houses. Burglars use doors in all dwellings (detached or semidetached houses, terraced, and flats) more than windows (71/32) to enter the target houses. Burglars who use doors as point of entry generally use three techniques: forced lock, door not locked, and break or cut door panel, respectively. The other less common techniques to enter through doors are false pretences, stolen door key, and pushed past person opening the door. Burglars who use windows as a point of entry use three techniques to enter the target houses: forcing the window lock or catch, breaking or cutting glass, and open windows or ones that open easily when they are pushed (Budd, 2001).

A group of scholars completed a survey in Leicester, United Kingdom, with the participation of 86 burglary offenders who are still under supervision of Leicestershire and Rutland Probation Service. The study aimed at identifying factors that influence decision making of burglars while they were choosing their targets. The most common way to enter the house was through ground floor rear window (53.5%); the second way was through the back door (43%). The least common ways of entry were pretending to be an official (58.1%), using upstairs windows (38.4%), front door (38.4%), and ground floor front window (29.1%), respectively (Palmer, Holmes & Hollin, 2002).

A survey was conducted with residents of Seattle by a group of scholars in order to measure the effects of guardianship (both individual level and neighborhood level guardianships) on the reduction of burglary victimization. Target hardening (the number of safety precautions), home occupancy (the number of days/nights home occupied), informal social control (whether neighbors watch home) and defensible space (the number of property characteristics) were the independent variables of the study. Target hardening is defined as residents' precautions (such as locking the doors, keeping the lights on when they are out of the home, home alarm, or having a dog at home) in order to prevent a possible burglary. By using multilevel logistic regression analysis, they found that target hardening along with defensible space is the most important precaution to prevent burglary victimization as an individual-level guardianship (Wilcox, Madensen & Tillyer, 2007).



### 2.3.1.2. *Time*

Past studies indicated that home occupancy is the main factor that influences the decisions of burglars when they would commit a crime. It is directly related with the lifestyles (or routine activities) of households (Moreto, 2010). Considering the time of burglary crime, there is no huge difference between night and daytime rates in the United States when household members are not at home (daytime: 38.05%, nighttime: 43.65%, unknown time of the day: 18.3%). However, burglary crime is generally committed in the nighttime when household members are present at home (daytime: 32.9%, nighttime: 61.3%, unknown time of the day: 5.8%); and in the daytime when household members are not present at home (daytime: 43.2%, nighttime: 26%, unknown time of the day: 30.8%), (U.S. Department of Justice, 2010). According to the data from FBI records, 445,136 burglaries are committed in the nighttime, 818,167 in the daytime (almost double of nighttime), and 332,706 could not be determined when the burglary is committed (Federal Bureau of Investigation, 2010). Sagovsky and Johnson (2007) found that more than 65% of burglaries take place in the period between 9:00 a.m. and 6:59 p.m. They interpreted the results that most people who work in the daytime make their houses more vulnerable to burglary and other crimes. Temporal patterns of burglary may differ in other countries. As an example, 56% of burglaries take place in the evening and nighttime in Great Britain (Budd, 1999). A survey conducted in Dar es Salaam, Tanzania, showed that most of the burglaries (48%) took place between midnight and 6:00 a.m. (Robertshaw, Louw & Mtani, 2010).

Police records in Australia, which include more than 14,000 burglary cases in two years, showed the same result related to time of the burglary: most of the burglary crimes are committed in the daytime when household members generally are at work (Ratcliffe, 2001). According to police records in the state of Maine, 4,611 burglary crimes were committed in 2007. Police couldn't determine the exact time of 1,209 burglary cases. When taken into consideration only burglary cases whose time of the crime is estimated, 2,217 of the burglaries (65%) were committed in the daytime between 6:00 a.m. and 6:00 p.m. while 1,185 of the burglaries (35%) were committed at night between 6:00 p.m. and 6:00 a.m. (Government of Maine Website, 2007). Police records in Vermont indicate that 64% of the burglary crimes occur at daytime between 8:00 a.m. and 8:00 p.m. while 36% of the burglaries occur in nighttime (State of Vermont Department of Public Safety, 2001).

While there is not huge difference among seasonal variation of burglary in the world as a whole, there are some local contributing factors that influence high rate of burglary in the summer time (Weisel, 2002). A study conducted in Merseyside, a metropolitan county located in North West England with a population with 1,365,900, revealed that calls to police for burglary cases have 35-40% seasonal variation in a three-year period (1988, 1989, and 1990). While the burglary rate was at the highest level during winter season, it was at the lowest level in the summer season. During spring season, the burglary rate was decreasing and in the fall season, it was increasing. As an example, there were 772 calls to police for burglary in a four week period spanning February and March; however, there were only 473 calls in a four week period spanning July and August. There was a 39% drop between the winter and summer season

(Farrell & Pease, 1994). Sorensen (2004) found that a proportion of completed burglaries is the highest in winter season with 31.1% and it is lowest in the spring season with 20.8%. In spring and summer seasons, people generally do not shut and lock their doors and in this case, burglars find opportunity to commit crime. However, burglary cases are not as many as in winter and fall seasons since gardeners work in summer and spring seasons and they make informal surveillance of the target houses. In winter and fall, daytime is relatively short and people use more electricity. If the interior lights are not on, that gives an idea to the burglars that households are not at home. Moreto argued that increased guardianship by children, thanks to closed schools, is another factor that explains why fewer burglaries take place in summer months (Moreto, 2010). Temperature, activities accessible to the public, and the length of days are some other contributing factors that influence variation in burglary (Weisel, 2002).

### **2.3.2. Offender Factors**

Offender or host factors are personal characteristics of people which are assumed to contribute to criminality. Some of the offender factors are age, gender, ethnicity, social status, educational level, occupation, and marital status. In this dissertation, four main characteristics of humans will be examined as offender factors: age, gender, marital status, and educational level.

Burglary is committed by young males who grew up in the street culture where the unemployment rate is relatively high (Sagepub, 2011). It is also claimed that burglary is a crime committed generally by people who are from relatively low socioeconomic status (Davidson, 1981; Sagepub, 2011). Annual income, crowding, and housing conditions are the most common variables which are used as an indicator of socioeconomic status of the people (Anstey, 1998).

Twenty percent of burglars commit seventy five percent of all burglary crimes in a specific area (Salmelainen, 1995, p. 24).

Meierhoefer (1992) has studied the restructuring efforts of a federal sentencing system in the United States in 1980s and “the relationship between offense and offender characteristics and the sentence imposed” (p. 5). While explaining offender characteristics, she used three variables: age, gender, and drug use. Weatherburn focused on five offender factors while explaining “the relationship between economic adversity and crime”: family size, family type, age, social mobility, and ethnicity (Weatherburn, 1992, p. 4).

Anstey’s approach is very striking while explaining the offender factors of burglary. He argues that age, instability, and socioeconomic status are among the most important factors to motivate a burglary offender. While gender is also a significant factor, he used gender as a control variable in his study (Anstey, 1998). He cited that more than 80% of burglars in Canada were 25 years old and younger by 1994, and they were arrested relatively more than experienced burglars since these young burglars were choosing closer targets and less sophisticated techniques (Maguire & Bennett, 1982). While explaining the instability factor, Anstey distinguished younger offenders and adult offenders. For younger offenders, instability refers to family; and for adult offenders, instability refers to personal attachments (Anstey, 1998). When domestic violence and alcohol and drug use are prevalent among family members (especially parents), young members of the family would tend to commit crimes such as burglary. One-parent families are another disadvantage for children as an instability factor in terms of burglary offending (Brown, 1982).

In this dissertation, four personal characteristics; age, gender, marital status and education level are examined as offender factors.

#### *2.3.2.1. Age*

That age is a contributing factor of criminality has been on the agenda of criminologists for a long time. A study in the State Prison of Southern Michigan in 1943 revealed that younger men tend to commit cruder methods of stealing while older men prefer to commit more skillful crime. Crimes such as auto theft, burglary, robbery, and kidnapping are peculiar to young offenders while other crimes such as embezzlement, fraud, and forgery are peculiar to older men. Fox (1946) found that the mean age for burglary prisoners was 30.5.

The average age for Australian burglars is 19.5 and the mode is 16. Half of the burglars in Australia were under 18 years old (Ratcliffe, 2001). Data from the Federal Bureau of Investigation indicated that 63% of arrested burglars were under 25 years of age in 1999 (Federal Bureau of Investigation, 2000). Police records in Maine (USA) in 2002 showed that 38.9% of the arrested burglars were 17 years old and younger; 40.2% were between 18 and 24 years old. Only 4.5% of the burglars were 45 years old and over (Government of Maine Web site, 2002). In Connecticut, the median age of convicted burglars was 21 and the last conviction age was 28 by 2007 (Cox, 2007). Since burglars commit crimes generally on foot and need to run fast in case of necessity, they are generally young people.

#### 2.3.2.2. *Gender*

It is a fact that women and men get involved in criminal activities in different periods of their lives, but there is difference between the involvement rates of genders. Except for prostitution, men always commit more crimes than women, especially when serious crimes are under discussion (Steffensmeier & Allan, 1996). As an example, males committed four times as many crimes as females in England and Wales in 2002. In serious crimes, the percentage of criminal males is between 85 and 95 in the same area and year (Office for National Statistics, 2004). According to data retrieved from the Federal Bureau of Investigation, 87% of arrested burglars in 1999 were male (Federal Bureau of Investigation, 2000). Males convicted of burglary were nearly ten times more numerous than convicted females according to Uniform Crime Report in the United States in 1990. By 2007 in the State of Connecticut, 4,513 of 4,689 prisoners (96.2%) were male (Cox, 2007). There were 1,848,906 cases judged at the criminal courts under Turkish Criminal Law and Special Laws and 2,401,348 suspects in those cases were accused of different criminal reasons in Turkey in 2008. Among those suspects, 10.16% (243,996) were female and the rest of them were male (Turkish Statistical Institution, 2010).

Some feminist criminologists argue that the main reason why women get involved in crime is that social life is dominated by men and that this situation leads women to become marginalized (Laidler & Hunt, 2001). This marginalization generally pushes women to commit female-dominated crimes, but even though it is rare, they join into male-dominated crime groups and gangs (Daly, 1989). As an example, Alarid et al., found that women's participation in a burglary gang, which is comprised predominantly of men, is a result of that consideration (1996).

In any case, when women join such burglary gangs, they generally undertake secondary roles such as partner and accomplice. Instead of breaking-in the houses or planning the burglary, they generally drive the car or act as lookout while their partners do the jobs (Decker et al., 1993). An interview with 49 theft offenders revealed that male offenders worked with females temporarily and they usually perceive them as romantic partners (Steffensmeier & Terry, 1986). Drug addiction is correlated with involvement in burglary—for females in particular (Steffensmeier & Allan, 1996).

In their prominent study (interviewing active burglars), Mullins and Wright (2003) found that the initiation of both male and female burglars is nearly the same: they were introduced to crime through family members, older friends, and street associates. However, while male offenders were persuaded by same sex peer groups, female burglars were generally convinced by their boy friend, and even sometimes they were coerced. Many of the female burglars asserted that in their first burglary, they were unaware of any criminal intention until they arrived at the target houses. The main motivation for burglary for both males and females was earning money to compensate the expenditures of drugs, but females added that they needed money to buy jewelry and clothes, also. Female burglars also commit crime to feed their children and satisfy their needs, though males do so only for their needs. The preferences of the male and female offenders for choosing the target are the same: the house should be unoccupied, and there must be valuable things inside. While most of the male burglars have legitimate jobs (such as gardener, television installer, and home remodeler) which help them to determine possible targets before burglarizing, female burglars have not. Male burglars generally prefer to work

alone, although female burglars prefer to work with male burglars. The main reason male burglars work alone is not to entrust themselves to anyone else, and the main reason for female burglars to work with male partners is that they believe that if they are caught and arrested at the end of the burglary, they may be punished less by stating that they were coerced by male co-offenders to join the burglary gang and commit a crime (Mullins & Wright, 2003).

#### 2.3.2.3. *Marital Status*

Marital status of a person can be a determinant factor for many crimes. It is claimed that the breakup of a family may have traumatic effects for both the parents and children. Divorcing generally leads to job inefficiency, occupational mobility, occupational detachment, and drunkenness for the couples. As an example, among 473 persons convicted of forgery, 118 were single (24.9%), 172 were married (36.3%), and 183 were divorced, widowed, or separated (38.6%) in Los Angeles, California, in 1940 (Lemert, 1953).

Felson and Cohen (1980) claimed that single and divorced adults get involved in criminal activities much more than married couples since they are less likely to be subject to social control. Married couples join formal social organizations much more than unmarried or divorced people. They also have close relationships with their neighbors, so their informal social control mechanisms are stronger than unmarried or divorced people (Tomeh 1973). Sampson and Laub argue that if a criminal offender finds a good partner and gets married with the right person, he or she can quit criminal activity and desist from old habits. They deem this change as a “turning point” since marriage is part of a social bond for a person (Sampson and Laub, 1993). Blau and Blau (1982) argue that while there is no evidence to prove a correlation between single-parent



families with children and crime, separation and divorce have an important impact on adult criminality. Sampson found that divorce is the most important contributing factor on white adult robbery (Sampson, 1986).

#### *2.3.2.4. Education Level*

Weiss and Sampliner (1945) found that nearly 24% of adult criminals did not complete high school, more than 70% are high school graduates, and 5% have at least some college. A group of scholars in Turkey found that lack of education is one of the primary reasons of criminality in Turkey (Icli et al., 2010). Burglars are generally poorly educated people in society (Sagepub, 2011). The education level of burglars is parallel to the other offenders in Connecticut, USA. High school attendants and people who have high school diplomas are the prevalent part of the convicted burglars. While 8% of convicted burglars did not attend high school, 11% of convicted burglars either attend or graduated from a university (Cox, 2007).

### **2.3.3. Environmental Factors**

Environmental factors are factors that exist in a living area of a person and affect his or her behavior one way or another (Glanz, Lewis, & Rimer, 1997). Environmental factors are generally related to the location of the target houses. There are some characteristics of certain neighborhoods or houses which attract burglars much more than others. Prior studies indicated that burglars decide where to commit burglary first, and then they look for an appropriate target (Wright & Decker, 1994). Neighborhood influence on criminal victimization is also widely studied in criminology. Scholars who study neighborhood influence generally focus on two subjects: ecological tradition characteristics (general characteristics of the residence of a

neighborhood or city) and adjacent tradition characteristics (features of residents from adjacent neighborhoods) (Elffers, 2003). It is argued that people who live in a certain neighborhood are influenced by the features and characteristics of their environment (Farrington, Sampson & Wikstrom, 1993; Shaw & McKay, 1972). Since criminals generally reside in socially disorganized neighborhoods, it also increases the risk of being a victim of crime for people who live in those areas (Mawby, 2001). Reiss and Farrington claim that people who have criminal records reside in high burglary risk areas (Reiss & Farrington, 1991).

There are numerous environmental factors that mitigate or aggravate the burglary risk of victims and houses. Houses located in socially disorganized areas and/or socially disadvantaged neighborhoods experience relatively more crimes than better neighborhoods. The main reasons for that high criminality in those areas are low collective efficacy, high level of residential mobility, high level of residential heterogeneity, inadequate personal security measures and less informal surveillance (Capowich, 2003). The surrounding areas of some institutions which are located in socially disorganized and poor neighborhoods such as public housing are deemed as high-risk areas in terms of burglary (Moreto, 2010). Houses which are close to congested areas with generally young people, shopping centers, and sport arenas are more vulnerable than others in terms of burglary (Tilley et al., 1999). Houses which are close to highways (Beavon, Brantingham and Brantingham, 1994), pedestrian paths (Poyner and Webb, 1991), and houses located in suburbs of neighborhoods (Brantingham and Brantingham, 1984) are more vulnerable than others.

Burglars would want to sell stolen goods to the closest shops or they do this activity through fences. Fences are described as "...a person who regularly buys stolen property for resale and who often has a legitimate business to cover his activities" (Sagepub, 2011, p. 13). Burglars who have no contact with fences will get in touch with pawn shops, drug dealers, or acquaintances that have contacts with those shops or fences in the surrounding area of the target houses. So, the surrounding areas of pawn shops are other attractive targets for burglars.

Public Transportation stations such as bus stops increase the risk of burglary victimization. Burglars who do not want to use their own vehicles in order to reveal their identities to residents and law enforcement units prefer using public transportation vehicles such as busses and the metro. The only disadvantage in using public transportation is that the carrying of heavy and large goods through public transportation is cumbersome and it attracts public attention (Moreto, 2010).

It is obvious that housing type is another determinant for burglars to choose their targets. Hotels, motels, and rooming houses are the most vulnerable places when occupants are not present. Mobile homes are preferred even if just a bit more by burglars in case a household member is present at home. Although there are no huge differences among vulnerability rates of the number of housing units, group quarter units are a little bit more vulnerable than others in the United States (U.S. Department of Justice, 2010).

Police records were compiled (Johnson, Bernasco, Bowers, et al., 2007) that related to some characteristics of burglary crime (date of the crime and grid coordinates of the victims' houses) from ten areas located in five different countries (Australia, Netherlands, New Zealand,

United Kingdom, and United States of America). A dwelling found within 200 meters around a burglarized house is at high risk in the following two weeks.

In this study, distance between home addresses of burglars and target houses and distance between target houses and police stations will be examined as environmental factors.

#### 2.3.3.1. *Distance between Target Houses and Home Addresses of Burglars*

The issues relating the effects of distance for journeys to commit crimes are attractive for criminologists since White's initial studies in early 1930s. He argued that crimes against people are more intense than crimes against property in the vicinity of the offenders' homes (White, 1932). While it is widely accepted that offenders generally commit crimes near their own neighborhoods, the variations of the distances are explained by complexity and type of the crimes (Brantingham & Brantingham, 1981). As an example, it was found that juveniles generally commit crimes within a two mile vicinity of their homes and they almost never go further than six miles to commit a crime (Phillips, 1980). Hodgkinson and Tilley found that only 5.7% of burglaries in dwellings and 4.3% of burglaries in other houses occurred beyond 15 minutes away from where the victim lives (Hodgkinson & Tilley, 2007)

The concept of *distance decay* is derived from physical science and it means that when objects get away from each other, the interest to each other diminishes at the same time (Levine, 2005). When burglars make their decision, they would choose the closest one to their home address (Brantingham & Brantingham, 1984; Shover, 1991) as this requires minimum effort (Harries, 1999). As people go shopping to closer malls, criminals choose the closer targets with the same reason (Levine, 2005). The major reasons why criminals do not choose further targets

are that they do not want to be under risk for a longer duration of time, they are unfamiliar with those areas, the probability to attract attention is relatively high, and opportunities to run away are more difficult (Brantingham & Brantingham, 1981; Ratcliffe, 2001).

A study conducted in Sheffield (England) in 1995 revealed that offenders travel 1.93 miles to commit a crime on average (Wiles & Costello, 2000). Another group of scholars, who studied in the London Borough of Harrow (England), have found the average distance to be 1.16 miles, to commit a violent crime, criminals travel 0.77 miles on average, 1.47 miles for robbery, for vehicle theft 1.48 miles, and for shoplifting 1.68 miles (Chainey, Austin & Holland, 2001). For vehicle theft and shoplifting, Wiles and Costello (2000), uncovered 2.36 miles and 2.52 miles, respectively. For rape, criminals travel 1.15 miles (Rhodes & Conly, 1981); finally, for sexual assault they would travel .07 miles (Block, Galary & Brice, 2004). Studies relating burglaries yielded similar results. Scholars who study on Washington D.C. in 1974 found 1.62 miles (Rhodes & Conly, 1981); ones who studied in the Australian Capital Territory in 1999-2000 found 3.11 miles; ones who studied in the London Borough of Harrow found 1.21 miles (Chainey, Austin & Holland, 2001); and ones who studied in Sheffield in 1995 found 1.88 miles for travelling in residential areas (Wiles & Costello, 2000). Traveling for burglaries in non-residential areas does not vary too much: 1.83 miles in Sheffield in 1995 (Wiles & Costello, 2000) and 3.11 miles in another study (Ratcliffe, 2001).

The National Crime Victimization Survey in the United States indicated that 27.5% of the offenders are not known, 65.1% of them are not a stranger, and 7.4% of them were unknown by

the victims (U.S. Department of Justice, 2010). It means that they did not travel so far away from their home addresses.

A study completed in Leicester revealed that burglars generally choose their targets in their home area (40.6%). Of the respondents (all of them were burglars) who participated in the survey, 83.5% said that they were familiar with the area where they chose. The main reasons for burglars not to go to unfamiliar places were that they knew the area (it is easy to hide in a well-known place) and they can choose profitable targets in the close areas (Palmer, Holmes & Hollin, 2002).

#### *2.3.3.2. Distance between Target Houses and the Nearest Police Station*

A group of scholars studied the possible causes of household burglary in a city (Tianjin) in China by using a multilevel regression modeling method. They categorized all variables under three major determinant factors: neighborhood structural factors, household variables, and neighborhood social control processes. Public control is deemed as an indicator of neighborhood social control processes and the scholars aimed to measure if public control (encountering police force frequently) reduces burglary rates or not. The results of the scientific research indicated that neighborhoods where police are highly visible by residents and others bear low risk in terms of burglary (Zhang, Messner, Liu, 2007).

Segato, who studies bank robberies in Italy, found that banks in Montagnana have been robbed in the last six years and he explains this situation with the proximity of banks to the police station (Segato, 2004). In their prominent study, Akpınar and Usul (2004) found that crimes are committed far from the police stations in Ankara, Turkey. There were 1910 crimes

were recorded in two police precincts of Cankaya City in 2003, and only 157 of 1910 took place in the zone which is labeled as “near to the police station.” Among 1041 burglaries, 92 of them were in the “near” zone and 949 were in the “far” zone relative to the police stations.

Based on the scientific studies in the past, Moreto concluded that “the increased presence of authorities, the increased likelihood of authorities being present and the increased ability of authorities to respond quickly can be considered mitigating factors resulting in a decrease of risk in an area” (Moreto, 2010, p. 3). The presence of a police station in a region reduces or prevents crimes in the surrounding area through two ways. On the one hand, police patrols and personnel continuously commute from and to the police station and that close area to the police station would always be under police surveillance. On the other hand, police response to areas close to the police stations would eventually be shorter, and that would lead to deter people from committing crimes, at least theoretically. That offenders tend to shy away from police intervention is also possible (Sun, 2000). Rengert studied the possible impact of police stations to the drug sale arrests in close areas. The distance between the blocks in Wilmington, Delaware was nearly 400 feet and he made up fictitious zones around the police stations. Then he found that the further from a fixed point to the police station, the higher probability for an arrest due to drug sales (Rengert, 1999).

#### **2.4. Theoretical Framework**

In this study, epidemiological criminology theory is thought of as a basic theory for integrating two theoretical perspectives such as routine activity theory and rational choice theory.

### **2.4.1. Epidemiological Criminology**

Many ideas were put forward over the centuries about the formation of crime and the factors that constitute a crime. What are the underlying causes of a crime? Do people commit crime with economic and social reasons or an insufficient level of education? Does everyone who grows up in the same environment commit crime? Classical theories of criminology were inadequate to answer these questions. Some scholars argued that new criminological hypotheses, methods, and techniques can be postulated through a new concept called “epidemiological criminology” (Akers & Whittaker, 2010).

Epidemiological Criminology is defined as

...the explicit merging of epidemiological and criminal justice theory, methods and practice. Consequently, it draws from both criminology and public health for its epistemological foundation. As such, EpiCrim involves the study of anything that affects the health of a society, be it: crime, flu epidemics, global warming, human trafficking, substance abuse, terrorism or HIV/AIDS. (Lanier, 2010, p. 72)

For example, why men commit more crime than women is a matter beyond the simple criminological theories (Henry & Lanier, 2001). It is obvious that there is a need to cooperate between criminal justice and public health in order to reduce drunken driving (Lanier & Luty, 2009).

In this dissertation, epidemiological criminology is used as theoretical framework of two common criminology theories such as routine activity and rational choice theories. Indeed, for example the issue that age has a determining role to select a target shall be explained only by interdisciplinary theories.



### **2.4.2. Rational Choice Theory**

Rational Choice Theory is based on the 'expected utility' principle in economic theory. The expected utility principle simply states that people will make rational decisions based on the extent to which they expect the choice to maximize their profits or benefits and minimize the costs or losses. This is the same general assumption about human nature made in classical criminology" (Akers & Sellers, 2004, p.23). This theory explains that even criminals make rational decisions when they commit a crime, and the theory tries to explain what factors shape the decision making process of the criminals. As an example, they choose the targets which satisfy them immediately, those which require little effort to have it, and those that entail less risk of being arrested (Lilly, Cullen & Ball, 1995). They also predict probability of arresting and probable duration of imprisonment in return for their criminal acts (Cornish & Clark, 1986). To sum up, people commit a crime when they think that benefits of their behavior outweigh their costs (Lilly, Cullen & Ball, 1995).

Tunnel (1990) found that burglars commit crime because they want to raise income, they expect not to be arrested, and if they are arrested, somehow they would not be punished with a long time in jail or prison. On the other hand, "living in prison" is not a big threat for them. Based on those findings, he concluded that those property offenders perceive the benefits as concrete outcomes while they perceive the costs as only a probability. Cromwell and his colleagues also found that burglars behave partially rational when they decide to commit a crime. They do not calculate pros and cons of their acts very well. While the benefits of their actions are obvious and tangible, the costs are intangible and probable (Cromwell, Olson, & Avary, 1991).

Burglars would probably choose closer targets to them in order to spend less effort or not to be laid under suspicion in far away neighborhoods. Traveling too far produces much more trouble for them. On the other hand, they would want to be away from police as much as possible. So, they will probably choose targets which are far from police units.

### **2.4.3. Routine activity theory**

Routine activity theory explains that criminal victimization in a society is not randomly distributed; instead, some key dimensions such as daily life, life styles and demographics play a decisive role. After World War II, while economic conditions and education levels of American society increased significantly, crime rates have not decreased, even some kinds of crimes increased during this period. Cohen and Felson argued that the lifestyles and routine activities of American society changed radically. More people work in a job and their homes are vulnerable to crimes since they were not at home in the daytime. They also argued that three important elements of crime are supposed to converge at the same time and place: a suitable target, a motivated offender and lack of guardianship. The absence of one of them would prevent the crime. They explained that guardians are not only police but also parents, friends, neighbors, dogs, and security cameras (Cohen & Felson, 1979).

Sherman et al., noticed that most of the crimes reported in Minneapolis stemmed from a very small percentage of the city (3%) and they argued that those hot spots were the results of victim-predator convergence and lack of guardians at the exact time of crimes (Sherman, Gartin & Buerger, 1989). Kennedy and Forde (1990) also found that people who go out to bars, school, or work are more vulnerable to property crimes than people who generally stay at home in

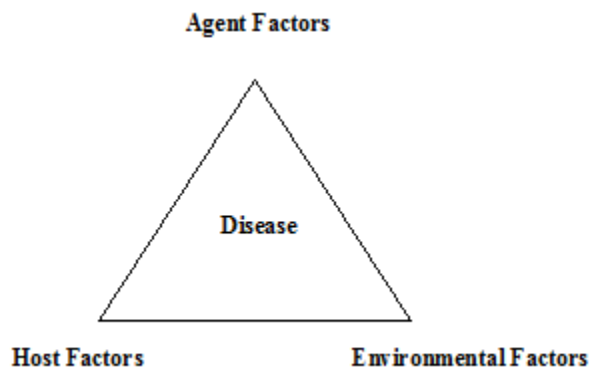
Canada. Mustaine and Tewksbury (1998) also supported the idea that some legal activities such as eating in a restaurant oftentimes and some illegal activities increase the risk of theft victimization slightly. After a hurricane disaster in Florida in 1992, temporary lack of guardianship of police in the area increased the vulnerability of residents and led to relatively high theft crimes that were reported at that time (Cromwell, Dunham, Akers & Kaduce, 1995).

The houses that have no preventive measures against burglary (such as alarm, door lock, or window lock) or have less preventive measures would be a suitable target for burglars since they don't need to use sophisticated techniques in order to enter (Zhang, Messner & Liu, 2007). On the other hand, since adults generally work in the daytime, there is less likelihood that there will be guardians for their house, and they will be more vulnerable in the daytime (U.S. Department of Justice, 2010). So, it will be easy for burglars to commit crime in the daytime. Motivated offenders have generally low educational level (Icli et al., 2010), and they are generally unmarried or divorced (Felson and Cohen, 1980). Motivated burglars are generally young (Ratcliffe, 2001) and male (Steffensmeier & Allan, 1996).

## **2.5. Conceptual Model**

In Public Health, it is argued that a disease occurs as a result of agent, host, and environmental factors. Agent factors are referred to as physical forces, psychological factors and stress, endogenous chemicals, exogenous chemicals, nutritive elements, and genetic traits. Host factors are host behavior and immunity and immunological response. Environmental factors are categorized under three main groups: social environment (cultural, political, and economical),

biological environment (fauna and flora), and physical environment (moister, heat, and cold) (Schneider, 2011).

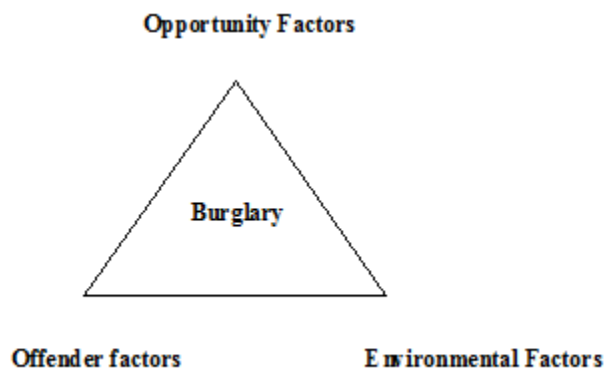


Adapted from Schneider, 2011.

### **Figure 1 Factors that Lead Disease**

By employing epidemiological criminology, it is possible to apply agent, host and environmental factors as predictors of crime (Lanier, 2010, p. 72). In doing so, understanding the etiology of crimes could guide the development of prevention and take necessary precautions against them. As a matter of fact, Zinberg applied this triangle to drug use. He concluded that public officials make a mistake by focusing only on intervention of usage of the drug. As a matter of fact, Zinberg applied this triangle to drug use. He concluded that public officials make a mistake by focusing only on intervention of drug usage. Instead, what public officials must consider factors related to drug users or set (host), drugs (agent), and environment where the drug is used extensively (Zinberg, 1984).

This triangle was used to clarify the question “Why People Gamble,” a study conducted by Health Research Council of New Zealand. The council defined the terms as the following: “the agent is exposure to gambling activities, the host is the person with a gambling problem, and the environment is the physical, social and cultural context in which the host lives and gambling occurs” (Tse, Abbott, Clarke, Townsend, Kingi, & Manaia, 2005, p. 120).



**Figure 2 Theoretical Diagram of Factors influencing Burglary**

When this disease triangle is applied to burglary crime, the opportunity factors are conceived as agent factors, offender factors are host factors, and environmental factors would remain the same.

## **2.6. Hypotheses**

Criminology theories beginning with ‘classical criminology theory’ emphasized offender factors. According to Classical Criminology Theory, committing a crime is a kind of weighing benefits and costs for an offender. If he or she realizes that it is worth doing, or being punished is

less likely, he or she commits a crime (Beccaria, 1963). Cornish and Clarke (1986) explained crime as “rationality.” According to them, criminals were rational like everyone else and people commit crime if costs outweigh benefits. Individual Trait Theorists argued that psychological and biological traits of criminals are different from the others, and those different traits along with some other environmental factors were the main causes of criminal behavior (Glueck & Glueck, 1950). Hirschi focused on both offender and environmental factors to explain criminality. He asserted that internal (e.g., self control) and external factors (e.g., social bonds) prevent people from committing crimes in general (Hirschi, 1969). Feminist scholars explained crime by gender factor. They argued that men resort to crime in order to have control over women in a deviant way (Messerschmidt, 1993; Adler, 1975; Daly & Chesney-Lind, 1988).

It is apparent that there is not so much research about which factors are relatively more influential than others in the formation of a crime. Productivity Commission conducted a study in order to reveal which factors are more influential than others to explain the variability on regular gambling. They found that offender factors (age and city residence) were more important factors than other factors to explain regular gambling (Productivity Commission, 1999). Anstey argues that offender factors such as age, instability, and socioeconomic status are the most important factors to motivate a burglary offender (Anstey, 1998).

In light of scientific studies reviewed in criminology, two hypotheses were proposed in this dissertation:

**H.1.** Offender factors are more influential than opportunity and environmental factors in explaining the variability in the frequency of burglaries committed.

**H.2.** Offender factors are more influential than opportunity and environmental factors in explaining the likelihood of committing repeated burglaries.

These two hypotheses were tested, and the results are discussed in the following chapters.

## **2.7. Summary of Chapter**

Factors that influence people to commit a serious crime were always an attractive subject for scholars in the past. It continues to attract attention to public policy decision makers. It can be argued that factors leading to the commission of a serious crime are important for predicting burglaries, also. In this study, the predictive factors were categorized into three broad groups, adapting the disease triangle model: opportunity factors, offender factors, and environmental factors. In this study, criminal method (technique), which is used to enter a target house, and time of burglary were discussed as opportunity factors; four personal characteristics: age, gender, marital status and education level are examined as offender factors; and distance between home addresses of burglars and target houses and distance between target houses and police stations will be examined as environmental factors. The epidemiological criminology theory is thought as a basic theory for integrating the two theoretical perspectives such as routine activity theory and rational choice theory. Two hypotheses were proposed to test the frequency of burglaries committed and the likelihood to commit repeated burglaries.

## **CHAPTER.3.METHODOLOGY**

### **3.1. Introduction to Methodology**

The City of Bursa, located in north-west part of the country, includes 17 towns with an area of 10.819 km<sup>2</sup> and it is the fourth most crowded city (2,439,876 in 2007) in Turkey (Governorship of Bursa, 2010a). Demographic characteristics of City of Bursa parallel to ones with Turkey. Population in rural areas decreases while in urban areas it increases in both Bursa and Turkey. The percentage of male and female of the population is the same in both levels. Average age of the population is 28.5 for Bursa and Turkey (Governorship of Bursa, 2010b).

The city was first founded around Mount Uludag, which is one of the highest mountains in the country. Under the hegemony of Byzantine and Ottoman Empires, the city developed rapidly. As a result, Bursa became a main cultural, trade, and industry center in 15<sup>th</sup> century. By 2002, 16.3% of total exports of Turkey were carried out by businessmen in Bursa (Uludag University Publications, 2010).

In this study, the burglary issue in Bursa city and some characteristics of burglars and their environment were examined. The data subject to the study belongs to Bursa Police Department of Public Security and Department of Juvenile Crime. The Department of Public Security classified many crime data conducive to scientific studies under a project called BEMTAP. In this project, Bursa police recorded information about all of the events, suspects and victims between 1993 and 2009. Thanks to the assistance of the project and huge efforts of city



police, nearly 20,000 suspects were arrested, and they have been delivered to the judicial authorities so far (Bursa Emniyet Mudurlugu, 2010).

### 3.2. Study Variables

In BEMTAP Project, there were 42 columns all of which represent information related to the crime scene, time or offender characteristics. In this dissertation, only ten variables (eight independent and two dependent variables) were used since some of the variables were not subject to study (such as occupation).

**Table 2 Variables of Determinants of Burglary and Repeat Burglary**

	<b>Variable</b>	<b>Type</b>	<b>Attribute</b>	<b>Role</b>	<b>Source</b>
Opportunity Factors	Criminal Method	Categorical	1=easy; 2=medium; 3=difficult	Independent	BEMTAP Data Base
Opportunity Factors	Time	Nominal	0=day; 1=night	Independent	BEMTAP Data Base
Offender Factors	Age	Categorical	1=10-17; 2=18-27; 3=28-37; 4=38-47; 5=48 and over	Independent	BEMTAP Data Base
Offender Factors	Gender	Nominal	0 = female, 1 = male	Independent	BEMTAP Data Base
Offender Factors	Marital Status	Nominal	0 = married 1 = single	Independent	BEMTAP Data Base

	<b>Variable</b>	<b>Type</b>	<b>Attribute</b>	<b>Role</b>	<b>Source</b>
Opportunity Factors	Criminal Method	Categorical	1=easy; 2=medium; 3=difficult	Independent	BEMTAP Data Base
Offender Factors	Education level	Categorical	1=not attend school; 2=elementary; 3=Middle; 4=High 5= College, university and master degree	Independent	BEMTAP Data Base
Environmental Factors	Distance to Home Address	Categorical	1=0-499 m; 2=500-999 m; 3=1000-1499 m; 4=1500-1999 m; 5=2000 m and over	Independent	BEMTAP Data Base
Environmental Factors	Distance to Police Station	Categorical	1=0-499 m; 2=500-999 m; 3=1000-1499 m; 4=1500-1999 m; 5=2000 m and over	Independent	BEMTAP Data Base
Dependent Variable	The Number of Burglaries	Categorical	Numbers	Dependent	BEMTAP Data Base
Dependent Variable	Repeat Burglary	Categorical	0 = 1 burglary; 1 = more than 1 burglary	Dependent	BEMTAP Data Base

### **3.2.1. Independent Variables**

There are eight independent variables in the data set. While five independent variables are categorical variable, the rest three are nominal variables.

#### *3.2.1.1. Opportunity Factors*

There are two opportunity factors which are assumed to have impact on the number of burglaries in Bursa: Criminal method and time of the burglary.

#### **Criminal Method of Burglary**

Zhang, Messner, and Liu conducted a scientific study in order to measure the risk of burglary in Tianjin, China, in 2007. They argued that household variables, neighborhood social control processes, and neighborhood structural factors are the determinants of the vulnerability of the target houses. Two of the eight household variables were taking preventive measures against burglary such as locking the door, and having an antitheft door. They asked the respondents of the survey, “When everyone is away from home, how often do you lock the doors?” and “Does your house have an anti-theft door?” The answers to the first question were in a Likert scale format: 1 = almost never, 5 = almost always. The answers to the second question were a dummy variable: 1 = yes, 0 = no. Using multilevel regression modeling, they found that household variables increase the burglary vulnerability of the houses as in Eastern countries (Zhang, Messner & Liu, 2007, p. 927).

The first opportunity factor of burglary was *criminal method*, which is an independent and categorical variable. In BEMTAP Project, there are 15 different types of burglary techniques: entering through an open door or window, entering through the balcony, entering through roof (ceiling), entering through climbing the wall, entering through vent window, key fitting, breaking the glass, removing the glass, breaking the door lock, breaking the door, fumbling the door, fumbling the glass, safecracking, attempting the burglary, and others. They were categorized into three groups as ‘easy, medium, and difficult’ in terms of difficulty to burglarize a house. ‘Easy criminal methods’ are the ones that either need no special ability or need less. By the same token, ‘medium criminal methods’ are the ones that need moderate ability, and ‘difficult criminal methods’ are the ones that need sophisticated ability for burglary. They were assigned as the following: (1) Easy criminal methods: Entering through open door or window, fumbling the door, and fumbling the window. ‘Attempting the burglary’ and ‘others’ are also qualified as easy criminal methods. (2) Medium criminal methods: Entering through roof (ceiling), entering through climbing the wall, entering through the balcony, entering through vent window, and breaking the glass. (3) Difficult criminal methods: Key fitting, breaking the door lock, breaking the door, removing the glass, and safecracking.

### **Time**

Some scholars have categorized burglary time into four groups: “morning (7:00 a.m. to 11:00 a.m.), afternoon (12:00 p.m. to 5:00 p.m.), evening (5:00 p.m. to 10:00 p.m.), and night (10:00 p.m. to 7:00 a.m.)” (Weisel, 2002, para. 11). In this study, time was used as a nominal and independent variable. Scholars who conducted a survey for U.S. Department of Justice described

‘day’ as a time period between 6:00 a.m and 5:59 p.m. and ‘night’ as a time period between 6:00 p.m. and 5:59 a.m. (U.S. Department of Justice, 2010). By the same token, in this study two nominal variables, day and night, were used as a nominal variable and the same time period with U.S. Department of Justice will be used. Day will be labeled as ‘0’ and night will be labeled as ‘1.’

### *3.2.1.2. Offender Factors*

Offender factors are personal characteristics that may influence decision making of the people who intend to commit a burglary crime. In this study, four personal characteristics were taken into consideration as offender factors: age, gender, marital status, and education level.

#### **Age**

A group of scholars who examined police records and conducted the British Crime Survey categorized ‘age variable’ into seven groups. The young people under 15 were not included in the study and people who were 75 and older were deemed as the upper group. The remaining six groups were categorized as ten-age groups beginning from the age 16 (16-24, 25-34, 35-44, 45-54, 55-64, 65-74, and 75 and over) (Flatley et al., 2010). In their prominent study, Wilcox et al., used ‘age’ as a control variable among others (Wilcox, Madensen & Tillyer, 2007).

As an independent and categorical variable, age was categorized into five groups in this dissertation. Each group was labeled as the following: Ages between 10 and 17 as ‘1’; 18 through 27 as ‘2’; 28 through 37 as ‘3’; 38 through 47 as ‘4’; and 48 and over as ‘5.’

#### **Gender**

In police records, 'sex variable' is categorized as 'male and female' as usual. As an example, 'sex variable' was categorized as 'men and women' in British Crime Survey (Flatley et al., 2010). In their study, Wilcox and her colleagues used sex as a control variable as well (Wilcox, Madensen & Tillyer, 2007). In this dissertation, females were assigned as '0' and males were assigned as '1.'

### **Marital Status**

In Criminal Justice statistics prepared and issued by United States Department of Justice, marital status of the offenders was categorized into four groups:

(1) married, which includes persons in common-law unions and those who are currently living apart for reasons other than marital discord (employment, military service, etc.); (2) separated or divorced, which includes married persons who are legally separated and those who are not living together because of marital discord; (3) widowed; and (4) never married, which includes persons whose marriages have been annulled and those who are living together and not in a common-law union. (Bureau of Justice Statistics, 2010, para. 5)

Marital Status was categorized into six groups in British Crime Survey: married, cohabiting, single, separated, divorced, and widowed (Flatley et al., 2010).

In this dissertation marital status, which is an independent and nominal variable, was assigned as '0' for 'married' and '1' for single.

### **Education Level**

The level of education of the burglary victims has been entitled as 'highest qualification' and classified into five categories in the British Crime Survey: Degree or diploma,

apprenticeship or A/AS level (Advanced/Advanced Supplementary), 0 level/GCSE (General Certificate of Secondary Education), other, and none (Flatley et al., 2010).

In BEMTAP project, there are eight different levels of education and in this dissertation, they were classified under five levels as follows: (1) Illiterate and literate but not attending any school; (2) Elementary School, (3) Middle School, (4) High School; and (5) University and College. Elementary Schools and Middle Schools in Turkey are united and named as primary education with Law No. 4306 as August 18, 1997 (Ministry of National Education, 2010). So, six people who graduated from primary education will be assigned as Middle School in the data.

### *3.2.1.3. Environmental Factors*

Two factors, distance of target houses to the home address of the burglars and distance of target houses to the nearest police stations were analyzed as environmental factors.

#### **Distance to Home Address**

Using police records in the city of St John, Canada, Snook examined individual differences in distances traveled for committing burglary crime. He categorized the distance into four groups: 0-5 km as 1; 6-10 km as 2; 11-15 km as 3 and 16-20 km as 4. He found that 84% of the burglars travelled within the first quartile (0-5 km); 13% of the burglars traveled in the second quartile (6-10 km); and 3% of the burglars traveled within third and fourth quartile (Snook, 2004).

In the BEMTAP Project, all burglars' home addresses and target houses' addresses were recorded. All distances between home addresses and target houses were calculated as 'meter'

through an internet program called Google Maps. Then all distances were categorized into five groups. The distances between 0 and 499 were assigned as '1'; 500 and 999 as '2'; 1000 and 1499 as '3'; 1500 and 1999 as '4'; and 2000 meters and over were assigned as '5.' While address information in the United States is very clear, it is not so clear in Turkey. So, it is impossible to find some address exactly. In such situations, the nearest location to the target house or home address of the burglars was measured and put as variable.



### **Distance to Police Station**

Tengbeh, made a scientific study in Manzini (Swaziland) in 2004 about determining possible locations for new police stations, and investigated whether the number of crimes decreased in the areas close to the police stations. He categorized the distance to the police station into nine subgroups (which are not equal to each other) and he investigated the crimes under two headings: crimes against people and crimes against property. In Manzini, there were 1593 crimes recorded in 2004 and none of them was committed in the first three zones (0-50, 50-100, and 100-150 meters). It is observed that in the following three zones the number of crimes increased gradually (150-200 meters: 46, 200-250 meters: 135, and 250-500 meters: 680). In the following three zones the number of crimes decreased gradually (500-1000 meters: 328, 1000-2000 meters: 310, 2000-4000 meters: 94). Perhaps this is because those areas were rural areas and far from the city center (Tengbeh, 2006).

In the city of Bursa, there are 26 police stations. The distance between target houses and the nearest police stations will be calculated in meters through an internet web site called Google Maps and they will be categorized into five groups. The distances between 0 and 499 will be assigned as '1'; 500 and 999 as '2'; 1000 and 1499 as '3'; 1500 and 1999 as '4'; and 2000 meters and over will be assigned as '5.' While address information in United States is very clear, it is not so clear in Turkey. So, it is impossible to find some address exactly. In such situations, the nearest location to the target house was measured and put as variable. Police Stations in Turkey were easily measured since they are public offices and recognized by the program.

### **3.2.2. Dependent Variables**

In this dissertation there are two dependent variables for two different analyses. While the number of burglaries was used as ratio, repeat burglary was used as categorical, in other words, dichotomous.

#### *3.2.2.1. The Number of Burglaries*

The number of burglaries is a dependent variable and used as ratio variable. They vary between 1 and 21 in data set.

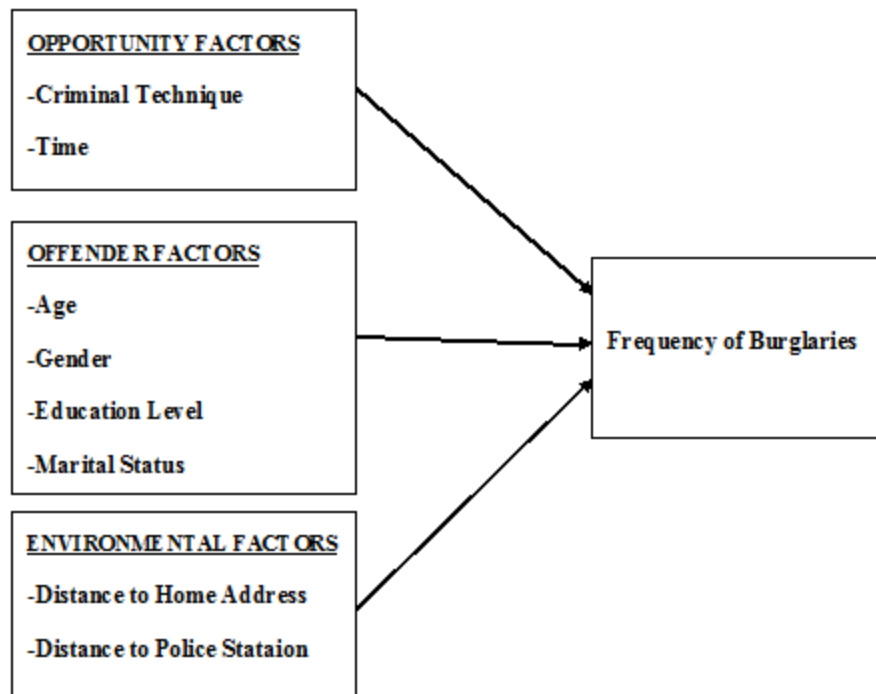
#### *3.2.2.2. Repeated Burglary*

Repeated burglary is a dependent variable. This dependent variable is dichotomous; burglaries committed only one time in a three year period are assigned as “0,” and burglaries committed more than one time in three year period were assigned as “1.”

### **3.3. Research Design**

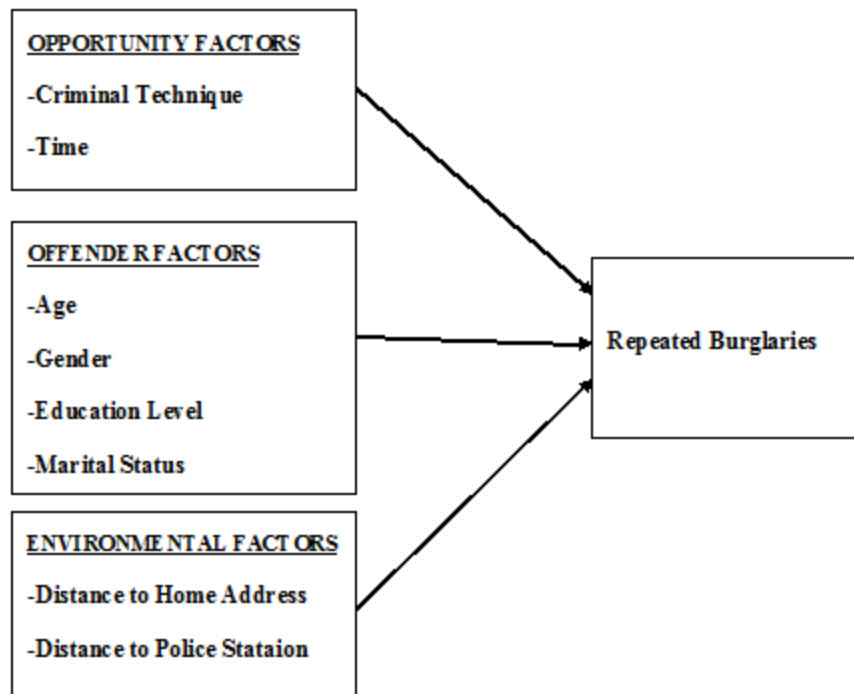
In this study, the relative influences of opportunity factors (burglary technique and time), offender factors (age, gender, marital status, and educational level), and environmental factors (distance between burglars’ home addresses and target houses, and distance between target houses and the nearest police station) on the number of burglaries and repeated burglary were examined.

For measuring the relative influence of those factors on the number of burglaries and repeat burglary, two different models were made up.



**Figure 3 Epid-criminological Model of predictors of Crime against property Crime (Burglaries)**

In the first model, the influence of opportunity factors (burglary technique and time), offender characteristics (age, gender, marital status, and educational level), and environmental factors (distance between burglars' home addresses and target houses, and distance between target houses and the nearest police station) on the number of burglaries was examined.



**Figure 4 Logistic Model of the Predictors of Repeated Burglaries**

In the second model, the influence of opportunity factors (burglary technique and time), offender characteristics (age, gender, marital status, and educational level), and environmental factors (distance of burglary home address to victims’ home address and distance of victims’ home address to the nearest police station) on the repeated burglary was examined.

Each model was examined separately by using different statistical analysis.

### **3.4. Statistical Method**

In this dissertation two different statistical methods were used to measure the relative influences of opportunity factors, offender factors, and environmental factors on the number of burglary and repeated burglary.

For the epicriminological model of predictors of crime against property Crime (Figure 1) a Hierarchical Multiple Regression was used. Hierarchical Multiple Regression is used to examine the relative effects of multiple groups of predictor variables, classified into blocks of independent variables based on conceptually defined terms, on a dependent variable (Abrams, 2002).

For the logistic model of the predictors of repeated burglaries (Figure 2), logistic regression was used. The logistic regression method allows a researcher “to test models to predict categorical outcomes with two or more categories” (Pallant, 2005, p. 160). In other words, Logistic Regression method allows a researcher to “assess how well a set of predictor variables predicts or explains a categorical dependent variable” (p. 160).

SPSS 16 Program was used to analyze the relationships among independent and dependent variables.

### **3.5. The Human Subjects**

In the BEMTAP Project, the names of the burglars and their home address were recorded. Their names and personal information were not mentioned in the dissertation and will be kept confidential. The document obtained from IRB is attached at the end of document (Appendix A).

### **3.6. Summary of Chapter**

In this dissertation, the relative influences of opportunity factors, offender factors, and environmental factors on the number of burglaries and repeated burglary were examined. For measuring the relative influence of those factors on the number of burglaries and repeat burglary,

two different models were incorporated. For the first model, epicriminological model of predictors of crime against property crime (burglary), Hierarchical Multiple Regression Analysis was used. For the second model, Logistic model of the predictors of repeated burglaries, Logistic regression Analysis was used. The data subject to the study belongs to Bursa Police Department of Public Security and Department of Juvenile Crime. The Department of Public Security classified many crime data conducive to scientific studies under a project called BEMTAP.

## CHAPTER.4.FINDINGS AND RESULTS

### 4.1. Descriptive Analysis

Descriptive analysis is performed to describe the features of the study sample and also identify if these variables meet the required assumptions for parametric statistical and multivariate analyses (Pallant, 2005). The descriptive results are presented in Table 3.

**Table 3 Descriptive Statistics for the Study Variables**

	AGE	EDU	TECH	TIME	GENDER	MARIT	DISTHOME	DISTPOL	NOBLOG	NOB
<b>N Valid</b>	829	829	829	829	829	829	829	829	829	829
<b>Missing</b>	0	0	0	0	0	0	0	0	0	0
<b>Mean</b>	2.4222	1.9819	1.4089	.6333	.8685	.4041	4.1303	3.5730	.3966	3.3848
<b>Median</b>	2.0000	2.0000	1.0000	1.0000	1.0000	.0000	5.0000	4.0000	.4771	3.0000
<b>Mode</b>	2.00	2.00	1.00	1.00	1.00	.00	5.00	5.00	.00	1.00
<b>Std. Deviation</b>	.86967	.79455	.73094	.48220	.33813	.49101	1.48581	1.38175	.33059	3.02730
<b>Skewness</b>	.936	.930	1.443	-.554	-2.185	.392	-1.334	-.390	.378	2.127
<b>Std. Error of Skewness</b>	.085	.085	.085	.085	.085	.085	.085	.085	.085	.085
<b>Kurtosis</b>	.662	.938	.417	-1.697	2.781	-1.851	.050	-1.233	-.662	5.070

	AGE	EDU	TECH	TIME	GENDER	MARIT	DISTHOME	DISTPOL	NOBLOG	NOB
<b>Std. Error of Kurtosis</b>	.170	.170	.170	.170	.170	.170	.170	.170	.170	.170
<b>Minimum</b>	1.00	1.00	1.00	.00	.00	.00	1.00	1.00	.00	1.00
<b>Maximum</b>	5.00	4.00	3.00	1.00	1.00	1.00	5.00	5.00	1.32	21.00

Study Variables:

Age: Age of burglars

Edu: Education level of burglars

Tech: Technique that is used to enter a target house by burglars

Time: Time of burglary crime

Gender: Gender of burglar

Marit: Marital Status of burglar

Disthome: Distance between the home address of burglar and target house

Distpol: Distance between target house and the nearest police station

NOBLOG: Number of burglary which is corrected by LOG transfer in SPSS

NOB: The number of burglary

Mode values of Table 3 indicate that, most of the burglars are between 18-27 years old. Burglars generally completed their elementary school education. The most prevalent techniques used by burglars were easy techniques such as entering through an open door or window, fumbling the door, and fumbling the window. Burglary crimes are generally committed in the night time. Usually single burglars commit burglary crimes. Distance between home address of burglars and target houses are generally more than 2,000 meters. Distance between target houses and police stations are more than 2,000 meters. Most of the burglars commit only one burglary crime in a three year period.



In order to use variables in parametric statistical methods, skewness and kurtosis values are important. Skewness shows a symmetric distribution of a variable, whereas kurtosis gives an idea about peakedness of the distribution (Pallant, 2005). Skewness and kurtosis values for gender were a little bit higher than normal values (-2.185 and 2.781), so they were not problematic. However, the number of burglaries was higher than normal values (Kurtosis is 5.070). Thus, log transformation was applied to this variable. It became a normal level, -.662. Other skewness and kurtosis values for other variables were between +2 and -2, which is considered to be normally distributed.

The minimum value for the dependent variable, the number of burglary, is 1 and the maximum value is 21. Since other variables were either nominal or ordinal, their minimum and maximum values were not discussed.

**Table 4 Descriptive Statistics of Offender Characteristics**

		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
<b>Age</b>	10-17	63	7.6	7.6	7.6
	18-27	482	58.1	58.1	65.7
	28-37	175	21.1	21.1	86.9
	38-47	89	10.7	10.7	97.6
	48 +	20	2.4	2.4	100.0
	Total	829	100.0	100.0	
<b>Education</b>	Not attend school	207	25.0	25.0	25.0

		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
	Elementary	492	59.3	59.3	84.3
	Middle School	68	8.2	8.2	92.5
	High School and over	62	7.5	7.5	100.0
	Total	829	100.0	100.0	
<b>Gender</b>	Male	109	13.1	13.1	13.1
	Female	720	86.9	86.9	100.0
	Total	829	100.0	100.0	
<b>Marital Status</b>	Single	494	59.6	59.6	59.6
	Married	335	40.4	40.4	100.0
	Total	829	100.0	100.0	

Study Variables:

Age: Age of burglars

Education: Education level of burglars

Gender: Gender of burglar

Marital Status: Marital Status of burglars

There are 829 valid cases in the data set. Approximately, six of ten burglars (482) were between 18 and 27 years old. Burglars between 28 and 37 years old had 175 cases (21.1%), 38 through 47 years of age had 89 cases (10.7%), and 10 through 17 years of age had 63 cases (7.6%). Burglars who were 48 and older were the smallest group with 20 cases (2.4%).

Most of the burglars (492) graduated from an elementary school (59.3%). Additionally, 207 of the 829 burglars (25%) were either illiterate or did not attend any school; 68 burglars

(8.2%) graduated from middle school; and 62 burglars (7.5%) graduated from high school, university or they have a master’s degree. Since burglars who graduated from a university or master school were very few (4), they were recorded as “4.”

Female burglars accounted for 13.1% of all burglary cases; whereas male burglars accounted for 86.9%. A majority of burglars (59.6%) were either single or divorced.

**Table 5 Descriptive Statistics for Opportunity Variables**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Tech</b>	Easy	611	73.7	73.7	73.7
	Medium	97	11.7	11.7	85.4
	Difficult	121	14.6	14.6	100.0
	Total	829	100.0	100.0	
<b>Time</b>	Day	304	36.7	36.7	36.7
	Night	525	63.3	63.3	100.0
	Total	829	100.0	100.0	

Study Variables:

Tech: Technique that is used to enter a target house by burglars

Time: Time of burglary crime

Easy techniques used to enter a target house include entering through an open door or window, fumbling the door, fumbling the window, attempting the burglary and others are the most prevalent techniques (73.7%) among burglars with 611 cases. Difficult techniques (key

fitting, breaking the door lock, breaking the door, removing the glass, and safecracking) were used relatively infrequently (14.6%), entering through roof (ceiling), climbing the wall, the balcony and vent window, and breaking the glass accounted for 11.7% of all burglary cases.

Most of burglary crimes were committed at night time (63.3%) with 525 cases whereas 36.7% of them were committed in the daytime.

Table 6 Descriptive Statistics for Environmental Factors

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>DISTHOME</b>	0-499 m	113	13.6	13.6	13.6
	500- 999 m	49	5.9	5.9	19.5
	1000- 1499 m	42	5.1	5.1	24.6
	1500- 1999 m	38	4.6	4.6	29.2
	2000 +	587	70.8	70.8	100.0
	Total	829	100.0	100.0	
<b>DISTPOL</b>	0-499 m	68	8.2	8.2	8.2
	500- 999 m	159	19.2	19.2	27.4
	1000- 1499 m	158	19.1	19.1	46.4
	1500- 1999 m	118	14.2	14.2	60.7
	2000 +	326	39.3	39.3	100.0
	Total	829	100.0	100.0	

Study Variables:

Disthome: Distance between the home address of burglar and target house

Distpol: Distance between target house and the nearest police station

Most of the home addresses of burglars (70.8%) were 2,000 meters or more away from target houses, according to the data. Some houses of burglars were located between 0 and 499

meters (13.6%), and the others were located between 500 and 999 meters (5.9%), 1000 and 1499 meters (5.1%), and 1500 and 1999 meters (4.6%), respectively.

Most of the target houses (39.3%) were 2,000 meters or more away from a police station, according to the data. Some target houses were located between 500 and 999 meters (19.2%) away from a police station, and the others were located between 1,000 and 1,499 meters (19.1%), 1,500 and 1,999 meters (14.2%), and 0 and 499 meters (8.2%), respectively.

**Table 7 Descriptive Statistics for Number of Burglaries**

		<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
<b>NOB</b>	1	252	30.4	30.4	30.4
	2	152	18.3	18.3	48.7
	3	167	20.1	20.1	68.9
	4	89	10.7	10.7	79.6
	5	33	4.0	4.0	83.6
	6	31	3.7	3.7	87.3
	7	38	4.6	4.6	91.9
	8	8	1.0	1.0	92.9
	9	18	2.2	2.2	95.1
	10	4	.5	.5	95.5
	11	1	.1	.1	95.7
	12	8	1.0	1.0	96.6

	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
14	25	3.0	3.0	99.6
16	2	.2	.2	99.9
21	1	.1	.1	100.0
Total	829	100.0	100.0	

Study Variables:

NOB: The number of burglaries

The number of burglaries varies between 1 and 21. About three-tens (30.4%) of burglars committed only one burglary crime, 18.3% committed two, and 20.1% committed three. Only one burglar committed 21 burglary crimes in three year period.

**Table 8 Correlation Coefficients of the Study Variables**

			AGE5	EDU	TECH	TIME	GENDE R	MARIT	DISTH OM5	DISTP OL5
Spearman's rho	AGE5	Coefficie	1.000							
		Sig. (2-tailed)	.							
		N	829							
EDU		Coefficie	-.014	1.000						
		Sig. (2-tailed)	.690	.						
		N	829	829						
TECH		Coefficie	.108**	.032	1.000					
		Sig. (2-tailed)	.002	.357	.					
		N	829	829	829					
TIME		Coefficie	.122**	-.010	.043	1.000				
		Sig. (2-tailed)	.000	.780	.219	.				
		N	829	829	829	829				
GENDE		Coefficie	-.138**	.269**	.080*	-.252**	1.000			



		AGE5	EDU	TECH	TIME	GENDE R	MARIT	DISTH OM5	DISTP OL5
R	Sig. (2-tailed)	.000	.000	.022	.000	.			
	N	829	829	829	829	829			
MARIT	Coefficie	.501**	-.102**	.080*	.224**	-.320**	1.000		
	Sig. (2-tailed)	.000	.003	.022	.000	.000	.		
	N	829	829	829	829	829	829		
DISTHO ME5	Coefficie	.059	-.096**	.002	-.022	.012	.029	1.000	
	Sig. (2-tailed)	.090	.006	.961	.534	.740	.406	.	
	N	829	829	829	829	829	829	829	
DISTPO L5	Correlation Coefficie	-.023	.031	-.005	-.011	-.010	-.017	-.019	1.000
	Sig. (2-tailed)	.513	.378	.891	.754	.765	.628	.592	.
	N	829	829	829	829	829	829	829	829

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

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

One of the assumptions of multiple regression is to avoid any multicollinearity or high correlated predictors. In order to test this assumption, Spearman's rho correlation test was run. The results were documented in Table 6. According to the results, there is no value over .90, which is accepted as the threshold level for determining the presence of serious multicollinearity (Pallant, 2005),

## **4.2. Hierarchical Multiple Regression Analysis**

As in all regression analyses, Hierarchical Multiple Regression is used to examine the relative effects of multiple groups of predictor variables, classified into blocks of independent variables based on conceptually defined terms, on a dependent variable (Abrams, 2002). For instance, the prediction of the frequency of burglary crimes could be made by introducing agent, host, and environment factors as predictor variables in multiple stages.

### **4.2.1. Assumptions of Hierarchical Multiple Regression Analysis**

The assumptions of multiple regression are sample size, multicollinearity, and normality, outliers, linearity, homoscedasticity, and independence of residuals (Pallant, 2005).

For calculating sample size, Tabachnick and Fidell (2001, p. 117) used the following formula:  $N > 50 + 8m$  (N is sample size and m is the number of independent variables).  $8 \times 8 + 50 = 114$ . The sample size of this study is 829, which is well above the required sample size, 114.

The second assumption is multicollinearity. The correlation table is presented in Hierarchical Multiple Regression Analysis below. There are Tolerance and VIF scores. "Tolerance is an indicator of how much of the variability of the specified independent is not

explained by the other independent variables in the model” (Pallant, 2005, p. 150). If this value is less than .10, it may be assumed that there is multicollinearity among independent variables. The opposite of Tolerance values, Variance Inflation Factors (VIF) over 10 indicate that there is a multicollinearity among independent variables (Pallant, 2005). In this table, there is no score under .10 among Tolerance scores and above 10 among VIF scores. The other indicator or multicollinearity of variables was presented in Spearman’s Rho Correlation Coefficient Test in Descriptive Analysis (Table 6). According to the results of Spearman’s Rho Correlation Coefficient Test (Table 6), all scores are below .90 which is threshold for multicollinearity assumption. In order to check normality, outliers, linearity, homoscedasticity, and independence of residuals, the most common way is by checking Normal Probability Plot and Residuals Scatterplot (Pallant, 2005).

Normal P-P Plot of Regression Standardized Residual

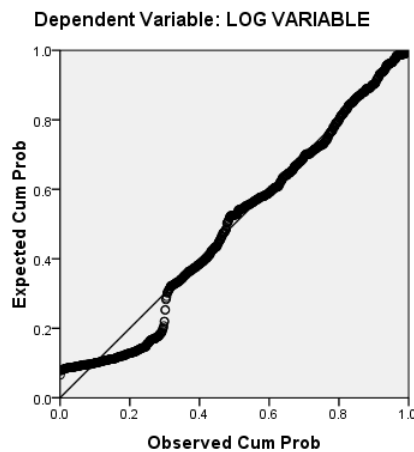


Figure 5 Normal Probability Plot

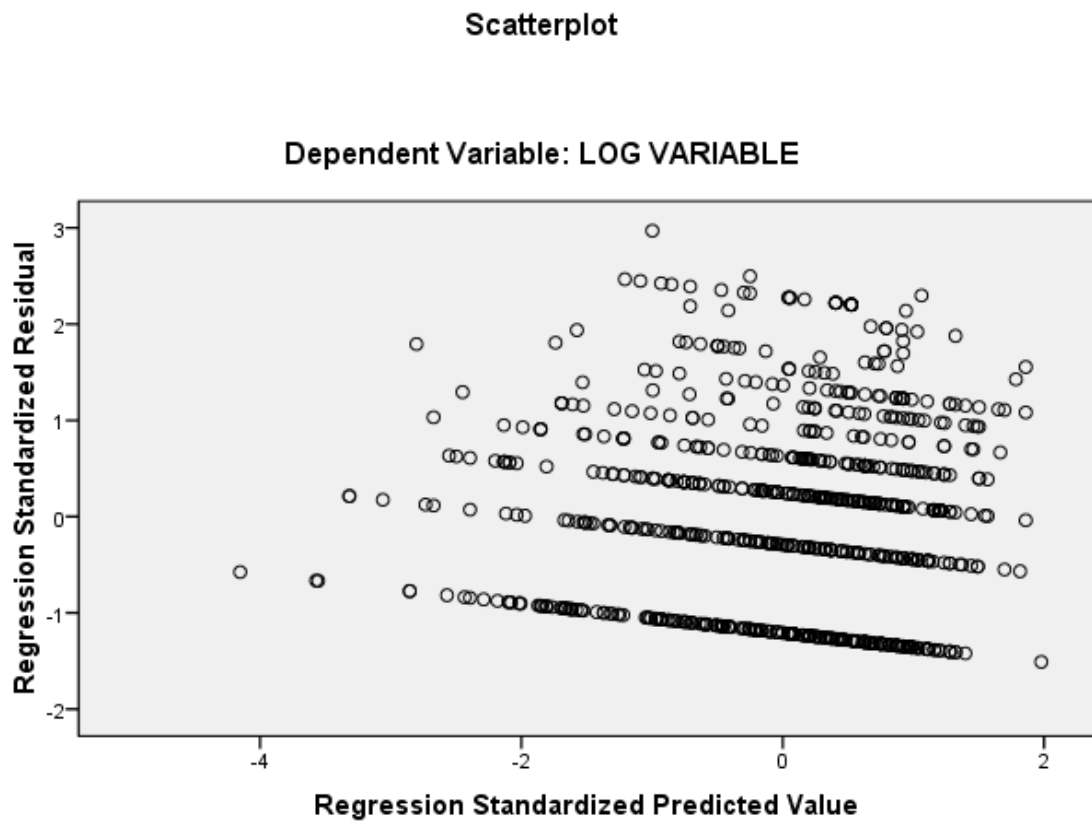
In the normal probability plot, it is expected that all points cluster around a straight line, which starts from the bottom left and reaches to the top right. This explains that there is no deviation from normality (Pallant, 2005). In Figure 5, there is a small deviation from normality close to the bottom left which can be omitted.

**Table 9 Residual Statistics of Hierarchical Multiple Regression Analysis**

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.4353	1.1409	.9132	.11509	829
Std. Predicted Value	-4.153	1.979	.000	1.000	829
Standard Error of Predicted Value	.047	.505	.076	.022	829
Adjusted Predicted Value	-.6748	1.1533	.9114	.12779	829
Residual	-1.14092	2.24617	.00000	.75247	829
Std. Residual	-1.509	2.971	.000	.995	829
Stud. Residual	-1.517	3.259	.001	1.003	829
Deleted Residual	-1.15328	3.31384	.00179	.76633	829
Stud. Deleted Residual	-1.518	3.279	.001	1.004	829
Mahal. Distance	2.256	369.006	7.990	13.128	829
Cook's Distance	.000	.954	.002	.033	829
Centered Leverage Value	.003	.446	.010	.016	829

a. Dependent Variable: LOG VARIABLE

In order to determine outliers, standardized residual values in residual statistics (Table 7) are presented. Tabachnick and Fidell (2001) argue that values that are more than +3 or less than -3 can be defined as outliers in a Residual Statistics table. In Table 7, standardized residuals are minimum -1.509 and maximum 2.971, which is expected to be normally distributed. On the other hand, outliers can be seen in the normal probability plot (Figure 6); however, they are not considered to be important in affecting the overall model fit.



**Figure 6 Residuals Scatterplot of Hierarchical Multiple Regression Analysis**

In the Residuals Scatterplot, it is expected that all points are distributed as if they make up a rectangular shape and most of the scores lie along the 0 point. Systematic patterns of residuals violate the assumptions of independence of residuals and linearity (Pallant, 2005). In Figure 2, it can be inferred that most of the points were distributed in different directions and they are close to 0 point.

It can be concluded that all assumptions were met for Hierarchical Multiple Regression Analysis.

#### **4.2.2. Hierarchical Multiple Regression Analysis**

Instead of dealing with all independent variables at the same time, hierarchical regression analysis uses a three-step approach (Abrams, 2002). In the first step, using hierarchical multiple regression, variables in blocks were entered in an order. The main rationale to use steps or blocks is that when the effect of the first block is removed, will the other blocks still have an effect on dependent variable or not? At the first stage, offender's host factors such as age, gender, marital status, and education level were put to the model. In the second step, opportunity factors such as time and burglary technique were added to the analysis. In the last step, environmental factors such as distance between home, burglars' addresses and target houses and distance between target houses and police stations, were further added to the regression. Thus, hierarchical regression analysis was performed three times, using the SPSS software. The results of the analysis are documented as follows:

**Table 10 Regression Analysis of the Predictors of the Number of Burglaries: A**

**Summary with Three Models**

Model	R	R - Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.153	.02	.01	.3274	.02	4.93		82	.00	
2	.161	.02	.01	.3274	.00	1.04		82	.35	
3	.168	.02	.01	.3274	.00	1.00		82	.36	1.42

a. Predictors: (Constant), MARIT, EDU, GENDER, AGE5  
 b. Predictors: (Constant), MARIT, EDU, GENDER, AGE5, TECH, TIME  
 c. Predictors: (Constant), MARIT, EDU, GENDER, AGE5, TECH, TIME, DISTPOL5, DISTHOME5  
 d. Dependent Variable:NOBLOG

The first thing to check is R Square values in the summary table. R Square value of offenders' host factors is .023 which means offender (host) factors explain about 2.3% of the variance in the number of burglaries committed. In order to understand the effect of other variables, R square change values are important. It is apparent that both opportunity factors and environmental factors explain an additional .2% of the total variance. Significant F change values indicate that only offender factors are statistically significant (.001). The other two groups of factors offer little explanatory power.

**Table 11 Analysis of Variance Table**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.119	4	.530	4.939	.001 <sup>a</sup>
	Residual	88.375	824	.107		
	Total	90.494	828			
2	Regression	2.343	6	.390	3.641	.001 <sup>b</sup>
	Residual	88.151	822	.107		
	Total	90.494	828			
3	Regression	2.558	8	.320	2.981	.003 <sup>c</sup>
	Residual	87.937	820	.107		
	Total	90.494	828			

a. Predictors: (Constant), MARIT, EDU, GENDER, AGE5

b. Predictors: (Constant), MARIT, EDU, GENDER, AGE5, TECH, TIME

c. Predictors: (Constant), MARIT, EDU, GENDER, AGE5, TECH, TIME, DISTPOL5, DISTHOME5

d. Dependent Variable: NOBLOG

According to Table 9, the third model, which includes offender factors, opportunity factors and environmental factors, is statistically significant since p value is under .05 (.003) which is the threshold for determining the statistical significance.



**Table 12 Regression Coefficients and Other Statistics for Each Model Containing a Specific Set of Predictor Variables**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1 (Constant)	.470	.053		8.891	.000					
AGE5	-.028	.015	-.073	-1.840	.066	-.107	-.064	-.063	.757	1.321
EDU	-.033	.015	-.079	-2.230	.026	-.058	-.077	-.077	.945	1.058
GENDER	.080	.036	.082	2.190	.029	.089	.076	.075	.855	1.170
MARIT	-.027	.028	-.040	-.980	.328	-.096	-.034	-.034	.701	1.427
2 (Constant)	.478	.058		8.282	.000					
AGE5	-.027	.015	-.070	-1.762	.078	-.107	-.061	-.061	.754	1.327
EDU	-.033	.015	-.080	-2.256	.024	-.058	-.078	-.078	.938	1.066
GENDER	.089	.037	.092	2.392	.017	.089	.083	.082	.810	1.235
MARIT	-.027	.028	-.040	-.968	.333	-.096	-.034	-.033	.686	1.459
TIME	.018	.025	.026	.727	.468	-.020	.025	.025	.902	1.108
TECH	-.021	.016	-.045	-1.300	.194	-.052	-.045	-.045	.973	1.028
3 (Constant)	.459	.072		6.330	.000					
AGE5	-.027	.015	-.072	-1.819	.069	-.107	-.063	-.063	.752	1.329
EDU	-.032	.015	-.076	-2.145	.032	-.058	-.075	-.074	.933	1.072
GENDER	.087	.037	.089	2.318	.021	.089	.081	.080	.807	1.239
MARIT	-.027	.028	-.040	-.969	.333	-.096	-.034	-.033	.686	1.459

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
TIME	.019	.025	.027	.745	.456	-.020	.026	.026	.902	1.109
TECH	-.020	.016	-.045	-1.292	.197	-.052	-.045	-.044	.973	1.028
DISTHOM E5	.010	.008	.043	1.236	.217	.047	.043	.043	.991	1.009
DISTPOL5	-.005	.008	-.023	-.659	.510	-.026	-.023	-.023	.998	1.002

a. Dependent Variable: NOBLOG

In the second step, the effect of each predictor variable on a dependent variable was examined. According to the results of analysis (Table 10), only education level (.032) and gender (.021) variables were statistically significant at .05. When beta values were taken into consideration in the final or third model, it was apparent that the gender variable (.089) contributed more than the education level (-.076). Although the age variable was not statistically significant, its beta value (-.072) indicates that it explains slightly more than the remaining five variables.

### **4.3. Logistic Regression Analysis of Repeated Burglary Crimes**

Logistic regression method allows a researcher “to test models to predict categorical outcomes with two or more categories” (Pallant, 2005, p. 160). In other words, logistic regression method allows a researcher to “assess how well a set of predictor variables predicts or explains a categorical dependent variable” (p. 160). The dependent variable, the frequency of

burglaries committed by offenders, was dichotomized into: 1) a one-time offender assigned a value of 0; and 2) repeated offenders assigned a value of 1. The agent, host, and environmental factors serve as predictor variables of this dichotomized variable.

#### **4.3.1. Assumptions of Logistic Regression Analysis**

Three assumptions of this method are sample size, multicollinearity, and outliers. Small sample size with a lot of predictors leads to problems in this method. For calculating sample size, Tabachnick and Fidell (2001) used the following formula:  $N > 50 + 8m$  (N is sample size and m is the number of independent variables).  $8 \times 8 + 50 = 114$ . The sample size of this study is 829, which is well above required sample size, 114. The second assumption is multicollinearity. It is expected that the relation between each independent variable is high, but the relations among independent variables are low (Pallant, 2005). The results of Spearman's Rho Correlation Coefficient Test in Descriptive Analysis (Table 6) indicated that all scores are below .90 which is threshold for multicollinearity assumption.

The last assumption is outliers. In order to check if there are outliers in the model or not, skewness and kurtosis scores are important. In Descriptive Statistics for the Study Variables Table (Table 1), it is clear that all scores are between -2 and +2 scores. It means that there is no outlier in the model.

It can be concluded that all assumptions were met for logistic regression analysis.

#### **4.3.2. Logistic General Model**

“Block 0: Beginning Block” is the result of a logistic regression analysis which does not include any independent variables. The results of Block 0 will be a reference for later analyses

which include independent variables as predictors of the dichotomized dependent variable (Pallant, 2005).

**Table 13 Classification Table for Block 0: Beginning Block**

			NOBDICH		Percentage Correct
			0	1	
Step 0	NOBDICH	0	0	252	.0
		1	0	577	100.0
Overall Percentage					69.6

a. Constant is included in the model.

b. The cut value is .500

The results of the classification table for Block 0, Beginning Block (Table 11), indicate that 69.6% of burglaries were classified as repeated offenders (without including independent variables). It is expected that, when independent variables are included, overall percentage of the repeated offenders could be higher. The accuracy of the prediction is examined later.

Table 14 Omnibus Tests of Model Coefficients for Block 1(Host Factors) as Predictors of the Repeated Burglaries

		Chi-square	Df	Sig.
Step 1	Step	61.026	20	.000
	Block	61.026	20	.000
	Model	61.026	20	.000

“The Omnibus Tests of Model Coefficients gives an overall indication of how well the model performs, over and above the results obtained from Block 0, with none of the predictors entered into the model” (Pallant, 2005, p. 167). This is also called as Goodness of Fit Test. The significance value of the test is expected to be less than .05 (Pallant, 2005) and the result of this study is .000 (Table 12), which is highly statistically significant. The chi-square value of the result is 61.03 with 20 degrees of freedom (Table 13).

**Table 15 Hosmer and Lemeshow Test**

Step	Chi-square	df	Sig.
1	7.424	8	.492

The Hosmer and Lemeshow test is the most reliable test of goodness of fit test in SPSS. A good result for significance should be greater than .05 (Pallant, 2005) and the significance

value of the study is .492 which is greater than the threshold. So, this value supports the result of the study. The chi-square value of the result is 7.42 with 8 degree of freedom (Table 13).

**Table 16 Model Summary of Block 1**

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	957.317 <sup>a</sup>	.071	.100

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

A summary table for the model gives basic information about usefulness of the model. Both Cox & Snell R Square values and Nagelkerke R Square values explain the variation in the dependent variable (Pallant, 2005). In this study, Cox & Snell R square value is .071 and Nagelkerke R Square value is .100 (Table 14). It means that between 7.1% and 10% of variation in the dependent variable can be explained by a set of independent variables (opportunity factors, host factors, and environmental factors).

**Table 17 Classification Table for Block 1**

		NOBDICH		Percentage Correct
		0	1	
Step 1	NOBDICH 0	44	208	17.5
	1	31	546	94.6
Overall Percentage				71.2

a. The cut value is .500

The classification table for Block 1 assists to understand how much improvement had been made after including a series of independent variables (opportunity factors, host factors, and environmental factors). The classification table for Block 1 indicates that overall percentage of predicted repeat offenders is 71.2, and that value was 69.6% for the initial classification table for Block 0 (the initial model without any predictor variables included). It means that independent variables improve the correct prediction for repeated offenders about 1.6%.

**Table 18 All Predictor Variables Included in the Equation**

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 <sup>a</sup>	AGE5	-.301	.099	9.155	1	.002	.740
	EDU	-.203	.098	4.298	1	.038	.816
	TECH	-.104	.104	.992	1	.319	.901
	TIME	.272	.167	2.645	1	.104	1.312
	GENDER	.234	.250	.880	1	.348	1.264
	MARIT	.054	.188	.084	1	.772	1.056
	DISTHOME5	.086	.050	2.942	1	.086	1.090
	DISTPOL5	-.026	.056	.222	1	.638	.974
	Constant	1.467	.480	9.332	1	.002	4.338

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 <sup>a</sup>	AGE5	-.301	.099	9.155	1	.002	.740
	EDU	-.203	.098	4.298	1	.038	.816
	TECH	-.104	.104	.992	1	.319	.901
	TIME	.272	.167	2.645	1	.104	1.312
	GENDER	.234	.250	.880	1	.348	1.264
	MARIT	.054	.188	.084	1	.772	1.056
	DISTHOME5	.086	.050	2.942	1	.086	1.090
	DISTPOL5	-.026	.056	.222	1	.638	.974
	Constant	1.467	.480	9.332	1	.002	4.338

a. Variable(s) entered on step 1: AGE5, EDU, TECH, TIME, GENDER, MARIT, DISTHOME5, DISTPOL5.

Predictor variables in the final equation model give information about contribution or relative importance of each of the predictor variables (Pallant, 2005). Table 16 indicates that age (.002) and education (.038) were the only statistically significant predictors of repeated offence. In other words, time, technique, distance between home address of burglars and target houses and distance between target houses and police stations are not significant factors to explain the repeat burglary offence.



B values in the table tell the direction of the relations among independent variables and dependent variables (Pallant, 2005). In this study, age has a negative value (-.301). It means that the younger the burglar, the more repeated burglaries will be committed. Education level has a negative value also (-.203); it means that the less educated the burglar, the more repeated burglary offences.

### 4.3.3. Logistic Model for Predictor Variables

**Table 19 Factor Matrix**

	GENERA L MODEL	OFFENDER FAC.	OPPORTUNIT Y FAC.	ENVIRONMENTA L FAC.
Overall % (Class Tab. Block 0)	69.6	69.6	69.6	69.6
Significance (Omnibus Tests of Mod. Coef.)	0	0	0.374	0.203
Significance (Hosmer and Lemeshow Test)	0.492	0.163	0.995	0.587
Cox & Snell R Square (Model Summary)	0.071	0.059	0.004	0.004
Nagelkerke R Square (Model Summary)	0.1	0.083	0.005	0.005
Overall Percentage (Class Tab. Block 1)	71.2	71.2	69.6	69.6
R Square change		0.023	0.002	0.002

According to the Table 18, overall percentage of all variables does not differ from the general model for Block 0. In Block 1, only offender factors change from 69.6% to 71.2%. It means that only offender factors caused an improvement on repeat burglary offence. Significance values of factors (Omnibus Tests of Models Coefficient) support this finding. Only opportunity factors are below the threshold level (.05). Significance values for the Hosmer and

Lemeshow Test show all factors are above threshold level (.05), which is good for a Goodness of Fit test.

Both Cox & Snell R Square values and Nagelkerke R Square values explain the variation in the dependent variable (Pallant, 2005). While Cox & Snell R Square values and Nagelkerke R Square values for offender factors are relatively high (0.059 and 0.083), those values are relatively low for opportunity factors (0.004 and 0.005) and environmental factors (0.004 and 0.005). By assessing Cox & Snell R Square values and Nagelkerke R Square values, it can be concluded that while offender factors influence repeat burglary offence 5.9% and 8.3%, the contribution of opportunity factors and environmental factors are only .4% and .5%. The R Square scores indicate nearly the same results. While offender factors influenced 2.3% change on repeat burglary offence, opportunity and environmental factors influenced only .2% change on the dependent variable (Table 18).

#### **4.4. Summary of Chapter**

The results of descriptive statistics indicated that burglars are generally single and young males who graduated from elementary school. They generally work in the nighttime and they prefer targets that are easy to enter and far from their home addresses and police stations.

Hierarchical multiple regression analysis was used to determine which factor is the most influential one to explain the variation in the number of burglaries. Statistical analysis results indicated that offender factors explain 2.3% of variation. The other two factors (opportunity and environmental factors) explained only .2% of the variation of the number of the burglary.

Logistic regression analysis was used to determine which factor is the most influential one to explain the variation in the repeated burglary offence. The analysis result indicated that, while offender factors influenced 2.3% change on the repeated burglary offence, opportunity and environmental factors influenced only .2% change on the dependent variable. To sum up, offender factors are more influential than opportunity factors and environmental factors in predicting the number of burglaries and repeated burglary offence.

## **CHAPTER.5. CONCLUSION AND DISCUSSION**

### **5.1. Conclusion**

Applying epidemiological concepts to criminology is one of the popular studies in epidemiological criminology. Scholars who draw attention to similarity between disease and crime argued that the triangle of disease etiologies can be applied to crime studies. In the quest of new knowledge on criminology of burglaries, host, agent, and environmental factors are conceived as the etiologies of burglary. By conducting an empirical study on burglaries, this research has enhanced the general understanding of the etiology of burglaries and helped take precautions against them.

In this study, the relationship of opportunity, offender and environmental factors to the frequency of burglaries and to the repeated offence (burglaries) were studied. The relative importance of predictive factors on the frequency of burglaries committed and the likelihood of committing repeated burglaries was tested. Two hypotheses are:

**H.1.** Offender factors are more influential than opportunity and environmental factors in explaining the variability in the frequency of burglaries committed.

**H.2.** Offender factors are more influential than opportunity and environmental factors in explaining the likelihood of committing repeated burglaries.

By using hierarchical regression analysis, it was found that offender, opportunity, and environmental factors explain 2.7% of variability in the frequency of burglaries committed.

Offender factors explain 2.3% variance; opportunity factors along with environmental factors explain .4% of variance in this dependent variable. So, it can be concluded that offender factors are more influential than opportunity and environmental factors in explaining the variability in the frequency of burglaries committed. As a result, the first hypothesis was accepted.

By using logistic regression analysis, it was found that the offender, opportunity, and environmental factors explain 2.7% variability of likelihood to commit repeated burglaries. While offender factors influenced 2.3% on the repeated burglary offence, opportunity factors along with environmental factors explain only .4% of the total variance in this dependent variable. So, it can be concluded that offender factors are more influential than opportunity and environmental factors in explaining the likelihood of committing repeated burglaries. So, the second hypothesis was also accepted.

Since those three factors (offender, opportunity, and environmental factors) explain very little variability on the frequency of burglaries committed and the likelihood to commit repeated burglaries, more related studies are needed in the future. The results can be applied to eastern countries since routine activities of those countries are similar to each other. Since the results are very related to life styles and life styles are continuously changing, it may not be applicable to other times.

## **5.2. Discussion of Research Hypotheses**

There are two hypotheses tested in this dissertation. One of the hypotheses is related to the frequency of burglaries committed and the other hypothesis is related to the likelihood of committing repeated burglaries. Although they were tested with different statistical methods,

they are discussed together in this final chapter because factors influencing the two dependent variables, measured in different ways in both hypotheses, are the same.

Criminology theorists indicated that offender factors were more important than other factors to explain variability in crimes. Some scholars (see Lombroso in Wolfgang, 1973) claimed that people who have physical or mental deficiencies (offender factors) are more likely to commit crimes (Wolfgang, 1973, p. 236). Individual trait theorists argued that psychological and biological (offender factors) traits of criminals are different from the others, and those different traits along with some other environmental factors were the main causes of criminal behavior (Glueck & Glueck, 1950). Feminist scholars argued that men (an offender factor) resort to crime in order to have control over women in a deviant way (Messerschmidt, 1993; Adler, 1975; Daly & Chesney-Lind, 1988). Hirschi explained people commit crime mainly with internal (e.g., self control) and external factors (e.g., social bonds) (Hirschi, 1969). Beccaria (1963) and Cornish and Clarke (1986) explained crime with rationality, which is related to economic and social status of a person (offender factors). The Productivity Commission in Australia found that offender factors (age and city residence) were more important factors than other factors (agent and environmental factors) to explain regular gambling (Productivity Commission, 1999). Anstey's argued that offender factors such as age, instability, and socioeconomic status are the most important factors to motivate a burglary offender (Anstey, 1998).

The findings of the study are very parallel with the related literature: offender factors are more influential than opportunity and environmental factors in explaining both the likelihood to commit repeated burglaries and the variability in the frequency of burglaries committed.

However, those three factors explain very little variability (2.7%) on both dependent variables. The main reason for this result may be related to the lack of pertinent variables such as occupation, income level, street accessibility, and so on. Since secondary data were used in this dissertation, it was impossible to include many more variables.

### **5.2.1. The influence of offender factors on the frequency of burglaries committed and the likelihood to commit repeated burglaries**

Among offender factors, education level (-.076) and gender (.089) variables significantly contributed to the frequency of burglaries committed as supported in the related literature. According to the descriptive analysis, 59% of burglars graduated from an elementary school and 7.5% of burglars graduated from a high school, university, or college. It was found that the lack of education is one of the main reasons for criminality (Icli et al., 2010) as well as burglary (Sagepub, 2011). High revenue-generating and respectable jobs are related to education level of people. Level of schooling may affect decision-making process of people who get involved in criminal activities such as violent crimes (Lochner & Moretti, 2004). It can be concluded that burglars who have a low level of education commit more crimes than educated people. For gender variable, it is a fact that except for prostitution, men always commit more crimes than women—especially serious crimes are under discussion (Steffensmeier & Allan, 1996). In the United States, 87% of arrested burglars in 1999 were men and the remaining 13% were women (Federal Bureau of Investigation, 2000). The findings of this study support that gender is an important factor for the frequency of burglaries committed. It can be concluded that men commit more burglary crimes than women.

Although other offender factors included in the data set such as age and marital status did not significantly contribute to the frequency of burglaries committed, it can be said that findings of the dissertation are in the same direction as suggested in the literature. When beta values are taken into consideration in regression coefficients and other statistics for each model containing a specific set of predictor variables (Appendix B), it can be seen that the age variable contributed to the frequency of burglaries committed much more than the remaining five independent variables. Its negative value (-.072) also indicates that the results have the same direction with the related literature. Since burglars commit crimes generally on foot and need to run fast in case of necessity, they are generally young people. It was suggested that younger men tend to commit cruder methods of stealing while older men prefer to commit more skillful crime. Crimes such as auto theft, burglary, robbery, and kidnapping are peculiar to young offenders while other crimes such as embezzlement, fraud, and forgery are peculiar to older men. Fox found that the mean age for burglary prisoners in United States was 30.5 (Fox, 1946) and Ratcliffe (2001) found it to be 19.5 for Australia. The other offender factor, marital status, was also insignificant for the frequency of burglaries committed. In fact, it was suggested that the breakup of a family may have traumatic effects for both parents and children. Divorcing generally leads to job inefficiency, occupational mobility, occupational detachment, and drunkenness for the couples (Lemert, 1953). It was also suggested that single and divorced adults get involved in criminal activities much more than married couples since they are less likely to be subject to social control (Felson and Cohen, 1980). Blau and Blau (1982) also claimed that separation and divorce have an important impact on adult criminality. However, the results of the study didn't support these claims. The main reason for this difference may stem from economic conditions of



countries. If economic conditions of a country are not very good, burglaries or other property crimes may be perceived as an occupation. As a result, marriage loses its importance. As a rational choice of a criminal, raising revenue gains importance. Sevim and Soyaslan conducted an interview with 72 theft and burglary suspects in Elazig (Turkey), between 2007 and 2008. According to the results of the survey, 58.3% of theft and burglary suspects stated that they stole goods because of economic problems. On the other hand, 51.4% of them had no job, 36.1% were dilutes who had no regular job (Sevim & Soyaslan, 2009).

The influence of offender factors on the likelihood to commit repeated burglaries is not so different from the influence of offender factors on the frequency of burglaries committed. In this part of the study, age (.002) and education (.038) were the only statistically significant predictors of repeated offence. According to the results, age has a negative value (-.301), which means that the younger the burglar, the more repeated burglaries are committed. Education level has a negative value also (-.203), which means that the less educated the burglar, the more repeated burglary offences. The reason why age is a significant predictor for the likelihood of committing repeated burglaries can be explained that young people generally choose burglary as a job. Older burglars may give up when they raise enough revenue from a certain burglary. Gender is not a significant predictor for the likelihood to commit repeated burglaries. That is why it may be relevant that if a woman successfully completes a burglary crime, she may choose that as a job and go on working. People and police do not suspect a woman even if they see a woman at a crime scene. Since marital status is not a significant predictor for the likelihood to

commit repeated burglaries, and is similar to the frequency of burglaries committed, it will not be discussed again.

### **5.2.2. The influence of Opportunity factors on the frequency of burglaries committed and the likelihood to commit repeated burglaries**

Two opportunity factors, criminal method (technique) and time were not significant predictors for both the frequency of burglaries committed and the likelihood to commit repeated burglaries in the results of the study. In the literature, it is easy to find that burglars generally prefer easy techniques to enter a target house. According to the British Crime Survey results in 1998 and 2000, doors and windows are the most common points of entry to the residential houses (Budd, 2001). Burglars generally enter houses by forcing the window or door (Mawby, 2006). A group of scholars found that target hardening along with defensible space is the most important precaution to prevent burglary victimization as an individual-level guardianship (Wilcox, Madensen & Tillyer, 2007). In this study, there is an inverse relation between criminal technique and the frequency of burglaries committed (-.045). It means that the results coincide with the literature; however, it is not a significant predictor for the frequency of burglaries committed. Also, criminal technique is not a significant predictor for the likelihood to commit repeated burglaries. The main reason for this result may be related to the type of houses. While some country houses have a lot of entrances other than doors, apartment houses have only one entrance and this difference may mislead the results of the study. Time was not a significant predictor for both the frequency of burglaries committed and the likelihood to commit repeated burglaries. In fact, time of the burglary is different in the results of this study and related literature. According to the data from FBI records, 445,136 burglaries are committed in the

nighttime, 818,167 in the daytime (almost double), and 332,706 could not be determined when the burglary is committed (Federal Bureau of Investigation, 2010). Sagovsky and Johnson found that more than 65% of burglaries take place in the period between 9:00 a.m. and 6:59 p.m. They interpreted the results that most people work in the daytime make their houses more vulnerable to burglary and other crimes (Sagovsky & Johnson, 2007). According to police records in Australia, most of the burglary crimes are committed in the daytime when household members generally are at work (Ratcliffe, 2001). Although it is not a statistically significant predictor, time of burglary is usually the night in Bursa for both the frequency of burglaries committed and the likelihood to commit repeated burglaries in general. The main reason for this result is that the time of the burglary is directly related with the lifestyles (or routine activities) of households (Moreto, 2010). In the United States, nearly 40% of working people who have at a job are women (Rengert and Wasilchick, 2000). However, in Turkey, only 25% of women hold a job (Turk-is Raporu, 2005). So, burglars who generally choose unoccupied houses will work in different times in eastern countries and western countries. In Turkey, they tend to commit burglary crimes in the night time when people are generally asleep and vulnerable.

### **5.2.3. The influence of Environmental factors on the frequency of burglaries committed and the likelihood to commit repeated burglaries**

Two environmental factors, distance between target houses and home addresses of burglars and distance between target houses and the nearest police stations were not significant predictors for both the frequency of burglaries committed and the likelihood to commit repeated burglaries in the results of this study. White (1932) argued that crimes against people are more

intense than crimes against property in the vicinity of the offenders' homes. While it is widely accepted that offenders generally commit crimes near their own neighborhoods, the variations of the distances are explained by complexity and type of the crimes (Brantingham and Brantingham, 1981). As an example, it was found that juveniles generally commit crimes in a two mile vicinity of their homes, and they almost never go further than six miles to commit a crime (Phillips, 1980). In this study, it was found that most of the home addresses of burglars (70.8%) were 2,000 meters away or more from target houses, according to the data. The main reason of this contradiction may be related to scattered locations in Turkey. While houses in the city center are close to each other, they are far from each other in rural areas. The second reason may be related to social cohesion. People who live in neighborhoods in Turkey have close relationships with each other and it has a repelling effect for criminals. Regarding distance between target houses and the nearest police station, it was suggested that neighborhoods where police are highly visible by residents and others bear low risk in terms of burglary (Zhang, Messner, Liu, 2007). The main reason for this suggestion was that "the increased presence of authorities, the increased likelihood of authorities being present and the increased ability of authorities to respond quickly can be considered mitigating factors resulting in a decrease of risk in an area" (Moreto, 2010, p. 3). The presence of a police station in a region reduces or prevents crimes in the surrounding area through two ways. On the one hand, police patrols and personnel continuously commute from and to the police station and that close area to the police station would always be under police surveillance. Additionally, police response to areas close to the police stations would eventually be shorter, and that would deter people from committing crimes, at least theoretically. That offenders run away before police intervention is also possible (Sun,

2000). Although it is not a significant predictor, it can be concluded that police stations have a little deterrent effect for burglars. According to the results of the study, target houses which comprise the biggest category (39.3%) were 2,000 meters or more away from a police station. The main reason for limited effect of the presence of police stations on burglar's decision making in Turkey may be related to the presence of other police units (such as traffic police unit, anti-riot police unit) in other locations. In this study, only effects of police stations were taken into consideration. Other police units were omitted and may mislead the results.

### **5.3. Implications**

Implications of identification of factors influencing the commission of burglaries are discussed under two headings: policy implications and theoretical and methodical implications.

#### **5.3.1. Policy Implications**

In light of the findings in this dissertation, it can be concluded that the best way to reduce burglar rate is to focus on identifying the offender factors. Dealing with opportunity factors and environmental factors would not contribute as much as the investigation of host factors in the commission of burglaries.

Typical law enforcement response to reduce crime rates is arresting as many criminals as possible. However, crime is not a simple issue that only law enforcement agencies can deal with. If city managers get involved in preventing crime and share responsibility, the problem may be solved more easily. This is a requirement for a modern governance understanding. In classic government style, when a city manager encounters a problem, he or she relegates it to the related public office. In parallel with the increase in personal freedoms and the development of

technology, the nature of the crimes has changed and turned to a more complex structure, as well as combating crime in a democratic way has become more challenging. In the governance style, city managers are not at the top of a hierarchy; instead, they are in the middle of a table which is composed of some other public officials and even private sector managers who are assumed as part of the solution (Salamon, 2002). While discussing possible interventions to burglary problems, wide arrays of actors to the problem were included in this dissertation.

Starting to discuss the relevant theories about crime prevention would be the most logical option among others. Cohen and Felson argued that crime occurs when a suitable target and motivated offender comes together at the same time and place in the absence of a capable guardian (Cohen & Felson, 1979). If one of the components of the crime (or preferably two) could be eliminated, a crime could be prevented. For every crime, there is an offender, target (or victim) and a place. An offender can be controlled by a handler who has detailed information about him or her like parents, friends, and teachers. Crime scenes can be taken under control by place managers such as school principals, parking attendants, and apartment managers. Targets and victims can be protected by guardians such as parents, security devices, and public officials (Clarke and Eck, 2003).

Every crime is committed in a certain place, in a certain time and by certain people. With a good data base, it will be possible to determine general inclinations of burglary and burglars and as a result of that, it would be easier to take the necessary preventive measures (Prenzler, 2009).

#### *5.3.1.1. Policy implications related to offender factors*

It was argued that police can reduce burglary rates by focusing on professional burglars only. In a police project conducted in Boggart Hill neighborhood (UK), police worked with self-sacrifice in a certain period and arrested 14 professional burglars. Besides, they warned victims to take personal precautions against burglary such as using window locks and safer doors. In a very short time, they realized that burglary rates dropped 60% in that neighborhood (Farrell, Chenery & Pease, 1998). In order to arrest more burglars, the importance of collecting concrete proof is obvious. With the collection of DNA from offenders in crime scenes, the arrest rates of offenders of property crimes are doubled (Roman, et al., 2008).

Clarke and Eck (2003) also argued that when increasing the risk of arresting criminals, it will reduce the crime rate eventually. They offered extending guardianship, assisting natural surveillance, reducing anonymity, utilizing place managers, and strengthening formal surveillance as increasing the risk factors.

If local police focus on repeat offenders, it may help reduce burglary rates in certain areas. In Oxford, England, probation officers implemented a program called Intensive Recidivist Intervention Scheme (IRIS) in order to make close surveillance on 35 repeat burglary offenders. Two years later, they realized that there was 73.6% decline in conviction rates related to burglary cases (Roberts, 2007).

One of the alternative solutions related to dealing with offender factors are training repeat offenders. Intervention programs such as conflict resolution training, parent training, and

extracurricular teaching support which are prepared for children to attend their schools have positive effects on reducing crime rates (Farrington & Welsh, 2007).

#### *5.3.1.2. Policy implications related to opportunity factors*

Clarke and Eck (2003) claimed that reducing the rewards would dissuade criminals from the targets. They offered five reducing reward techniques which are related to burglary: concealing targets, removing targets, identifying property, disrupting markets, and denying benefits. Householders hide their valuable goods like jewelry and keep their curtains closed in order not to be seen easily from the outside. It is also offered that some valuable goods, which are unprotected and stay outside, should be removed or replaced by cheaper products. Some households use microdots for their high valued items at home in order to identify their items easily (Prenzler, 2009).

As an example to measure effectiveness of target hardening, target removal, and neighborhood watch programs on burglary, the Kirkholt council estate decided to remove electronic coin meters and gas from the houses since they were targets of burglars many times. They also paid for expenditures for target hardening initiatives such as window locks. A neighborhood watch program called Cocoon Watch was also implemented in Kirkholt. According to the Cocoon Watch program, when a house is burglarized, the households around that house would be informed to take extra preventive measures. At the end of several months, burglary rates in Kirkholt dropped 75% and repeat victimization was nearly zero (Prenzler, 2009).



It is claimed that burglars prefer weekday afternoons to commit a crime since homes are generally unattended at those times. “Renting premises to community groups outside business hours” would prevent a possible burglary (Prenzler, 2009, p. 13).

#### *5.3.1.3. Policy implications related to environmental factors*

Clarke and Eck (2003) found that trees and shrubberies may prevent surveillance and block street lights. So, it is important that the surroundings of buildings or facilities be observed easily and clearly. Burglars can be deflected through reducing congestion around a building or facility. Leaving enough space around the buildings will reduce burglary by preventing entering through breaking the windows of the buildings (Prenzler, 2009).

Burglars would want to sell stolen goods to receivers. There are too many disrupting markets in a city and they prefer to sell there in order to spend less time. So, regulating the shops which sell second hand and used goods would decrease the crime rate (Clarke & Eck, 2003). Controlling receivers and second-hand dealers is another effective way to deter burglars from committing a crime. All second hand dealers should have licenses and they should easily prove how and from whom they get those goods. They should also record all serial numbers of electronics and other valuable goods (Crime and Misconduct Commission, 2009). Selling stolen goods through the internet is very common in the world today. In the United States, 18% of all stolen goods are sold through the internet annually (Palmer & Richardson, 2009). So, it is very important to track commercial websites, especially those selling used electronic items. Using an undercover police who behaves as if he is a recipient will reduce the circulation of stolen goods and it will increase the number of convicted burglars (Prenzler, 2009).

#### *5.3.1.4. Other Policy implications*

In combating burglary crime, there are some responsibilities for organized institutions such as police, government, and community managers to be involved with. Police should resort to intelligence to catch professional burglars and they should resort to crime mapping in order to determine exact time, place, and offenders. The government should initiate rehabilitation programs for drug addiction since drug addiction is a triggering factor for all crimes. The government should also subsidize security measures in deprived areas, especially. Second-hand markets should be regulated by government offices. Organizing business and neighborhoods against burglary by using crime prevention programs such as the Neighborhood Watch Program is another responsibility for government officials. The government should also determine security standards for all houses and businesses and audit them periodically (Prenzler, 2009). Eck et al., argues that all employees and managers in an apartment block or business should be included to take action against burglar (2007). First, vulnerability analysis of buildings and businesses would be completed, then countermeasures taken, and measurement of the effectiveness of countermeasure techniques should be implemented (Walsh & Healy, 1990).

Crime prevention partnership is an effective method to prevent burglary. However, in order to increase the effectiveness rate of that program, residents should be encouraged to join the program. In the project named Safer Merseyside Partnership, 178 businesses upgraded their security with the assistance of this program. While some businesses had security subsidized, the others were given free security advice and audits. The streets were lightened better and most of businesses used door and window locks. At the end of the project, there was a 59% decline in the

burglary rate in Merseyside (Bowers, 2001). It is also argued that Crime Prevention Partnership Program was useful to prevent repeat victimization. The Leicester Small Business and Crime Initiative is a good example for showing the effectiveness of that program. The Leicester Small Business and Crime Initiative started a program against repeat victimization and installed silent alarms to the houses that were recently victimized. In addition, they furnished existing alarms with CCTV. Although the program did not help to capture burglars in that area, the burglary rate declined 41% in a very short time period (Prenzler, 2009).

Clarke and Eck (2003) offered 25 situational crime prevention techniques to reduce the crime rate and 15 of them were directly relevant to burglary. They summarized those techniques under three subcategories. In the first category, they suggested that increasing the effort against crime would be a good preventive measure for burglary. Target hardening, controlling access to facilities, screening exits, deflecting offenders, and control tools are techniques that increase the fight against crime. Target hardening such as using locks, reinforced materials, and screens resulted in burglars having to exert more effort to reach their goals. Controlling access to a building or facilities and asking strangers why and where they want to go has a deterrent effect on burglars. Also, it is easy to determine if a stranger steals something or not through alarm exits (Prenzler, 2009).

An interview with burglars indicated that alarm systems in a house or business deter burglars most of the time (Cromwell, et al., 1991). The houses that do not use alarm systems are 4.57% more vulnerable to burglary than the houses that use alarm systems (Hakim & Shachmurove, 1996a). It is also argued that installing an alarm system in a house is a cost-

effective way against burglary (Hakim & Shachmurove, 1996b). However, nearly 98% of alarms are false, which is very problematic and leads to a waste of time for the police (Sampson, 2001).

Closed-circuit televisions have also a deterrence effect on burglary crime. A police CCTV system installed in Newcastle, UK, led to a 57% reduction of burglary in a certain time period (Brown, 1997). It is also claimed that when the coverage of CCTV is high and it is used in combination with other intervention methods such as often contacting police and lighting the streets well, CCTV is the best way to deter burglars in any specific place (Farrington, Gill, Waples & Argomaniz, 2007).

Property marking is another strategy to deter recipients who buy stolen goods. A project conducted in South Wales indicated that the burglary rate among participants who mark their valuables dropped 61% in a certain period of time (Laycock, 1997).

Early police intervention to crimes and severe sentences for criminals are perceived as the best way to combat with crime (Federation of Small Business, 2008). However, Bayley (1998) found that early police intervention had no effect on arrest rates, little effect on reducing damage, and does not satisfy the victims too much. On the other hand, sending more police patrols to hot spots reduces the burglary rate but it is not an economic solution (Johnson, Birks, McLaughlin, et al., 2007). More options should be taken into consideration.

### **5.3.2. Theoretical and Methodological Implications**

Applying epidemiological concepts to criminology is one of the popular studies in epidemiological criminology. Scholars who draw attention to similarities between disease and crime argued that the triangle of etiologies can be applied to crime in order to clarify if those

factors (host, agent, and environmental factors) may affect crime. By doing so, understanding crime and taking precautions against criminals would be easier. In this dissertation, the disease triangle was converted into a crime triangle and tested which factors are more important than others to explain burglary crimes. It was found that offender factors are more important than opportunity and environmental factors to explain the frequency of burglaries committed and the likelihood to commit repeated burglaries. While the crime triangle was applied to other crimes such as gambling (Tse, Abbott, Clarke, Townsend, Kingi, & Manaia, 2005) and drug use (Zinberg, 1984) in the past, it was not applied to burglary crime. This dissertation proved that the crime triangle, which is a theoretical part of Epidemiological Criminology (Schneider, 2011), is applicable to burglary crime. Combining three important theories from three different scientific disciplines is another implication for this dissertation. Epidemiological Criminology (Health Care) was a basic theory for Rational Choice Theory (Economics) and Routine Activity Theory (Criminology). Studying different theories from different disciplines give a broader perspective to the researcher.

In the light of Rational Choice theory, it is expected that burglars would probably choose closer targets to them in order to spend less effort or not to be laid under suspicion in far away neighborhoods. Traveling too far produces much more trouble for them. On the other hand, they would want to be away from police as much as possible in order not to be arrested easily. So, they will probably choose targets which are far from police units. The results of this dissertation indicated that distance to targets and police stations are not so important factors for burglars.

Using hierarchical multiple regression analysis and logistic regression analysis, the relative importance of the contributing factors was found. In past studies, there was no one who tested the influence of the three factors (offender, opportunity, and environmental factors) on both the likelihood to commit repeated burglaries and the variability in the frequency of burglaries committed in Turkey. After this dissertation, it is expected that these two methodologies will be used widely in epidemiological criminology.

#### **5.4. Contributions of the Study**

In the light of scientific studies, the importance of burglary is understood clearly by city administrators and they may take precautions against it. This study will fill an important gap in literature by analyzing real data in Bursa.

On the other hand, the relative importance of factors that influence burglary crime was not studied by scholars so far. This study focuses on determining relative importance of three factors (opportunity, offender, and environmental factors) that influence a specific crime: burglary. Determining the most influential factors will help public managers to use public sources accordingly.

In Turkey, places near police stations are perceived as safety areas. Hence, a lot of organized industry sites allocate some parts of their buildings to the local government for establishing a police station. Van Sanayi Polis Merkezi, Eskisehir Sanayi Polis Merkezi, Gaziantep Organize Sanayi Polis Merkezi, Kagithane Sanayi Polis Merkezi (Istanbul), Tire Sanayi Polis Merkez Amirligi (Izmir) are only a few examples of police stations which are located in and financed by local organized industry sites (Directorate General of Security, 2010).

However, the results of this dissertation indicated that deterrence effects of police stations (which are an environmental factor) are not so much as expected. So, when deciding to open a new police station, government officials should take into consideration that deterrence effect of police stations are limited and they cannot open a new police station only to deter criminals in a small perimeter.

The other contribution of the study is to reveal difference between eastern and western countries in terms of the time of burglary. While burglary is a crime committed in the daytime in western countries in general, this study revealed that it is not necessarily valid for eastern countries, as explained in the Routine Activity Theory.

### **5.5. Limitations**

The main limitation of this study is the relatively low level of explanation of contributing factors. Offender factors, opportunity factors, and environmental factors explained only 2.7% of both the likelihood to commit repeated burglaries and the variability in frequency of burglaries committed. In this study, offender factors were explained by four variables, opportunity factors were explained by two variables, and environmental factors were explained by two factors. In order to get better results, more pertinent variables should be included in future studies. By including more variables related to opportunity, offender, and environmental factors into the study, there would be a better likelihood of explaining burglary and repeat burglary. Since secondary data were used in the study, variables were limited by the data at hand.

The second limitation is that, it is hard to measure the deterrence effect of police stations because there may be other police buildings (traffic, patrol) in the city which can affect the decision making of criminals.

The third limitation is that, only Bursa police data were used for this study. More data belonging to other cities would better explain the variability for both burglary and repeat burglary. In this dissertation, three year data were used. Using more data covering a longer period would better explain repeat burglary offence, in particular.

The last limitation is the lack of involving interaction effect of the predictors on the number of burglaries and repeat burglaries. Both single effects of predictors and interaction effects of them must be taken into account in a research. DTREG method for decision making process would also contribute in addition to the others.

## **5.6. Future Research**

The triangle of crime etiologies is very important to identify factors influencing crime and criminality. This triangle should be applied to the studies of all crimes in order to take preventive measures against them. It was applied to drug use and gambling in the past. It can be applied to both street crimes and white collar crimes in the future.

Studying deterrence effects of police stations would be rewarding for researchers and beneficial for public administrators. Police buildings in Turkey are scattered in every city and there are too many variables to control (such as traffic unit buildings, stable police posts, patrols). So, instead of an environmental variable, deterrence effects of police stations should be addressed distinctively.



In future studies, more opportunity, offender, and environmental variables should be included to the study. For opportunity factors, the worth of the targets, target exposure, home security level, the most common stolen goods, home occupancy, accessibility to the house, potential rewards and potential punishments, visibility of the houses, convenient location, vulnerability, acquaintanceship, buildings nearby main roads, inadequate personal security measures and less informal surveillance can be included. For offender factors, ethnicity, income level, family structure (family size, family type), and occupation can be included. For environmental factors there should be two main categories included: ecological tradition characteristics (general characteristics of the residence of a neighborhood or city) and adjacent tradition characteristics (features of the adjacent neighborhoods' residents). Under those categories, social mobility, lighting of the streets, appearance of the city, land uses, household and premise characteristics, planning and design characteristics of the neighborhoods and houses, surrounding area of a house or neighborhood, rental or owned houses, houses located above shops, houses close to student hostels whose, multicultural areas, informal social control (whether neighbors watch homes), and defensible space can be included in environmental factors.

### **5.7. Summary of Chapter**

In this study, the relationship of the frequency of crimes to opportunity, offender and environmental factors and the relation of repeat offence against property (burglary) to opportunity, offender and environmental factors were studied. It was concluded that offender factors are more influential than opportunity and environmental factors in explaining the

variability in frequency of burglaries committed and the likelihood to commit repeated burglaries.

In this dissertation it was also discussed why some variables were not significant within the context of Turkey. Since those three factors (offender, opportunity, and environmental) explain very little variability on the frequency of burglaries committed and the likelihood to commit repeated burglaries, more related studies are needed in the future. Implications of identification of factors influencing the commission of burglaries are discussed under two headings: policy implications and theoretical/methodical implications.

When deciding to open a new police station, government officials should take into consideration that the deterrence effects of police stations are limited and they cannot open a new police station only for deterring criminals in a small perimeter. The second contribution of the study is to reveal differences between eastern and western countries in terms of the time of burglary. The main limitation of the study is relatively low explanatory power of the predictor variables. In order to get better results, specific host-agent-environmental variables should be included in future studies.

**APPENDIX A: IRB HUMAN SUBJECTS LETTER**

University of Central Florida Institutional Review Board  
Office of Research & Commercialization  
12201 Research Parkway, Suite 501  
Orlando, Florida 32826-3246  
Telephone: 407-823-2901, 407-882-2012 or 407-882-2276  
[www.research.ucf.edu/compliance/irb.html](http://www.research.ucf.edu/compliance/irb.html)

From : **UCF Institutional Review Board #1  
FWA00000351, IRB00001138**

To : **Mustafa Donmez**

Date : **May 11, 2011**

Dear Researcher:

On 5/11/2011 the IRB determined that the following proposed activity is not human research as defined by DHHS regulations at 45 CFR 46 or FDA regulations at 21 CFR 50/56:

Type of Review:	Not Human Research Determination
Project Title:	Identification of Factors Influencing the Commission of Burglaries
Investigator:	Mustafa Donmez
IRB ID:	SBE-11-07660
Funding Agency:	
Grant Title:	
Research ID:	N/A

University of Central Florida IRB review and approval is not required. This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are to be made and there are questions about whether these activities are research involving human subjects, please contact the IRB office to discuss the proposed changes.

On behalf of Kendra Dimond Campbell, MA, JD, UCF IRB Interim Chair, this letter is signed by:

Signature applied by Joanne Muratori on 05/11/2011 09:35:10 AM EDT



IRB Coordinator



## **APPENDIX B: TABLES**

## 1. Offender Factors

### Block 0: Beginning Block

Iteration History<sup>a,b,c</sup>

Iteration	-2 Log likelihood	Coefficients
		Constant
Step 0	1018.690	.784
	1018.343	.828
	1018.343	.828

a. Constant is included in the model.

b. Initial -2 Log Likelihood: 1018.343

c. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Classification Table<sup>a,b</sup>

Observed			Predicted		
			NOBDICH		Percent age Correct
			0	1	
Step 0	NO	0	0	25	.0
	BDICH	1	0	57	100.0
				7	
Overall Percentage					69.6

a. Constant is included in the model.

b. The cut value is .500

**Variables in the Equation**

	B	S.E.	Wald	df	Sig.	Exp. B
Step 0 Constant	.828	.076	12.0369	1	.000	2.290

**Variables not in the Equation**

Step 0 Variables	Score	df	Sig.
AGE5	42.173	4	.000
AGE5(1)	.704	1	.401
AGE5(2)	15.382	1	.000
AGE5(3)	23.668	1	.000
AGE5(4)	3.722	1	.054
EDU	10.725	3	.013
EDU(1)	.700	1	.403



	EDU(2)	2. 435	1	.1 19
	EDU(3)	6. 903	1	.0 09
1)	GENDER(	.4 10	1	.5 22
	MARIT(1)	1. 579	1	.2 09
	Overall Statistics	50 .188	9	.0 00

**Block 1: Method = Enter**

**Omnibus Tests of Model Coefficients**

	Chi-square	df	Sig.
Step 1	50.029	9	.000
Model	50.029	9	.000

**Model Summary**

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	968.314 <sup>a</sup>	.059	.083

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

**Hosmer and Lemeshow Test**

Step	Chi-square	df	Sig.
	10.474	7	.163

Classification Table<sup>a</sup>

Observed		Predicted		
		NOBDICH		Percentage Correct
		0	1	
Step 1	NOBDICH	46	206	18.3
		33	544	94.3
Overall Percentage				71.2

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp. B	95.0% C.I. for EXP(B)		
								Lower	Upper	
Step 1 <sup>a</sup>	S			35	4	.000				
	AGE5			.242						
	(1)	AGE5	-.728	.352	4.279	1	.039	.483	.242	.963
	(2)	AGE5	.078	.408	.037	1	.848	1.082	.486	2.408
	(3)	AGE5	1.503	.426	12.437	1	.000	.222	.096	.513
	(4)	AGE5	1.491	.587	6.446	1	.011	.225	.071	.712
		EDU			7.763	3	.051			
	1)	EDU(	-.392	.199	3.873	1	.049	.676	.457	.998
	2)	EDU(	.044	.347	.016	1	.899	1.045	.529	2.064
	3)	EDU(	-.734	.318	5.332	1	.021	.480	.257	.895

ER(1)	GEND	.018	.254	.005	1	.942	1.019	.619	1.677
T(1)	MARI	-.043	.193	.049	1	.824	.958	.656	1.398
ant	Const	1.771	.420	.1791	1	.000	5.877		

a. Variable(s) entered on step 1: AGE5, EDU, GENDER, MARIT.

**Casewise List<sup>b</sup>**

Case	Selected Status <sup>a</sup>	Observed	Predicted	Predicted Group	Temporary Variable	
		NO BDICH			R Resid	Z Resid
19	S	0**	.866	1	-.866	-2.544
62	S	0**	.866	1	-.866	-2.544
63	S	0**	.862	1	-.862	-2.501
18	S	0**	.862	1	-.862	-2.501
20	S	0**	.860	1	-.860	-2.478
58	S	0**	.866	1	-.866	-2.546
61	S	0**	.871	1	-.871	-2.601

a. S = Selected, U = Unselected cases, and \*\* = Misclassified cases.

b. Cases with studentized residuals greater than 2.000 are listed.

## 2.Opportunity factors

### Block 0: Beginning Block

Iteration History<sup>a,b,c</sup>

Iteration	-2 Log likelihood	Coeffi cients
		Const ant
Step 0	1018.69 0	.784
	1018.34 3	.828
	1018.34 3	.828

a. Constant is included in the model.

b. Initial -2 Log Likelihood: 1018.343

c. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

**Classification Table<sup>a,b</sup>**

Observed			Predicted		
			NOBDICH		Percent age Correct
			0	1	
0	NO	0	0	25	.0
1	BDICH	1	0	57	100.0
Overall Percentage					69.6

a. Constant is included in the model.

b. The cut value is .500

**Variables in the Equation**

		B	S.E.	Wald	df	Sig.	Exp. B
Step 0	Constant	.828	.076	12.0369	1	.000	2.290



**Variables not in the Equation**

		Score	df	Significance
Step 0 Variables	TECH	2.476	2	.290
	TECH(1)	1.678	1	.195
	TECH(2)	.474	1	.491
	TIME(1)	.767	1	.381
	Overall Statistics	3.164	3	.367

**Block 1: Method = Enter**

**Omnibus Tests of Model Coefficients**

	Chi-square	df	Sig.
Step 1	3.117	3	.374
Model	3.117	3	.374

**Model Summary**

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1015.225 <sup>a</sup>	.004	.005

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

**Hosmer and Lemeshow Test**

Step	Chi-square	df	Significance
	.070	3	.995

**Classification Table<sup>a</sup>**

Observed		Predicted		
		NOBDICH		Percentage Correct
		0	1	
Step 1	NOBDICH	0	1	
		25	57	
		2	7	
				100.0
	Overall Percentage			69.6

a. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp. p(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
Step 1 <sup>a</sup>								
TE			2.385	2	.303			
CH(1)	-.304	.231	1.728	1	.189	.738	.469	1.161
CH(2)	-.213	.215	.989	1	.320	.808	.530	1.230
ME(1)	.132	.159	.691	1	.406	1.141	.836	1.557
Constant	.815	.132	37.961	1	.000	2.259		

a. Variable(s) entered on step 1: TECH, TIME.

### Casewise list

- a. The casewise plot is not produced because no outliers were found.

### 3.Environmental factors

### Block 0: Beginning Block

Iteration History<sup>a,b,c</sup>

Iteration	-2 Log likelihood	Coefficients
		Constant
Step 0	1018.690	.784
	1018.343	.828
	1018.343	.828

a. Constant is included in the model.

b. Initial -2 Log Likelihood: 1018.343

c. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

**Classification Table<sup>a,b</sup>**

Observed		Predicted		
		NOBDICH		Percent age Correct
		0	1	
ξ	NO	0	25	.0
step 0	BDICH	0	2	
		1	57	100.0
			7	
Overall Percentage				69.6

a. Constant is included in the model.

b. The cut value is .500

**Variables in the Equation**

	B	S.E.	Wald	df	Sig.	Exp. B
Step 0 Constant	.828	.076	12.0369	1	.000	2.290

**Variables not in the Equation**

	Score	df	Sig.
Step 0 Variables in the Equation DISTHOM	2.959	1	.085
DISTPOL	.337	1	.562
Overall Statistics	3.245	2	.197

**Block 1: Method = Enter**

**Omnibus Tests of Model Coefficients**

	Chi-square	df	Sig.
Step 1	3.188	2	.203
lock	3.188	2	.203
odel	3.188	2	.203

**Model Summary**

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
	1015.154 <sup>a</sup>	.004	.005

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

**Hosmer and Lemeshow Test**



Step	Chi-square	df	Significance
	4.672	6	.587

Classification Table<sup>a</sup>

Observed		Predicted		
		NOBDICH		Percentage Correct
		0	1	
Step 1	NOBDICH	0	1	
	0	25	2	.0
	1	0	57	100.0
	Overall Percentage		7	69.6

a. The cut value is .500

**Variables in the Equation**

		B	S.E.	Wald	df	Sig.	Exp. B	95.0% C.I. for EXP(B)	
								Lower	Upper
Step 1 <sup>a</sup>	Constant	.589	.296	3.972	1	.046	1.802		
	DISTHOME5	.084	.050	2.896	1	.089	0.088	.887	1.199
	DISTPOL5	-.030	.055	.287	1	.592	.71	.872	1.082

a. Variable(s) entered on step 1: DISTHOME5, DISTPOL5.

**Casewise list**

b. The casewise plot is not produced because no outliers were found.

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