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Creating Safe Cities Through Environmental Design: Neighborhood Permeability and Burglary Rates in Diyarbakir, Turkey

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Abstract

According to Environmental Criminological perspective various factors may affect the vulnerability of a house. In terms of residentiall burglary, permeability is one of the major factors. There have been multiple studies to examine the relationship between the degree of neighborhood permeability and burglary rates. Most of the studies concluded that permeability is a mediating factor for burglary. This study derives on these condary data collected on environmental factors and burglary rates in Diyarbakir. The analysis showed that there is a significant bivariate relationship between neighborhood permeability and burglaryrates. However when number of houses introduced to the regression model, the effect of neighborhood permeability disappears. It is found that the major variable that affects both neighborhood permeability and burglary rates is the number of houses.

Keywords: Environmental Criminology, Safe Cities, Crime Prevention through Environmental Design, Neighborhood Permeability, Burglary.

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Çevresel Düzenlemelerle Güvenli Kentler Oluşturmak: Mahallelerin Geçirgenliği ve Evden Hırsızlık Oranları, Diyarbakır, Türkiye

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Öz

Çevresel Kriminoloji perspektifine göre bir evin suçlara maruz kalmasını etkileyen birçok faktör bulunmaktadır. Evden hırsızlık suçunda ise mahallelerin geçirgenliği önemli bir etkendir. Mahallelerin geçirgenliği ile evden hırsızlık suçu arasındaki ilişkiyi araştıran birçok çalışma bulunmaktadır. Bu çalışmaların birçoğu geçirgenliği bir ara değişken olarak tespit etmiştir. Bu çalışma ise Diyarbakır şehri hakkında elde edilmiş olan çevresel ve suç değişkenlerini içeren bir ikincil veri seti üzerine kurulmuştur. Analiz sonucunda, mahallelerin geçirgenliği ile evden hırsızlık suçu arasında anlamlı bir ikili ilişki bulunmuştur. Regresyon modeline ev sayısı değişkeni dâhil edildiğince ise, geçirgenlik değişkeninin etkisi ortadan kalkmaktadır. Hem geçirgenliği hem de evden hırsızlık suçunu etkileyen asıl faktörün mahallede bulunan ev sayısı olduğu ortaya çıkmıştır.

Anahtar Kelimeler: Çevresel Kriminoloji, Güvenli Kentler, Çevresel Düzenlemelerle Suçun Önlenmesi, Mahallelerin Geçirgenliği, Hırsızlık.

Introductıon

People's and media's attention on crime is essentially restricted with the extreme cases such and heinous murders, rapes and serial killers. Everyday crimes such as burglary, larceny and theft are usually not in the center of public scrutiny. However, there is a reverse relationship between the incidence of a crime and public attention; the more the incidence of a crime, the lesser the chance it will be covered. In general, violent crimes are more newsworthy than non-violent crimes, which suggests that how common is a crime that is less newsworthy (Muş, Gözübenli and Karapazarlıoğlu, 2015). Especially residential burglary seems relatively unimportant compared to violent crimes.

On the other hand, the effect of residential burglary is obvious that there is a problem which needs to be taken into account when considering the harm given to the victims and the economy of the country. In Western countries, especially in the United States, while the economic development significantly increased, so did the residential burglary rates during the 1960s and 1970s. Cohen and Felson (1979) showed that the increase in residential burglary was a combination of two changes; temptation and opportunity. Temptation had been increased by the vast raise in light-weight electronic goods such as TV's and VCR's in people's homes that could readily be sold. The opportunity to commit burglary was greatly increased as a result of far more women going out to work (Cohen and Felson 1979, Muş and Sözer, 2015). Residential burglary increased with 1960s and peaked in 1980s and stayed stable as one of the biggest crime issues in the US' agenda (Shover, 1991).

Burglary still remains as the second most common serious crime in the United States (just behind larceny-theft), accounting for 18% of all serious crime (Weisel, 2002). According to the U.S. Justice Department's Bureau of Justice Statistics (BJS), the median dollar value of items and cash stolen during completed household burglaries increased 54% from 1994 to 2011. In the same period, the median financial loss during completed burglaries in 1994 was $389 (adjusted for inflation), compared to $600 in 2011. The average dollar loss in 2011 among households that lost $1 or more was about $2,120 (BJS, 2013). Residential burglary is also one of the most widespread crimes in Australia, with around 335,700 break-ins recorded in 2010 (Australian Institute of Criminology, 2015). Australians are wary of this crime with around %36 believing their house is likely to be burgled in the forthcoming year. In European countries the situation is not different than the US and Australia. For example, burglary accounts for about 13% of all recorded crimes in the United Kingdom (Weisel, 2002). A report released by the European Commission (Eurostat, 2014) shows that 22 of 34 European

countries had an increase in residential burglary rates from 2007 to 2012. According to official data, 85.964 of 351.949 all crimes (24.4%) committed in Turkey in 2006 were burglaries (Polat and Gül, 2010). An annual report released by the Turkish Police Headquarter in 2013 only reported the crimes which had decreasing rates (Emniyet Genel Müdürlüğü, 2013: 29), in which the changes in residential burglary rates were not included. However, the residential burglary rates reported by the European Commission (Eurostat, 2014) reveal that Turkey is the third country in Europe with a 54% increase in burglaries from 2007 to 2012. Total reported burglary cases in Turkey in 2012 were about 132.000 cases, where over 90.000 were residential burglaries (Memurlar.net, 2013).

Moreover, the losses caused by the residential burglary, is reflected not only to the victims but also to the society as well. For instance, insurance costs (insurance against theft) also increase with an increase in residential burglary. Yet there will be a weakened sense of neighborhood bonding which will force people to move to other places. People start to put fences around their houses and they become detached from the neighborhood. Wealthier people also increase their personal security in spite of experiencing a kind of social disintegration (Taylor, 1995). These practices will eventually increase social fragmentation, resulting in a decline in social cohesion. Aside from the financial losses caused by the residential burglary, people who are victimized by these crimes cannot forget the emotional effects up to 12 months. Victims consider that their personal spaces were violated and they usually suffer from psychological distress, insomnia, depression and a sense of insecurity (Nicolson, 1994).

Burglary is a complex crime incorporating many components. There are numerous reasons affecting the likelihood of a house to be exposed to this crime. One of these reasons is permeability. Armitage (2004: 13), referring to the possibility of exposure to a houses' property crime, mentioned about four features. The first of these is the maintenance of the house. When the image of a house looks like an abandoned place it would attract criminals. Permeability is the second important feature. The presence of crowded places such as shopping malls in the immediate vicinity of a house would increase the possibility of committing a crime nearby. Another element is the entrance of the houses. Visibility of the front and rear entrance of a house also effects the likelihood of crimes against property. The last feature is its proximity to potential criminals where they take care of their daily routines in criminogenic places such as pubs, bus and railway stations, game halls, shopping centers, restaurants and cafes.

As a mesolevel affect, neighborhood permeability is accepted as one of the most controversial issues in crime prevention through environmental design programs. Permeability has considerable practical implications for city planning and designs (Cozens and Love, 2009). However, most of the times city planners are hesitant to make modifications in city plans, asserting that this is an issue which does not have persuasive scientific evidences (Town, 2005). On the other hand there are many studies showing that there is a statistically significant relationship between neighborhood permeability and residential burglary rates (Greenberg and Rohe, 1984; Mathews, 1992; Brooke, 2004; Taylor, 2002; Yang, 2006; Armitage, 2007; Cozens et al., 2007; Clare et al, 2009; Johnson and Bowers, 2010; Groff et al., 2014).

As it can be seen from the researches cited in the above section, there are many international studies that focused on neighborhood permeability. There are some studies focusing on environmental criminology in Turkey such as Karakaş (2004), Aliağaoğlu and Alaeddinoğlu (2005),Erman (2007), Ataç (2008), Günal and Şahinalp (2009), Aksak and Çalışkan (2010),Duru (2010), Dönmez (2011), Irmak (2011), Özkan (2013) and Bahar (2016), but this study is the first research analyzing the relationship between neighborhood permeability and residential burglary rates in Turkey.

In this study, the effect of neighborhood permeability on residential burglary rates in Diyarbakir will be examined through analyzing secondary data. The ultimate goal of this study is to provide reliable evidence for the city managers and planners whether there is a relationship between these two variables and to raise awareness about creating safer cities through environmental design.

Literature Review

Definition of Burglary

Burglary is a property crime. Under common law it was defined as “the breaking and entering the house of another in the night time, with intent to commit a felony therein, whether the felony be actually committed or not” (Payne, Oliver and Marion, 2016). Overtime this definition has been expanded and different jurisdictions criminalized various acts under this general definition (Cinoglu, 2013). For example, day time also included in this definition and also not only the house but similar places where people live such as hotels, also accepted as a place of crime.

In United Kingdom burglary is defined by the Theft Act 1968. According to the law there are two types of a burglar. A person is guilty of burglary if, (a) he enters any building or part of a building as a trespasser with intent to

steal, inflict grievous bodily harm or do unlawful damage to the building or anything in it, or (b) having entered a building or part of a building as a trespasser, he steals or attempts to steal anything in the building, or inflicts or attempts to inflict grievous bodily harm on any person in the building. As it can be seen from the definition burglary does not necessarily involve an intention to steal or the commission of theft (Monaghan, 2012). In the United States there are different local and federal jurisdictions and it is not applicable to give an exact definition of any crime, but the BJS defined burglary as an unlawful or forcible entry or attempted entry of a residence (BJS, 2015).

In the Turkish Penal Code (TPC) 2004 burglary was defined as one of the offenses against property. Article 141 of TPC states that "*any person who takes other's movable property from its place without the consent of the owner to derive benefit for himself or third parties is punished with imprisonment from one year to three years*". Different from the Common Law and the U.S. legislations, TPC by definition accepted the actual act of stealing a good as a part of burglary. On the other hand, the Article 154 of TPC also defines burglaries without stealing of any goods as part of invasion of a place. The Article 154 reads as "*any person who entirely or partially occupies immovable property or its attachments belonging to public institutions or real persons, or broadens, changes or destructs the boundaries of such places, or avoids, at a certain extent, exploitation of these immovable by the rightful parties, is punished with imprisonment from six months to three years and punitive fine up to thousand days*". These definitional differences also create a very important discussion in terms of producing reliable crime statistics. Even without including crimes listed under Article 154 of TPC, the burglary rates are already extremely higher than most of the countries. If the crimes committed under the Article 154 have also been included in the burglary rates, the overall burglary rates in Turkey might have been skyrocketed from the current numbers.

For example, TPC has made up of two volumes and the second volume has three chapters. The second chapter of the second volume is titled "offenses against individuals". This chapter has 10 sections and the 10^{th} section is titled as "offenses against property". This section consists of Articles 141 through 169 which are about crimes such as theft, robbery, burglary and bankruptcy. According to the 2012 Judicial Statistics of Criminal Courts total number of decisions rendered for accused persons is 61,371 (Adli Sicil ve İstatistik Genel Müdürlüğü, 2013). But when this total number is organized according to the TPC articles, it can be seen that 11,484 of these decisions were rendered according to Article 141 and its other complementing provisions. However, there were 4,508 more decision

rendered by the Turkish Criminal courts according to Article 154. Since Common Law and US regulations include these two different acts as a part of burglary and count them as one crime, these two different groups of decisions have to be summed up to get a better picture of burglary rates in Turkey. So, the real burglary rates of 2012 in Turkey should have increased an additional 39%.

Factors Contributing the Burglary

Using a medical perspective Dönmez (2011) stated that there are three main factors contributing the burglary. These three factors are opportunities, instruments and environmental factors. He created a hierarchical logistic regression model using different variables to construct these factors. For the environmental factors Dönmez (2011) found that the burglaries were usually committed at night times and within 2 kilometers of the burglar's house. This finding supports the general belief that, in terms of target selection, offenders select residences close to them. So, physical proximity is one of the most important factors affecting the burglary. There are also other factors such as times when burglaries occur, entry methods and burglars. But target selection is the core of analyzing burglaries from an environmental criminological perspective.

Crimes are not distributed randomly. Almost all of the crimes are related with specific times or locations (Kılıç and Demir, 2011). Offenders select a time and a place that is suitable for them and this is the reason why some places are criminogenic. So, place and time of a crime is as important as the offender (Bahar, 2009). The idea of relationship between the physical environment and crime rates can be dated back to a 19th century study titled "dangerous places". But it was the Chicago School that brought a new perspective about this relation in 1920s. Since then a considerable amount of literature has been accumulated under the title of ecological school (Dolu, 2012) or environmental criminology. One of the latest trends in environmental criminology is "Crime Prevention through Environmental Design - CPTED" (Gültekin, 2011).

CPTED is defined by Crowe (2000: 1) as "the proper design and effective use of the built environment [which] can lead to a reduction in the fear of crime and the incidence of crime, and to an improvement in the quality of life'. It involves the design and management of the physical environment to reduce the opportunities for crime and is based upon the assumption that the offender enters into a rational decision-making process before undertaking a

criminal act (Cozens and Hillier, 2008). CPTED is a place-based crime prevention strategy (Cozens et al, 2005) and it is built on four key concepts; 1) territoriality, 2) natural surveillance, 3) activity support, and 4) access control (Sohn, 2016). As Dönmez (2011) mentioned above, all of these components are the environmental factors effecting the selection of the target. So, target hardening should be increased to make the commission of a crime as difficult as possible.

Furthermore, Wiesel (2002) listed five environmental factors effecting target selection. First of these factors is the familiarity with the target, and convenience of the location. Offenders tend to commit crimes in those places where they live or spend most of their time and on the journeys in-between these places (Hodgkinson and Tilley, 2007). Houses near high-crime areas, near major thoroughfares or on the outskirts of neighborhoods are more likely to be burglarized. Victimization is also another factor, such as being previously burglarized or being close to a previously burglarized house, affecting the likelihood of being victimized. Second factor is the occupancy. Most of the times burglars do not target occupied houses. But houses without a guardian for a long time such as holidays or routinely vacant at daytimes are possible targets of burglars. The houses that appear occupied are less likely to be burglarized. Third factor is the visibility or surveillability. A burglar's risk of being seen entering or leaving a property influences target selection (Wiesel, 2002). Houses with covers, secluded houses and houses with poor lightning are more vulnerable to burglary. Fourth factor is accessibility. Accessibility determines how easily a burglar can enter a house (Wiesel, 2002). Side or back entries are the most common access point for burglars (Poyner, 2006). Houses easily entered through doors and windows. Additionally being on or close to a narrow and crowded street or alley provide limited visibility to neighbors. The last factor is the vulnerability or security. How vulnerable or secure a house is determines how likely a burglar is to target it (Karmen, 2015). Especially the houses with weakened entry points and houses whose residents are careless about security are more likely to be burglarized.

Neighborhood Permeability

Permeability basically affects peoples' ability to move around. It is described as the extent to which urban forms permit (or restrict) movement of people or vehicles in different directions (Handy, Cao and Mokhtarian, 2005). The degree of permeability is an outcome of city planning process. It arises from the arrangements of land uses, street and transportation networks, as well as natural and man-made barriers to travel (Groff et al., 2014). On the other hand, neighborhood permeability is not simply a physical design. It affects

peoples' life in various aspects. It has been linked to various aspect of life quality of a certain location. It affects peoples' everyday routines such as walking, cycling, driving and shopping. It also affects neighbors' social relations.

The degree of permeability is the major factor that has to be mentioned. Low permeability increase social control which in turn strengthen the sense of community. People tend to know each other more closely and strangers can be easily identified in these neighborhoods. High permeability on the other hand, makes relations superficial. A lot of people share the same location at the same time or just be there for a very short period. This kind of traffic makes local people to distinguish between who is living there and who is just a visitor. Places with high permeability create opportunities for criminals to move around easily and get lost within the crowd. Armitage listed three underlying mechanisms why high permeability is affecting crime rates. According to Armitage (2011) high permeability provides ease of entry and escape for potential offenders, helps offenders to stay in the location for a long time to select a suitable target and offers increased levels of anonymity for potential offenders. As Taylor (2002) summarized; the higher the degree of permeability the more the crime rates.

Essentially, almost all of the factors contributing the burglary can be explained by the physical location of the house. Certain neighborhoods tend to be more vulnerable to crimes. Specifically, neighborhood permeability is an important factor affecting the likelihood of burglaries (White, 1990). Many studies have also examined the relationship between permeability and crime. They focus geographic levels of analysis, specifically addressing street features, road networks, road types and barriers (Beavon et al, 1994; Block and Davis, 1996; Mirrlees-Black et al, 1998; Rengert and Hakim, 1998; Hakim et al, 2001; Armitage, 2007; Johnson and Bowers, 2010). These and other researches provided mixed results for the relationship between permeability and crime. Even though there is not a very strong consensus over the affect of degree of permeability on crime, it still proves central to this debate.

Method of the Research & Data Analysis

A quantitative approach is used to analyze the relationship between neighborhood permeability and burglary rates. It is difficult to measure a correlational relationship between two variables using a qualitative approach. If the variables can be operationalized accurately, then measuring the hypothesized relationship could be easier in a quantitative design.

The basic question driving this research is to understand the environmental factors that might affect the crime rates. This question is an important topic in environmental criminology and further field researches have to be conducted to analyze this problem. In this study, one of the main aspects of the physical characteristic of neighborhoods, which is neighborhood permeability, is studied from an environmental criminological perspective. The hypothesis of this research is to see whether the burglary rates in Diyarbakir neighborhoods statistically differentiate between each other based on the degree of permeability. In other words, do burglary rates increase as the neighborhood permeability increases? The researchers assumed a positive relationship between these two variables.

Secondary data, collected from different sources is used in this research. The independent variable of the research model is neighborhood permeability and the dependent variable is the burglary rates. To measure the neighborhood permeability, entry points of each neighborhood was recorded. The neighborhood police stations' administrative maps were used to count the number of entries of each street. Number of burglary cases was used to measure the dependent variable. The burglary rates of 2011 were taken from the Diyarbakir Police Directorate. Furthermore, population density measured in number of people living in a neighborhood and number of households in that neighborhood used as control variables. Both of these data were taken from the Turkish Statistical Institution's databases.

Data Analysis

The data collected for this research was analyzed with SPSS 15. 42 neighborhoods in Diyarbakir city center are included to the analysis. The values of the research variables used in this study are listed in Table 1.

Table 1: The number of entry points, burglary rates, population and number of households of 42 neighborhoods in Diyarbakir, 2011.

	Neighborhood	Number of Entries	Number of Houses	Population	Number of Burglaries
1	Yenişehir	19	6681	25976	64
2	Kooperatifler	12	10769	36994	193
3	Dicle	10	827	3876	4
4	FeritKöşk	12	816	3988	0
5	Cumhuriyet	15	1202	6313	5
6	Gürdoğan	20	1861	9427	22
7	Aziziye	19	3919	15223	67
8	Yolaltı	16	1803	6662	32
9	Seyrantepe	41	619	2621	2
10	Fabrika	16	2283	7781	4
11	Üçkuyu	15	3034	6690	23
12	Şehitlik	24	11719	52969	96
13	Ali Paşa	22	1127	5743	1
14	AbdalDede	9	246	1269	2
15	Lalebey	19	942	4954	4
16	ZiyaGökalp	21	889	4466	6
17	S. Nazif	7	151	723	1
18	M. Ahmet	20	1740	8706	9
19	İskenderPaşa	21	1796	8294	19
20	CamiiKebir	11	369	1898	3
21	CamiiNebi	19	639	2954	1
22	CevatPaşa	13	1038	4518	5
23	Dabanoğlu	20	1048	4652	1
24	Hasırlı	19	1518	8553	3
25	Fatihpaşa	18	1572	7952	2
26	Savaş	24	699	3425	4
27	C. Yılmaz	14	456	2843	1
28	Huzur	40	19314	79484	218
29	Peyas	65	28131	111178	323
30	Barış	3	1742	3992	10
31	S. Eyyubi	11	4926	20892	79
32	M. Halit	63	11516	55545	139
33	ŞeyhŞamil	55	8452	47056	84
34	5 Nisan	69	12569	64547	144
35	Kaynartepe	58	7909	34822	82
36	Muradiye	30	2786	11884	30
37	Fatih	33	5021	24202	77
38	Körhat	14	3030	11387	16
39	Bağcılar	33	5511	18405	92
40	YeniKöy	11	1464	7848	2
41	YunusEmre	22	3882	19776	34
42	Ali Pınar	5	1049	4560	8

The descriptive statistics and the result of normality tests of the research variables are presented in Table 2.

Table 2: Descriptive statistics and normality test of the research variables.

	Mean	Std. Deviation	Skewness	Kurtosis	Kolmogorov-Smirnov
Number of Burglaries	45,52	69,752	2,277 (,365)	5,769 (,717)	0,257 (p = 0,000)
Number of Entries	23,52	16,550	1,531 (,365)	1,603 (,717)	0,251 (p = 0,000)
Number of Houses	4215,83	5664,864	2,552 (,365)	7,601 (,717)	0,249 (p = 0,000)
Population	18215,43	23876,703	2,255 (,365)	5,333 (,717)	0,271 (p = 0,000)

Note: Standard errors of Skewness statistics and Kurtosis statistics are shown in parenthesis.

As it can be seen from Table 2, according to results of Kolmogorov - Smirnov normality test neither of the research variables has normal distribution. The Skewness statistics show that all of these variables are positively skewed. In order to normalize these positively skewed variables, a log transformation is conducted. But one of the neighborhoods in Diyarbakir (*Ferit Köşk Mahallesi*) had no burglary cases in 2011. So, to be able to get a valid value at the end of the log transformation "*ln(y+1)*" is used to compute the burglary cases variable. After the log transformation the Kolmogorov-Smirnov (K-S) test of normality values also confirmed that the research variables with the logged values showing number of burglaries ($K\text{-}S_{(41)}$ = 130, p = 0,078), number of entries ($K\text{-}S_{(41)}$ = 129, p = 0,086), number of houses ($K\text{-}S_{(41)}$ = 112, p = 0,200) and population ($K\text{-}S_{(41)}$ = 119, p = 0,150) are normally distributed. The logged variables are used in the following analysis.

To examine the bivariate relationship between the research variables a correlation analysis is run. The logged values are used in this analysis and the result of the correlation analysis is shown in Table 3.

Table 3: Bivariate correlation matrix of the logged values of research variables.

		(1)	(2)	(3)	(4)
Number of Burglaries (1)	Pearson Correlation	1			
	Sig. (2-tailed)				
Number of Entries (2)	Pearson Correlation	,524**	1		
	Sig. (2-tailed)	,000			
Number of Houses (3)	Pearson Correlation	,911**	,598**	1	
	Sig. (2-tailed)	,000	,000		
Population (4)	Pearson Correlation	,888**	,662**	,985**	1
	Sig. (2-tailed)	,000	,000	,000	

N = 42

** Correlation is significant at the 0,01 level.

The above table obviously shows that number of burglaries in a neighborhood is strongly affected by each of the predicting factor. Number of houses (Pearson Correlation = 0,911, p = 0,000) and population (Pearson Correlation = 0,888, p = 0,000) variables are strongly and positively affecting the number of burglary cases in a neighborhood. Number of entries (Pearson Correlation = 0,524, p = 0,000) has also a moderately strong and positive effect on burglary rates. There is also statistically significant and positive relationship between predicting variables of the burglary rates.

A linear multiple regression analysis would be computed using all of the predicting variables simultaneously in a model. But the effects of the predicting variables on the burglary rates would highly likely to be spurious because of the multicolliniaerity problem. Bivariate correlation matrix in Table 3 also shows that "population" is very strongly and positively correlated with "number of houses". Additionally, the "population" Pearson Correlation statistic (0,662) is higher than the "number of houses" Pearson Correlation statistic (0,598) with "number of entries". With these results in hand, even though the "population" variable will be included in the first multiple regression model, it will not be included in the second multiple regression model because of multicollinearity problem. By creating two multiple regression models, the separate effects of predicting variables other than the neighborhood permeability will be effectively controlled. The results of the regression analysis for three models are presented in Table 4 and Table 5.

Table 4: Regression model summaries of the logged values of the research variables.

Models	R	R Square	Adjusted R Square	Std. Error of the Estimate
1[a]	,524[b]	,274	,256	1,39661
2[a]	,912[c]	,832	,819	,68881
3[a]	,911[d]	,830	,822	,68374

a. Dependent Variable: Ln (Burglary rates+1)

b. Predictors: (Constant), Ln Number of Entries

c. Predictors: (Constant), Ln Population, Ln Number of Entries, Ln Number of houses

d. Predictors: (Constant), Ln Number of Entries, Ln Number of houses

According to ANOVA analysis Model 1 ($F_{(1)}$ = 15,107, p = 0,000), Model 2 ($F_{(3)}$ = 62,850, p = 0,000) and Model 3 ($F_{(2)}$ = 95,459, p = 0,000) can significantly predict the burglary rates. Model 1 is the base model and it has only one predicting variable, which is the logged number of entries. Neighborhood permeability is the main factor that this study is set to explain and number of entries to the neighborhoods is the basic independent variable that measures neighborhood permeability. Even though the correlation matrix revealed a statistically significant positive and moderate strong relationship between neighborhood permeability and burglary rates, creating a linear simple regression model is necessary to explain the predicting capacity of neighborhood permeability on the variation of burglary rates.

Model 1 with one predictor revealed that 25,6% of the variation in burglary rates can be explained by degree of neighborhood permeability alone. On the other hand when the "number of houses" and "population" variables are introduced to the model as control variables, the variation explanatory capacity of Model 2 rises up to 81,9%. But the multicollinearity problem revealed in the correlation matrix related with the very high correlation between "number of houses" and "population" variables is also confirmed by the variance inflation factor (VIF) values in Table 5. The VIF values of both variables are greater than 40, which is extremely higher than the threshold value of 10. So, a final model is created excluding the "population" variable from Model 2. This time Model 3 has two predicting variables, which are "number of entries" and "number of houses". These two independent variables can explain 82,2% of the variance in burglary rates.

Table 5: Coefficients of the regression models.

Models	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1							
(Constant)	-1,054	0,991		-1,064	0,294		
Ln number of entries	1,276	0,328	0,524	3,887	0	1	1
2							
(Constant)	-5,965	1,328		-4,491	0		
Ln number of entries	0,001	0,237	0,001	0,006	0,995	0,465	2,153
Ln number of houses	1,624	0,569	1,2	2,855	0,007	0,025	40,042
Ln Population	-0,413	0,63	-0,294	-0,655	0,517	0,022	45,809
3							
(Constant)	-6,703	0,696		-9,627	0		
Ln number of entries	-0,08	0,2	-0,033	-0,401	0,691	0,642	1,557
Ln number of houses	1,259	0,111	0,931	11,309	0	0,642	1,557

On the other hand, according to Table 5, while neighborhood permeability measured by the "number of entries" was significantly explaining the variance in burglary rates in Model 1 (t = 3,887, p = 0,000), with the introduction of "number of houses" and "population" variables to the model, the effect of neighborhood permeability disappeared in Model 2 (t = 0,006, p = 0,995). Even though the "population" variable was excluded from Model 2, neighborhood permeability still did not have a significant effect on burglary rates when having the "number of houses" as an additional predictor in Model 3 (t = -0,401, p = 0,691).

Finally, to see the stand-alone explanatory power of "number of houses" on the burglary rates and additional simple regression model is produced with only one predictor. The results of the ANOVA and the regression analysis showed that the "number of houses" can significantly explain 82,5% of the variation in burglary rates (R = 0,83, R^2 = 0,825, $F_{(1)}$ = 194,846, p = 0,000). Based on the findings of this research it is possible to say that there is almost

a positive perfect correlation between number of houses and burglary rates (Pearson Correlation = 0,991 and $\beta = 0,911$).

Discussion and Conclusion

Environmental criminology asserts that city planning has a vital affect on crime rates. It is possible to prevent crimes to a certain degree through environmental designs consistent with the principles of creating safe cities. City managers and city planners work for to build an organized city through arranging streets, parks, and business and residential areas. Scientific evidences from various researches also show that material part of culture affects social dynamics. It is not possible to think about peoples' social and psychological states without the effects of the environment. To pursue a happy and healthy life, people need safe and clean cities. However, for the sake of making more profits, basic principles of designing a safe city is ignored most of the times. On the other hand, not making more profits but increasing the residents' quality of life should be the priority of the city managers and city planners.

This study was designed to test the hypothesis stating that neighborhood permeability would have a significant effect on burglary rates. Even though a moderate positive correlation was observed between the two variables and a statistically significant effect was found as a result of the simple regression model, the multiple regression model with the introduction of number of houses made the effect of neighborhood permeability disappear. According to the findings we failed to reject the null hypothesis. So, based on the findings it is possible to conclude that neighborhood permeability does not have a significant effect on burglary rates when controlled for the number of houses in a neighborhood.

On the other hand, this research also supported the idea that city planning has a statistically significant effect on burglary rates. Even though the research started with a hypothesis set to explain the affect of neighborhood permeability on burglary rates, it became obvious that another aspect of city planning had almost a perfect relationship with burglary rates. Number of houses is the main predictor of burglary rates in a neighborhood. This factor is the result of organization of residential areas. Allowing high rise buildings with multiple apartments creates a suitable environment for the possible offenders. These areas create opportunities for the burglars to determine a suitable target without being noticed because of a crowded population.

Moreover, the separation of residential and business areas has also an indirect effect on burglary rates. The ongoing frenzy of building enormous

shopping malls in the residential areas are intensely increasing the number of people visiting that specific place who are not living in that neighborhood. This frenzy has lately stepped up a notch and the current trend is to build shopping malls with residences attached to them. By this way, the city managers allow to build not only commercial entities in residential areas, but also more houses in neighborhoods which are already over-crowded.

In such an environment the security precautions are most of the times left to the individuals. Residents who are living in apartment blocks in highly populated neighborhoods of the cities should take personal safety measures such as installing burglar alarms, securing entry points (windows and unit doors), installing closed circuit TV systems to their buildings, improving visibility of the entrances and increasing outdoor lightning. Creating social bonds with the neighbors and watching one another's apartment for possible break and entries is also another important precaution.

More studies with a micro approach are needed to analyze the relationship between neighborhood permeability and burglary rates. The data set used in this study was collected from a metropolitan city. The whole part of the city is included in this research. The unit of analysis is the neighborhood; because of this a macro approach is used to see the big picture. On the other hand, moving the focus of the research design from the neighborhood level to the street level may produce a more detailed picture of the effect of permeability on burglary rates. Changing the unit of analysis from the neighborhood to street can give a better understanding of burglary rates in neighborhoods where there are predominantly single-family houses instead of apartment blocks. This reorganization will also help to clearly separate residential and commercial areas. By this way, it would be possible to control for the effects of number of houses and population in sparsely populated residential neighborhoods.

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