

# Explaining Victims in Slovenia - Vulnerability and Attractiveness of Crime Victims

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## Abstract

In the paper the nature and the characteristics of the Slovenian victims of the crime concerning both household and individual is discussed. It is examined which are characteristics of a crime's victim: personal (e.g., age and sex), social (e.g., environmental, occupational, human relational), and situational characteristics (e.g., time, place, conflict).

The logistic regression to explain forms of victimization is used. The analysis is based on the International Victim Survey, conducted in September 1992 in Ljubljana by Institute of Criminology, and by the Center of Methodology and Informatics at the Faculty of Social Sciences.

## 1 Introduction

The goal of this paper is to explain vulnerability and attractiveness of crime victims with factors known in victimology that were examined with logistic regression. Therefore we briefly considered theoretical issues and presumptions about victimization. Furthermore we described proposed logit approach and applied it to analyze the main form of victimization. At the end we drew some conclusion.

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## **2 Theoretical issues and presumptions**

### **2.1 Concept of victimization**

Since we have analyzed victimization in Slovenia, we ought explain first the concept of victimization. Unfortunately, some general definition of victimization does not exist. Concept of victimization is also questionable because of variety of types, forms and levels of victimization. The heterogenousness of victimization is reflected in great number of victimization typologies and classifications (Fattah, 1991: 5-18). We focused our analysis on criminal victimization, more precisely, on primary type (victimization is a result of crime events and victim is physical subject, in our case household or its member).

### **2.2 Measuring victimization**

We can record victimization in two different ways; first, with official statistics, such as police and hospital records, and second, by estimating victimization through victim surveys. Victim surveys are often used as an alternative and also as a complement to official statistics. These two data sources of victimization should not be used primarily to produce comparable estimates of the crime level and trend (Lynch, 1992). Both ways capture very different information on the crime events included in each. Official statistics are much better to estimate the level of violence that results in very serious injury, and victim surveys are the best sources of information on property crimes and trivial forms of personal crimes (Lynch, 1992). However useful and feasible complements to official statistics victim surveys are, their limits for measurement of victimization risk must be recognized (Walklate, 1989; Block, 1992; Kury, 1992; Lynch, 1992).

### **2.3 Concept of victim**

Victim is the basic notion in victimization. Law denotes victim as physical or legal subject, which could be specified (state, corporation, association, etc.) or unspecified (for example public order, religion, etc.) (Separović, 1973). How is the concept of victim defined in victimology or criminology? Authors use term victim in different ways, for example as characteristic, stereotype, further as condition, social status or rule or as legal note (see Fattah, 1992).

Everyone can become a victim, but on the other hand the risk for victimization is not the same for everybody. Many characteristics in someone's life are important for victimization (Separović, 1973):

- personal characteristics: biological (sex, gender, etc.) and psychical (aggressiveness, alienation, carelessness, etc.) characteristics,
- social characteristics (environmental, occupational, human relations, etc.),
- situational characteristics (time, place, conflicts, etc.).

## 2.4 Research hypotheses about victimization

Our hypotheses base on attainable theoretical and empirical victim surveys and analyses. We formulated several presumptions, first for household property victimization and second for personal crimes.

### *Household property victimization*

1. Probability for household property victimization decreases with number of household members.
2. Probability for household property victimization decreases with solid social network.
3. Probability for household property victimization increases with bad prevention for own property.
4. Probability for household victimization increases with amount of income.
5. Probability for household victimization is greater if household members live in the apartment in the city center, and lower if they live in the house in the edge of the city.

### *Personal victimization*

1. Probability for personal victimization decreases with age.
2. Probability for personal victimization is greater for male, specially if male is single.
3. Probability for personal victimization is greater for member in household, who lives in the better city district than for member, who lives in the 'dangerous' district.
4. Probability for personal victimization is lower for the pearson, who is afraid, because he would take actions for his own protection, than for one who lives carelessly.
5. Probability for personal victimization decreases with the solid social network.

We verified presumptions for household property and personal victimization with data, collected by International Victim Survey in September 1992 in Ljubljana by Institute of Criminology, and by Center of Methodology and

Informatics at the Faculty of Social Sciences (Pavlović, 1992; Ferligoj et.al., 1992).

### **3 Empirical analysis**

#### **3.1 Description of the sample**

Target populations of the International Victim Survey in Slovenia conducted in September 1992 were adult inhabitants of Ljubljana, the capital of Republic of Slovenia (persons older than 16 years). Sample is dual and its size is 1000 units (households): 700 units were interviewed by phone (CATI) and 300 units by face-to-face (CAPI). Every household had the same probability to be chosen, as we used random sampling. A unit of survey is a person, older than 16 years, who had first birthday within chosen household (next birthday method). For CATI and CAPI computers were used, with identical software for data collection (BLAISE 2.3).

#### **3.2 Description of variables**

Slovenian victim survey was a part of international victim survey, which measured the rate of crime or the processes connected with crime. Respondents were asked whether they had been victimized in last five years (1987-1992). The questionnaire covered 12 main forms of victimization:

a) household property victimization

- theft of car
- theft from car
- vandalism
- theft of motorcycle
- theft of bicycle
- burglary with entry
- attempted burglary
- burglary in garage, porch, etc.

b) personal victimization

- robbery
- personal property theft
- sexual incidents (women only)
- assaultive offence.

Statistical unit for household property victimization was household, and for personal victimization was an individual, member of a chosen household. Therefore we examined the relationship between dichotomous dependent variable, in our case particular form of victimization, and factors that could determine the particular form of victimization in two models. In the first model we wanted to explain specific forms of household property victimization with following factors (independent variables):

- number of members in household
- income of household
- district of residence
- status of residence
- type of residence
- prevention
- social network.

In the second model, personal victimization model, we explained particular form with following independent variables:

- sex
- age
- education
- marital status
- district of residence
- status of residence
- type of residence
- social network
- fear of crime.

We ought to say that prevention, social network and fear of crime were indexes created just for the purpose of explaining the vulnerability and the attractiveness of crime victims (see Kolenc, 1993: 30-32).

### **3.3 Logistic regression**

The goal of our analysis was to explain 'rare' dichotomous dependent variable with selected independent variables. To reach this goal several statistical methods could be used. For example: non-linear probability models including logistic regression (logit), log linear models, discriminant analysis, etc.

Using log linear models to explain 'rare' dichotomous dependent variable, we would have to cope with too low theoretical frequencies in contingency tables (empty cells) due to asymmetric distribution. Discriminant analysis is not classic statistical tool for explaining such type of variables. Its basic task is to find the direction in space where the discrimination reaches the highest level. In our case logit approach has the best properties. Therefore, this method was chosen to examine the main characteristics of the Slovenian victim.

The basic characteristics of the logit model is that the choice probability for particular attributive characteristic is a linear function of individual values of one or more independent variables (Hadživuković, 1982: 220, Aldrich and Nelson, 1989).

In logit we directly estimate the probability of victimization event occurring. For the case of more than one independent variable the model can be written as

$$P(Y_i = 1) = \frac{1}{1 + e^{-Z_i}} = P_i$$

where  $Z_i$  is a linear combination

$$Z_i = \sum b_k X_{ik}$$

where  $k, k=0, \dots, m$ , is number of variables and  $i, i=1, \dots, N$ , is number of units.

The probability of victimization event not occurring is estimated as

$$P(Y_i = 0) = 1 - P_i.$$

We measure dependent and independent variables, so all we need is to estimate the parameters  $b_k$ . Logit estimates the parameters  $b_k$  by method called Maximum Likelihood Estimation (MLE) (Aldrich et al., 1989: 49-52). The principle of MLE is to choose as an estimate of  $b_k$ , which would make the likelihood of having observed this particular  $Y$  as large as possible. In particular, each 'trial value' of  $b_k$  will yield a value of  $L(Y/X, b)$ . We take as the MLE estimate the particular value for  $b_k$  which yields the largest value:

$$L(Y/X, b) = \max_b L(Y/X, b)$$

where is

$$L(Y / X, b) = \prod_{i=1}^N \left[ \frac{\exp(\sum b_k X_{ik})}{1 + \exp(\sum b_k X_{ik})} \right]^{y_i} \left[ \frac{1}{1 + \exp(\sum b_k X_{ik})} \right]^{1-y_i}$$

where  $k=0, \dots, m$ .

Parameters  $b_k$  determine the direction of effect. Effect of independent variable increases with larger value of the parameter. Logistic regression has several statistics and coefficients for testing logistic parameters and fit of the whole model (Aldrich and Nelson, 1989: 54-61):

1. Individual coefficient estimates:
  - t-statistic
  - confidence interval
2. Goodness of fit:
  - likelihood ratio statistic
  - pseudo  $R^2$
3. Joint hypothesis test for subset of coefficient.

Several coefficient and statistics in a different metrics (odds, ln odds, odds ratios, ln odds ratios and probability) have been suggested as an adjunct to the basic logistic regression coefficient (Morgan and Teachman, 1988; Long, 1987; Petersen, 1985). But until now, very little consideration has been given to a standardized logistic regression coefficient (Kaufman, 1992). Kaufman (1992) has developed and proposed two standardized coefficients appropriate for dichotomous logistic regression:

1. semi-standardized coefficient
  - in a ln odds matrix and
  - in a probability matrix
2. fully standardized coefficient.

So far standardized logistic regression measures have not been integrated in the statistical computer programs, although the effects of different independent variables can be compared only when standardized measures are used.

Statistical software SPSSPC V4.0 was used. Because of the comparability of our results with the results of other victim surveys (see Kolenc, 1993: 20-25), we included all variables in the model (ENTER method).

### 3.4 Results

#### 3.4.1 Basic statistics

In Table 1 frequencies of chosen victimization forms are reported. We can see that all victimization forms household property and personal victimization types are rare, even for the 5 years period.

Table 1: Frequence and prevalence rates for 5 years period

form of victimization	frequency	%	% owners
theft of car	12	1.2	1.5
theft from car	193	19.3	24.6
vandalism	271	27.1	34.7
theft of motorcycle	27	2.7	13.2
theft of bicycle	144	14.4	18.3
burglary	72	7.2	
attempted burglary	85	8.5	
burglary in garage, etc.	97	9.7	
robbery	16	1.6	
sexual incidents	55	5.5	9.8
assaults	85	8.5	
personal theft	136	13.6	

We also calculated T and chi-square statistics to analyze the relation between independent variables and specific forms of victimization (see Kolenc, 1993: 53-59). Household victim and no-victim in average differ in next variables: social network, income and prevention. We have also established the importance of type and district of residence for household property victimization. Age and marital status determine the personal victimization, which was not found true in the robbery case. This was established by the results of hi-square and T- statistics, but the results of logit approach were slightly different.

#### 3.4.2 Logistic regression results

The basic problem was how well logistic model performed. SPSSPC V4.0 has many statistics to determine this. One is known as the likelihood of the observed results. Since the likelihood is a small number less than 1, it is customary to use -2 times the log likelihood as a measure of how well the estimated model fits the data. A good model is the one that results in a small value for -2 Log Likelihood. If model fits perfectly -2 Log Likelihood is 0. -2 Log Likelihood has a chi-square distribution with N-m degrees of freedom, where N is number of units (cases) and m is the number of parameters estimated. Another statistic that could be used to



test how well the model fits is goodness-of-fit statistic. It compares the observed probabilities to those predicted by the model.

The goodness-of-fit statistic is defined as

$$Z^2 = \sum \frac{\text{Residual}_i^2}{P_i(1-P_i)}$$

where the residual is the difference between the observed value,  $Y_i$  and the predicted value,  $P_i$ . This statistic has a chi-square distribution with approximately  $N-m$  degrees of freedom. The large observed significance level indicates that this model does not differ significantly from 'perfect' model.

And here are the results of logistic regression for household property and personal victimization.

### *Household property victimization*

The best indicators for household property victimization are income, status of residence, prevention and social network. In spite of rare events (low frequencies), all models fitted well, with one exception - logit model for theft of car. Results of motor vehicle victimization showed that the crime is present where there are the goods that create opportunities (Pavlović, 1992). 'Other burglary' was the most determined with observed factors and the least the vandalism of car.

Table 2: Logistic regression for household property victimization

	Theft of car	Theft from car	Vandal.	Theft of motor.	Theft of bicycle	Burglary	Attempt. burglary	Other burglar.
nr. household memb.								*
income		**				*	*	
district of residence				**				
status of residence		***		*				***
type of residence								**
prevention							**	*
social network					*	*		***
-2 Log Likelihood	114.18	804.46	947.55	139.67	682.09	460.03	533.51	578.06
goodness of fit	8.64	740.89	738.62	176.89	742.36	929.67	918.71	972.16

Legend: \* significant to 0.10  
 \*\* significant to 0.05  
 \*\*\* significant to 0.01

### Personal victimization

Table 3: Logistic regression for personal victimization

	robbery	sexual incidents	assaults	personal theft
sex			**	
age	*	***	**	**
education				
marital status				
district of residence				
status of residence	**			
type of residence				
fear of crime				
social network				
-2 Log Likelihood	150.99	311.39	551.85	743.53
goodness of fit	1193.42	466.52	975.69	970.73

Legend: \* significant to 0.10  
 \*\* significant to 0.05  
 \*\*\* significant to 0.01

The age is the most deterministic factor for personal victimization which was shown by the comparison between models of personal victimization. The probability for personal victimization decreases with the age of Ljubljana inhabitants. Sex, the most deterministic characteristic in social sciences, has no (statistical) influence on Slovenian victim. Females are not less victimized in comparison with males with the exception of assaultive offence. But even in this case, there was only a slight difference. Maybe we can presume that these results point on emancipation of Slovenian women.

Also other characteristic had no statistical important effect on victimization, which Slovenian victims differ from the victims elsewhere.

## 4 Conclusions

The use of the logistic regression to analyze the vulnerability and attractiveness of crime victims gave us some interesting results. Let us draw some conclusions:

1. Universal deterministic characteristic does not exist to explain the vulnerability and attractiveness of a crime victim. Age as an exception for personal victimization.
2. While victimization and its forms are not uniform, the characteristics for household or personal victimization are also not. Specific form of victimization had specific characteristics of crime victim.
3. Income, prevention, status of residence and social network are the best determinants for household property victimization.

4. The most important characteristic for personal victimization is age, in the case of assaultive offence sex also has significant effect on this victimization form (males were more frequently victims of assaults than females). Other sociodemographic factors: marital status, district of residence, education, social network, fear of crime, type of residence have no influence on personal victimization types.

We could describe a common household property victim as wealthier household, who lives in apartment and who has a quite extensive social network. Household's victim is also aware of the importance of the protection of its property. Typical personal victim in Slovenia could only be defined as a younger person, which is the only similar result with victims in other countries. Victim surveys elsewhere (Canada, Great Britain, USA) (see Fattah, 1991) established, that victim is not only the younger person, but also single, who lives in the city and, what is more important, the victim is usually male.

However, we can not say that these significant characteristics are final and unchangeable. If a household or its member does not have the attributes of a typical victim, that does not mean that it has not been victimized. We can only say that its victimization risk is lower.

Logistic regression clears up the victim issue only from one aspect. This forces us to examine victimization from other points of view, too. For better understanding of victimization not only in Slovenia but also elsewhere, it is necessary to distinguish between unique and multiple victim. To resolve this problem, we can also use logistic regression, in this case for polytomous variables.

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