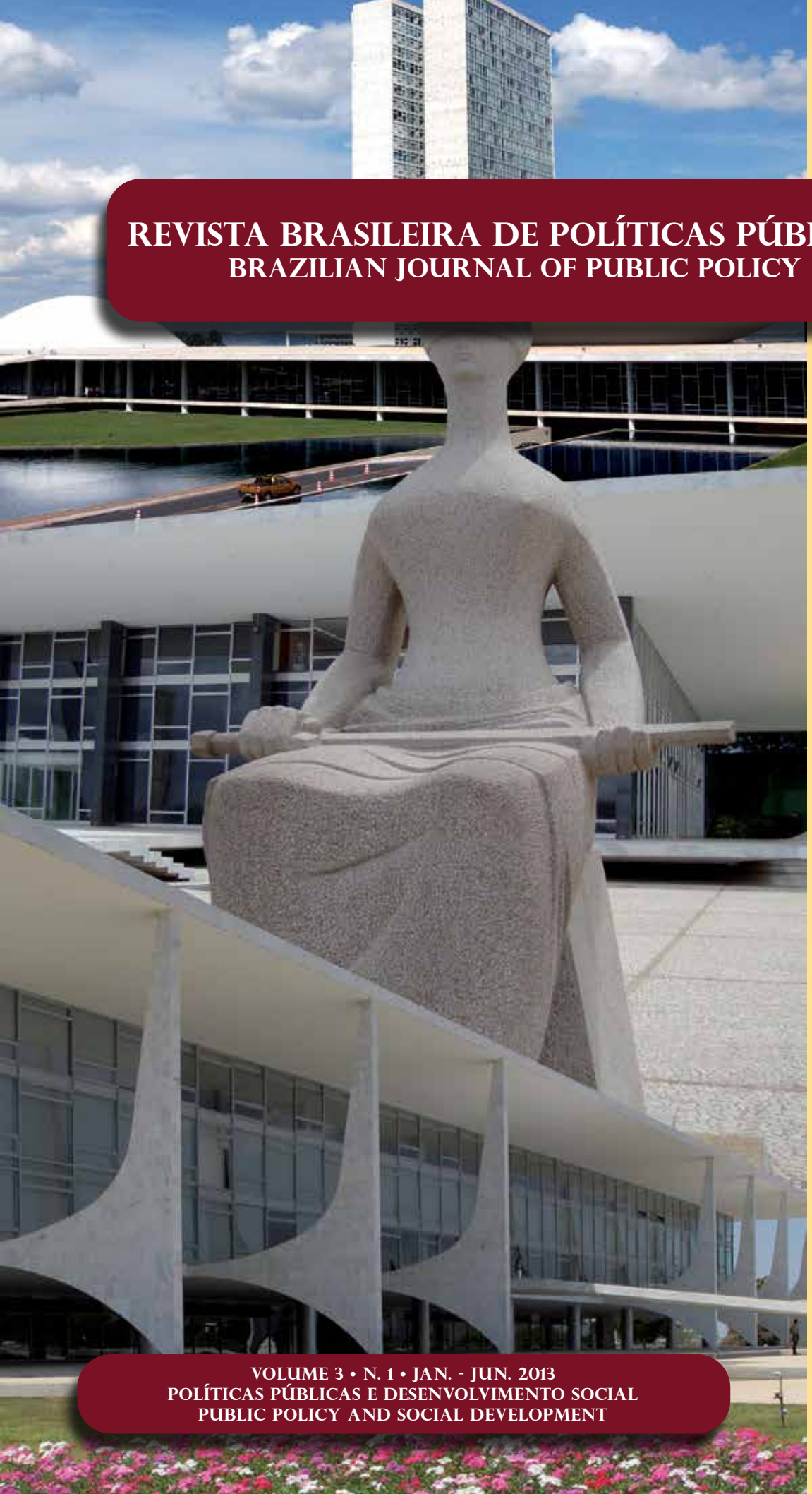

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The influence of social vulnerability and illicit drug use on recidivism of young offenders*

A influência da vulnerabilidade social e o uso de drogas ilícitas sobre as reincidências de adolescentes infratores

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Abstract

The objective of this paper is to analyze factors related with the behavior of adolescents in Conflict with the Law through the study of the relationship between recidivism in youth detention centers (YDC) and their family context, social and neighborhoods context. In this paper we identify a negative correlation between a good performance on the Social Vulnerability Index (SVI) calculated in 2004, by districts in Porto Alegre, that means low social vulnerability and recidivism in YDC. The information used here was obtained from 138 Medical records at Fundação de Atendimento Sócio-Educativo (FASE). We propose a logistic regression model to understand how risk factors for delinquency in family context and social context correspond with the available statistics of adolescents in detention centers. In this capital city, an important factor to explain the recidivism in delinquency is the drug use of "marijuana-and-solvents" and "crack" when compared with the category of "denies or does not use drugs". The results suggest that one should incorporate into the analysis the drug consumption between adolescents and their treatment in public or private health institutions. Additional work should be carried out not only in Porto Alegre but in other Brazilian cities. This work is original and useful for Law and Social Sciences research and public policies about Drugs, Delinquency and the Juvenile Court in Brazil.

Keywords: Delinquency. Brazil. Social vulnerability. Drugs.

Resumo

O objetivo deste ensaio é analisar fatores relacionados com o comportamento de adolescentes em conflito com a lei através do estudo da relação entre atos infracionais cometidos por adolescentes e seu contexto familiar, social e dos bairros onde moravam seus pais ou responsáveis. Mais de 2.800 adolescentes receberam medida judicial por parte do Juizado da Infância e da Juventude (JIJ) de Porto Alegre, Brasil, entre 2002 e 2008. Há evidências de uma correlação negativa e significativa entre um desempenho bom no Índice de Vulnerabilidade Social (IVS) calculado para 2004, por bairro, e o reingresso na unidade de internação. A informação utilizada foi obtida a partir de 138 prontuários de adolescentes da Fundação de Atendimento Sócio-educativo (FASE). Nós propomos um modelo tipo logit para explorar como fatores de risco de delinquência na dimensão familiar e do contexto social correspon-

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dem com estatísticas disponíveis de adolescentes com medida de internação. Na capital gaúcha, um fator importante para explicar os reingressos foi o consumo de drogas, na categoria "maconha-e-outras" e na categoria consumo de "crack", ao compararmos com a categoria de "nega ou não consome drogas". Os resultados sugerem atenção ao consumo de drogas pelos adolescentes e seu tratamento em instituições de saúde públicas ou privadas. Novas pesquisas devem ser feitas não apenas em Porto Alegre mas em outras cidades do Brasil. Este trabalho é original e de utilidade para pesquisas na área de Direito, Ciências Sociais e Políticas Públicas sobre Drogas, delinquência e sistema de justiça juvenil no Brasil.

Palavras-chave: Delinquência, Brasil, Vulnerabilidade social, Drogas.

1 Introduction

In this article, violence is measured by the infraction acts of adolescents in Porto Alegre (delinquency). The city concentrated between 2002 and 2006 the largest absolute number of crimes in Rio Grande do Sul state (RS), with rates of 29, 21, 23, 24 and 19 homicides per 100,000 inhabitants, respectively. The rates of violence - corresponding to the sum of the number of threats, injuries and mistreatment - were between 2,200 and 2,500 cases per 100,000 inhabitants, per year, during the same period. However, the adolescent population is the subject of violence. In Schabbach [4] the presence of gangs of children and adolescents is tackled by the analysis of violent crime for the 1990s and early 2000s in RS state. Nedel[5] presents data from the *4th Juizado da Infância e Juventude (JIJ)*, in Porto Alegre, from 2004 to 2006 observing the increase in the number of juvenile delinquents. Other studies in RS with information on juvenile offenders are Neto[6], Neto[7] and Vasconcellos[8].

According to Data Processing Company of the State of Rio Grande do Sul (PROCERGS)[9], in the years 2005, 2006, 2007 and 2008 were consummated, respectively: 8, 12, 36 and 5 homicides against adolescents in Porto Alegre. For the same period and the city, the participation of adolescent offenders in homicides was: 25 (2005), 9 (2006), 9 (2007) and zero (2008). From 2007, there were more homicides committed against teenagers than those committed by them. In turn, the homicides attempts against adolescents reached 125 while there was a total of 64 attempts homicides by teenagers. None of these facts can be justified in any society.

The Vulnerability Index to Youth Violence (IVJ-V)[10] - by the *Brazilian Forum on Public Safety (FBSP)* in partnership with the *State System of Data*

[4] SCHABBACH, L. M. *Tendências e preditores da criminalidade violenta no Rio Grande do Sul*. 2007. 328 f. Tese (Doutorado em Sociologia) – Programa de Pós-graduação em Sociologia, Instituto de Filosofia e Ciências Humanas, Universidade Federal do Rio Grande do Sul, Porto Alegre, 2007

[5] NEDEL, C. *Justiça instantânea*: uma análise dos mecanismos de integração operacional para o atendimento inicial de adolescentes em conflito com a lei. 2007. 168 f. Dissertação (Mestrado) – Programa de Pós-graduação em Ciências Criminais, Faculdade de Direito, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, RS.

[6] NETO, L.A.M. *Internações no Centro da Juventude de Santo Ângelo*: diferenças e peculiaridades com as demais unidades de internamento da FEBEM, localizadas no Rio Grande do Sul. 2001. 128 f. Monografia de especialização (Especialista em Métodos Estatísticos) – Programa de Pós-graduação em Métodos Estatísticos, Universidade Regional Integrada do Alto Uruguai e das Missões, Santo Ângelo, 2001.

[7] NETO, L.A.M. Características dos adolescentes infratores internados no centro de atendimento sócio-educativo regional de Santo Ângelo e modelagem do fluxo de ingressos na fundação de atendimento sócio-educativo do estado do Rio Grande do Sul. 2003. 190 f. Dissertação (Mestrado em Ciências no Domínio da Modelagem Matemática) – Programa de Pós-graduação em Modelagem Matemática, Depto. Física Estatística e Matemática. (DeFEM), Depto. de Tecnologia (DeTEC), Universidade Regional do Noroeste do Estado do Rio Grande do Sul, Ijuí, 2003.

[8] VASCONCELLOS, S.J.L. *Cognição Social e Comportamento Agressivo na Adolescência*: uma amostra de adolescentes da Fundação de Atendimento Sócio-Educativo do Rio Grande do Sul. 2003. 116 f. Dissertação (Mestrado em Ciências Criminais) – Programa de Pós-graduação em Ciências Criminais, Faculdade de Direito, Universidade Católica do Rio Grande do Sul, Porto Alegre, 2003.

[9] COMPANHIA DE PROCESSAMENTO DE DADOS DO ESTADO DO RIO GRANDE DO SUL (PROCERGS). *Adolescente infrator*: homicídio em Porto Alegre. 18 March 2008.

[10] The IVJ-V was calculated for the population 12 to 29 years in 266 Brazilian cities with more than 100.000 inhabitants and consists of a weighted average that includes the following indicators: homicide mortality indicator, an indicator of mortality from traffic accidents, indicator of school attendance and employment, an indicator of poverty and inequality. BRASIL. Ministério da Justiça. *Projeto Juventude e Prevenção da violência*. Available in: <http.//www.forumseguranca.org.br/institucional/wp-content/uploads/2009/11/relatorio_pjpv_2009.pdf>. Access in: mar. 2010.

Analysis (SEADE) - estimated the value of 0.342 (medium-low vulnerability) for Porto Alegre[11].

However, in this paper the focus is on the determinants of adolescents behavior's *in conflict with the law* under the approach of risk factors for delinquency of the adolescent population in Porto Alegre, separating this from the problem of victimization of adolescents as above; this is necessary for they are complex issues. In this article we engage (theoretically) in delinquency acts committed by adolescents, however, it should be noted that adolescents are both victims and perpetrators of violence.

The main objective is the study of the relationship between risk factors of the surroundings where the teenager lived (with their parents or family members) - neighborhood and social context and family context - and recidivism in Youth Detention Centers (YDC)[12] due to delinquency acts committed by adolescents whom had received judicial order, but whom had left the institution, in Porto Alegre in the period between 2002 and 2008.

If factors such as weak family structure among others interact with the negative influence of peers, illicit drug use, school dropout, etc., the result is that teens are more vulnerable and more prone to delinquency.

2 Theoretical considerations

In 1997, the National Council for Crime Prevention in Canada identified risk factors for the population under 18 years old. These risk factors were defined as "life experiences of young people that increase the chances of youth being victimized or of developing one or more behavioral problems"[13]. According to UNODC[14], these risk factors for delinquency and irregular situations can be found in the family life of young people or in their experiences in school and/or in the communities where they live. These factors may be nested into three different levels: individual, family and community. The risk factors identified were:

Difficult personality or temperament;
Problems caused by diseases or brain disorders;
Family violence, such as verbal and emotional abuse and neglect;
Childhood trauma caused by sexual and physical abuse;
Poor Family supervision and lack of disciplinary skills;
Parent's alcoholism or drug addiction;
School dropout and other school problems;
Poverty or low social-economical status.

However, they warn that these factors *per se* do not imply behavioral problems unless they "co-exist". For example, low social-economical status *per se* does not imply a tendency to delinquency, otherwise, only persons of low social-economical status would commit delinquency and crimes, which can be contested by looking at the real facts. UNODC includes risk factors for delinquency such as: lack of education and employment opportunities, migration, use of illicit drugs or use of other substances in a harmful way and peer pressure. In this paper, we saw that could be accompanied by a wider range when considering, for example, alcohol consumption by adolescents, patterns of antisocial conduct that fall within youth culture, gang membership, lack of human values such as conformity, benevolence and security, as suggested by Schwartz[15]. It is worth mentioning among the factors that influence adolescents in conflict with law featured in Adorno, Bordini, and Lima[16]: "lower participation in sports activities, less commitment to volunteer work, less frequency in mediation programs and conflict resolution".

Gaviria and Raphael[17] studied the behavior of young people under the influence of peers, using ques-

[11] BRASIL. Ministério da Justiça. *Projeto Juventude e Prevenção da violência*. Available in: <http.//www.forumseguranca.org.br/institucional/wp-content/uploads/2009/11/relatorio_pjpv_2009.pdf>. Access in: mar. 2010.

[12] Youth Detention Centers (YDC). In particular, Centro de Internação Provisória Carlos Santos (CIPCS) and Centro de Atendimento Sócio-Educativo Feminino (CASEF), those beyond to Fundação de Atendimento Sócio-Educativo do Estado do Rio Grande do Sul (FASE) in Porto Alegre.

[13] CENTRE FOR RESEARCH ON YOUTH AT RISK, St. Thomas University (STU). *Risk Factors*. Available in: <http.//www.stthomasu.ca/research/youth/risk.htm>. Access in: 05 set. 2009.

[14] UNITED NATIONS DRUG AND CRIME (UNODC). Unicef. *Manual for the measurement of juvenile justice indicators*. UN, New York, 2006. Available in: <http.//www.un.org>. Access in: 25 jun. 2009.

[15] SCHWARTZ. *Ten individual level value types.* Available in: <www.imo-international.de>. Access in: 26 jan. 2010.

[16] ADORNO, S.; BORDINI, E.B.T.; LIMA, R.S. O adolescente e as mudanças na criminalidade urbana**.** *São Paulo em Perspectiva*, São Paulo, v. 13, n. 4, p. 62 – 74, out./dez. 1999.

[17] GAVIRIA, A., & RAPHAEL, S. (2001). School-based peer effects and juvenile behavior. *The Review of Economics and Statistics***,** Cambridge, MA., v. 83, n. 2, p. 257 – 268, Quarterly, 2001.

tionnaires in National Education Longitudinal Survey (NELS). The five activities evaluated in juvenile behavior were illicit drug use, alcohol, cigarette smoking, church attendance and the probability of dropping out of high school. Endogenous effects (of peers) and contextual effects (of the family atmosphere) would influence the behavior of young people.

Most studies in this line include as a covariate, family socioeconomic status (SES for social-economical status), measured by the combination of variables such as parental education, parental economic activity and household income. However, with the focus on personality traits, Agnew et al.[18] inquire why some children are more prone than others to the conflict with the law, as a reaction to pressure and stress (or distress - strain -). The answer would be in personality traits such as strong negative feelings and lack of boundaries. Negative feelings such as anger, would be a result of frustration, loss and/or mistreatment received during life.

The national and international literature disclose that, while there are indications of increased violent behavior of adolescents, there is evidence of the growth of victimization in this population group. The victimization is related not only to increased rates of adolescent homicides, but also increased consumption and trafficking of illicit drugs that affects not only the poorest teenagers, but also the middle classes, as said by Adorno et al. Other studies in Brazil point out about the vulnerability of adolescents against violence and crime ([19], [20], [21]).

For the exposed above, we will include variables related with the social and family context of the adolescents in conflict with the law, among other variables such as illicit drug use, to explain recidivism (more than one entry) in YDC, in Porto Alegre, between 2002 and 2008.

3 Materials and methodology

This paper uses the method of estimation by logistic regression, that is, a probability model with *logit* relation function. The relation function can be used in multiple logistic regression models when exists more than one explanatory variable. However, it is recommended to be careful with the interpretation of the results of the coefficients obtained, according to the explanatory variable (in the vector **x**) if it is continuous or if it is discrete (binary or multiple categories - Multinomial -). In particular, in this paper logistic regression is used to estimate the probability of recidivism ($Y = 1$), and in the right side of the equation are adolescents' personal information in the form of categorical explanatory variables. Previously, we analyzed the relationship between variables. For a variable of *k* categories are used *k-1* design categories (dummies). From contingency tables can be calculated odd-ratios (Odd Ratio - OR) and obtained the estimated coefficients. We first evaluate the coefficients for simple models (one variable) and then proceed to estimate the multivariate model with selected variables.

3.1 Logistic regression model

In the logit model, the dependent variable is discrete (*dummy*) and may take binary values of 0 or 1. Departing from the traditional model of linear regression to estimate the expected value of Y (dependent variable), controlled by x (explanatory variable or independent variables vector **x**):

$$E(Y \mid x) = \beta_0 + \beta_1 x \qquad (1)$$

There are no restrictions on the values of Equation (1), while x assumes values between $-\infty$ and $+\infty$. However, in the logistic regression model is predicted a probability value (π) for the occurrence of an event, such that, it is necessary that the values are between 0 and 1. In the case of the logit regression model distribution's, functional form is given by Equation (2) below so that the values of the conditional mean of $Y|x$ are between 0 and 1:

$$\pi(x) = \frac{e^{\beta_0+\beta_1 x}}{1+e^{\beta_0+\beta_1 x}} \qquad (2)$$

The logit transformation of $\pi(x)$ is in the following Equation (3)[22]:

[18] AGNEW, R. et al. Strain, personality traits, and delinquency: extending general strain theory. *Criminology*, PA, v. 40, n. 1, p. 43 – 71, Quarterly, 2002.

[19] WAISELFISZ, Júlio J. (coordenação técnica). Juventude, violência e cidadania: os jovens de Brasília. *Mapeamento da violência no Brasil.* 1998. Available in: <http. //www.unodc.org//>. Access in: 19 nov. 2007.

[20] WAISELFISZ, Júlio J. *Mapa da violência IV***:** os jovens do Brasil. 2004. Available in: <http.//www.unodc.org//>. Access in: 19 nov. 2007.

[21] WAISELFISZ, Júlio J. *Mapa da Violência 2006:* os jovens do Brasil. Brasília: OEI, 2006.

[22] HOSMER, D.W.; LEMESHOW, S. *Applied logistic regression*. 2. ed. MA: Hohn Wiley & Sons, 2000.

$$g(x) = 1 - \left[\frac{\pi(x)}{1-\pi(x)} \right]$$

$$= \beta_0 + \beta_1 x \qquad (3)$$

If Y is a binary dependent variable $Y_i = 1$ when the occurrence of success or $Y_i = 0$ when there is not (failure). Then, the expected value of $Y \mid x$ is $Y = \pi(x) + \varepsilon$. If $y = 1$ then $\varepsilon = 1 - \pi(x)$ with probability $\pi(x)$. If $y = 0$ then $\varepsilon = -\pi(x)$ with probability $1 - \pi(x)$. The distribution of ε have zero mean and variance $\pi(x)[1-\pi(x)]$. The error term (ε) will not have normal distribution, but binary (HOSMER ; LEMESHOW)[23].

To estimate the unknown parameters β_0 and β_1 in Equation (2) is used the method of Likelihood Maximum (LM) instead of Ordinary Least Squares (OLS). The LM method consists in to estimate a function that allows obtain the unknown parameters that maximize the probability of obtaining the results closer to the observed data.

Based on the results of the log likelihood function of Equation (4) in the logistic regression, is feasible test the statistical significance of the estimated coefficients, calculate interval of confidence, and significance tests performed on the model (Wald test, Score test, and the likelihood ratio test).

$$L(\beta) = \ln[l(\beta)] = \sum_{i=1}^{n} \{ y_i \ln[\pi(x_i)] + (1-y_i) \ln[1-\pi(x_i)] \} \qquad (4)$$

3.2 Analytical procedure

Logistic regression is used to estimate the probability of recidivism ($Y = 1$) (when more than one entry for an adolescent in a youth detention center – YDC-[24]), and in the right side of the equation are adolescents' personal information in the form of categorical explanatory variables. For example, for color-skin, if the base category or control category is color-skin White (1) and there are three categories, we have two dummies:

Figure1 – Dummies for categorical variable

Skin	Skin_*Parda*	Skin_Black
White (1)	0	0
Parda (2)	1	0
Black (3)	0	1

Source: (The authors)

We first evaluate the coefficients for univariate models and then proceed to estimate the multivariate model with selected variables. Then, we propose to estimate the model in

Equation (5):

$$Y_i = 1 \mid X_{ij} = \beta_0 + \beta_1 skin\_m + \beta_2 drugs\_m + \beta_3 family\_m \qquad (5)$$

That is, we include variables of statistically significant categories, previously tested in contingency tables. The group of three variables to be tested in the model is justified as:

The rationale for minimizing the number of variables in the model is that the resultant model is more likely to be numerically stable, and is more easily generalized. The more variables included in a model, the greater the estimated standard errors became, and the more depend the model becomes on the observed data. (HOSMER; LEMESHOW[25]).

3.3 Personal and family atmosphere

The total number of measured aspects can be gathered in the dimensions of individual characteristics such as age when the delinquency act, gender, skin, aspiration, appearance, behavior, critical judgment, if suffers from some disease, if is influenced by others to commit the delinquency act, family involvement in crime and/or in illicit drugs and alcohol, own drug use and alcohol consumption. Also, other characteristics of economic activity of the adolescent and his/her responsible (parents or responsible), as well as education, family structure (family composition, parents' marital status, other marriages of the parents), and delinquency act committed. All these were explored based on the Individual Service Plan (PIA) - medical records- after authorization in ethics committee of our post graduate program. However, not

[23] HOSMER, D.W.; LEMESHOW, S. *Applied logistic regression*. 2. ed. MA: Hohn Wiley & Sons, 2000.

[24] For just one entry in YDC, $Y = 0$.

[25] HOSMER, D.W.; LEMESHOW, S. *Applied logistic regression*. 2. ed. MA: Hohn Wiley & Sons, 2000.

all PIA were filled in the same way, and there are not digitalized but handwritten.

4 Results

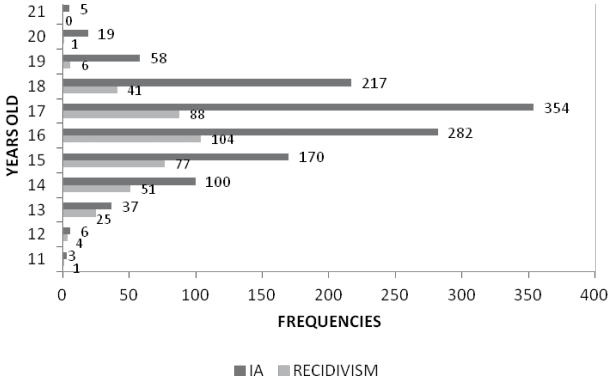
The institutions consulted to obtain the information and data analyzed in this study were: Judiciary of the State of Rio Grande do Sul through the 3rd Circuit's Juvenile Court for Children and Youth (JIJ) and the Central Court and the Bureau of Statistics and Register of Judges Activity (SERAJ), the Foundation for Social Welfare and Citizenship (FASC) of the city of Porto Alegre, through the Foundation for Social-Educational (FASE) Rio Grande do Sul.

Of the total number of adolescents in conflict with the law, were chosen those that receive a judicial admission - and were turned off - at FASE, in Porto Alegre, from 2002 to 2008. The variable considered for measuring delinquency in adolescence was the readmission (recidivism) of adolescents in detention center, specifically, temporary detention center Carlos Santos (CIPCS) and Center for Socio-Educational Care Female (CASEF).

4.1 Adolescents in Group 1

From 5,078 records of entries, from 2002 to 2008, the Temporary detention center Carlos Santos (CIPCS) and Center for Socio-Educational Care Female (CASEF)- belonging to *FASE* - were extracted- by a convenience method- records of 1,251 adolescents (92% men). This data has the following information: race, age at which teenagers committed the delinquency act (AI), reason for the sentence of detention, the neighborhood district of family member or their parents and number of entries (recidivism means more than one entry). This is the group whose available information was complete. In the other records of entries (the others 3,827), there was missing information about the neighborhood or the reason for entry, or both, which is why these cases were not included, because without such information it was impractical to continue the study. Figure (1) below illustrates, by age, the frequency of AI and recidivism in absolute values. Considering the range between 12 and 18 years old, the trend is increasing AI in relation to age. The AI has a peak at age 17, while the peak of recidivism is 16. After these ages, the values decrease, having in mind that when they are 18 years old, the youth is no longer under the jurisdiction of the Statute of the Child and Adolescent (ECA). The maximum age to stay at the Center of Detention is up to 21 years old, and the maximum time is up to three years[26] .

Figure 1 - Frequencies of delinquency act (AI) per age and recidivism per age in the group of 1,251 adolescents in detention centers (CIPCS and CASEF) 2002-2008.



Source: (The authors).

Note: Source of data FASE - Assessoria de Informação e Gestão[27]..

For the 1,251 complete records, 46% have white skin, 27% *parda* and 27% black. Nearly 82% of them were aged between 15 to 18 years old. In relation to the offense, 47% of AI correspond to robbery and theft joint with damage to property and others, 33% measure regression and measure breaking, 11% possession and trafficking of illicit drugs, 4% murders and injuries ,among other less frequent ones.

Most of the adolescents had only one entry in CIPCS or CASEF, in the period analyzed representing 68% of the total. However, the remaining 20.5% had another detention, 6.5% had other two detentions and 5% three or more recidivism. The maximum number of recidivism reached for one teenager was up to seven.

Recidivism means more than one entry into the Detention Center, because of judicial determination. As it is well known that the survey analyzed had at least

[26] BRASIL. Presidência da República. *Lei nº. 8.069, de 13 de Julho 1990*. Available in: < http://www.planalto.gov.br/ccivil_03/leis/L8069.htm >. Access in: Mai, 2012.

[27] FUNDAÇÃO DE ATENDIMENTO SÓCIO-EDUCATIVO. Assessoria de informação e gestão (AIG). *Tabelas de adolescentes internados e desligados na unidades de Porto Alegre*: período 2002 – 2008. Porto Alegre: FASE, 2009.

one entry, the recidivism was considered the dependent variable for statistics estimations. This is because of the statistical properties, more attractive in terms of randomness. The period of time for each adolescent in *CIPCS* or *CASEF* varies with the duration determined by a judge (according to the ECA's legislation).

Porto Alegre city is divided in sectors (a sector is compound of neighborhoods), to promote the public participation of citizens, in the planning of the city. For each sector of the *Orçamento Participativo* (OP), the *Observatório de* Porto Alegre[28] estimated in 2004, a Social Vulnerability Index (SVI). The index is formed by the dimensions of income, education, longevity, vulnerable children and youth, child development and housing. To identify possible contextual effects, we use the SVI as a proxy variable of the development of the sector at which each neighborhood belongs. The SVI has a range of values of zero (0) to one (1), the higher the SVI, the lower the social vulnerability. According to the same source, from 0.0 to 0.5 SVI is considered very low and the social vulnerability would be very high. From 0.5 to 0.7 SVI is low, which would indicate high social vulnerability. From 0.7 to 0.8 SVI is medium, indicating that the social vulnerability could be considered low.

The Table (1) shows the zero-order correlation (Pearson's correlation). There is a moderate-low correlation equal to -0.35 (10% significance level) between the percentage of recidivism by OP sector with the SVI 2004. This means that the higher the SVI 2004, the lower social vulnerability and the lower the percentage of recidivism by neighborhood (RECID/NGB). At the level of neighborhoods, this result is consistent with the hypothesis that high social vulnerability is a risk factor for delinquency. The SVI 2004 correlations with the variables of percentage of the population with householder with less than four to eight years of study (4-8 STUDY) and the percentage of the population with householder up to two minimum monthly salary income (2 SMR) (in 2000) are strongest, because they compound the SVI indicator. However, used them to measure the correlation with recidivism rate (RECID/ NGB) does not yield significant correlation coefficients. There is evidence, therefore, the suitability of the chosen indicator (SVI) everything else constant.

[28] PORTO ALEGRE. Secretaria do Planejamento Municipal. *Mapas de inclusão e exclusão social de Porto Alegre.* Porto Alegre, 2004. Available in: <http.//www.observapoa.palegre.com.br/default.php?p_secao=10>. Access in: 26 Jan. 2010.

Table 1 - Matrix of zero-order correlations (Pearson) between SVI 2004 and the percentage of young offenders with recidivism, by neighborhood (RECID/ NGB)

PEARSON'S CORRELATION	SVI 2004	% RECID/ NGB	4 up to 8 Years of study	Less than 2 Monthly Real Salary
SVI 2004	1			
% RECID/ NGB	**-0,350*** **(0,068)**	1		
4 up to 8 Years of study	-0,532*** (0,004)	-0,203 (0,299)	1	
Less than 2 Monthly Real Salary	-0,546*** (0,003)	-0,207 (0,290)	0,972*** (0,000)	1

Source: The author. Note: In parenthesis two-tailed test of statistical significance. *** P <0.01, ** p <0.05, *p <0.1. (P-value). Software SPSS Statistics 18.0.

4.2 Adolescents in Group 2

In order to verify the relationship between risk factors and social or family context, was prepared a sample of 138 medical records of adolescents at CIPCS-CASEF, randomly selected. The sample size was calculated considering a percentage of judicial sentence for detentions in Porto Alegre ($p = 0{,}10$), to be representative of the population of juvenile offenders from 2002 to 2008. The

total number of measured dimensions can be gathered as general characteristics, other features from the adolescent and from his/her parents (or family members) are their economic activity, as well as their education, family structure, habits and influence of the environment, among others (for example, physical health, mental health etc.). All those variables were explored in the Individual Service Plan (ISP) (from psychiatric evaluation at FASE) of 138 adolescents' records.

Table 2 - Results for simple model tests for explanatory variables (vector **x**) with dependent variable Recidivism ($Y = 1$), Group 2 (coefficient, standard error, Z-statistics, P-value, *odd ratio*)

	COEF	SE	Z	P- value	OR
VARIAVEL/ Skin* 0= *WHITE*					
2 *parda*	0,34	0,47	0,73	0,46	1,41
3 black	0,89	0,44	2,03	**0,04	2,44
VARIAVEL/ social interactions of peers* 0= Friends					
1 neigborghood	0,88	0,70	1,25	0,21	2,4
VARIAVEL/ economic activity* 0= ANY					
1 civil construction	-0,79	1,14	-0,69	0,49	0,4
4 others	-0,51	1,04	-0,49	0,62	0,60
VARIAVEL/ adolescent' education* 0= basic EDUCATION					
1 basic educ no complete	-1,16	1,25	-0,93	0,35	0,31
3 high school no complete	-1,39	1,41	-0,98	0,33	0,25
6 illiteracy	-2,08	1,66	-1,25	0,21	0,13
VARIAVEL/ Situation at Home* 0= Home CONFLICTS					
2 Home STRUCTURED	-1,76	1,08	-1,63	*0,10	0,17
3 Broken Home	-0,92	0,95	-0,97	0,33	0,40
4 Does not know his/her father	-0,92	0,99	-0,92	0,36	0,40
VARIAVEL/ Illicit_Drug_Use* 0= USE CRACK					
1 marihuana	-2,25	0,92	-2,46	***0,01	0,11
2 marihuana and other	-1,64	0,85	-1,94	**0,05	0,19
4 no use or deny	-2,70	0,98	-2,77	***0,01	0,07
VARIAVEL/ Illicit_Drug_Use_m * 0= NOT USE OR DENY USE					
1 marihuana	0,45	0,71	0,63	0,53	0,45
2 marihuana and other	1,06	0,62	1,71	*0,09	1,06

Source: The author. Note: *** p <0.01, ** p <0.05, * p <0.1. p-value. Software Stata 10.0.

Table (2) brings the test's results for seven categorical variables - vector **x** - having as a dependent variable the probability of recidivism $Y = 1$ (if not recidivism $Y = 0$) at CIPCS-CASEF. Only three of these categories were statistically significant. Interpreting OR (with the sign of the coefficients obtained) instead of the marginal effects, the category Skin_3 = BLACK increases the probability of recidivism 2.44 (144%) times in relation to the status of control (Skin_1 = WHITE) at 5% significance. The category Situation_at_Home_2 = Home STRUCTURED decreases the probability of recidivism 0.17 times (less 83%) in relation to the base category (Situation_at_Home_1 = Home in CONFLICT) at 10% statistical significance. The category Illicit_Drug_Use was significant for all categories when the base category Illicit_Drug_Use_3 = CRACK, however, when shift to the base category Illicit_Drug_Use_4 = no use or DENIES the interpretation of OR indicates increases of 1.06 and 2.70 times respectively in the probability of recidivism when Illicit_Drug_Use_2 = marijuana and other (solvents), significant at 10% and when Illicit_Drug_Use_3 = Crack, significant to 1%. For Illicit_Drug_Use_2 = marijuana and other (solvents) in contrast with Illicit_Drug_Use_4 = no use or DENIES there is an increased ratio of probabilities (odd-ratio) of 1.06/1.0 (or 6%) of recidivism. And for Illicit_Drug_Use_3 = Crack in contrast with Illicit_Drug_Use_4 = no use or DENIES there is a increased ratio of probabilities (odd-ratio) of 2.7/1.0 (or 170%) for recidivism.

We ran a logit regression model for recidivism (binomial) with the following variables: skin color, illicit--drug use and family structure. However, only 47 medical records of teenagers gathered information on all these issues. Alternatively, for 110 medical records in Group 2 we can use the variables illicit-drug use and skin color of Equation (1). "Reing1" is the univariate model for the Illicit_Drug_Use_ and intercept whereas "Reing2" is the model using variables Illicit_Drug_Use_, Skin_color and intercept. In Table 3, Reing1, marijuana and other (solvents) have an increased probability of recidivism in detention center 2.92 times higher than in the category "no use or deny", and this effect is statistically significant at 10% . The use of crack impacts 14.88 times increasing the probability of recidivism, with respect to "no use or deny", significant to 1%.

In Reing1 the hypotheses for the effects of use illicit drug equal to zero can be rejected at the 0.05 level of significance. However, the Reing1 concentrates almost 92% of observations being predicted probabilities between 0.2 and 0.4 which indicates that the percentage of "success" ($Y = 1$) in the simple model is very low (close to 9% - 9/110 -) and that model is not accurate to estimate the probability of recidivism, but only to highlight an explanatory variable with statistical significance. The results for the multivariate model are presented in Reing2. However, the intercept is not statistically significant. In consequence, use of illicit drugs can be used to explain, statistically, the probability of recidivism at CIPCS or CASEF in Porto Alegre. At ninety percent of statistical confidence, the categories marihuana-and-solvents as well as crack have statistical significance, with the category of non-use or denies consumption such as control.

Table 3 – Models of logistic regression for recidivism in CIPCS or CASEF, 110 adolescents, 2002 a 2008, in Porto Alegre

VARIAVEL	Reing1	Reing2
Drog=1 (marihuana)	0,448	0,434
	(0,713)	(0,777)
OR	1,56	1,54
Drog=2 (marihuana and solvents)	1,072*	1,145a
	(0,624)	(0,704)
	2,92	3,14
OR	2,700***	2,834***
Drog=3 (crack)	(0,980)	(1,037)
	14,88	17,00
OR		-1,171**
Skin =1 (white)		(0,515)
		0,31
OR		-0,653
Skin =2 (parda)		(0,577)
		0,52
OR	-1,447***	-0,731
Constant	(0,558)	(0,66)
	9,01	11,69
Wald Chi2(#var)	0,0292	0,0393
Prob > chi2	0,0758	0,1124
Pseudo R2	-66,636	-63.997
Log pseudoprobability	110	110
Observations		

Source: The author. Note: Standard errors (robust) in parentheses, *** p <0.01, ** p <0.05, * p <0.1. p-value. Significant at 0.15 level of significance. Stata Corp. 10.0.

5 Conclusions

High and Very High Social Vulnerability in the neighborhoods where adolescents in detention centers CIPCS or CASEF (2002 - 2008) lived with their parents or family members in Porto Alegre, were risk factors for delinquency, as the initial hypothesis of this article. Ho-

wever, there was no significant difference between living in a neighborhood or another, to return to recidivism during the studied period, from 2002 to 2008. This is due to the fact most of those responsible for adolescents lived in neighborhoods with high or very high social vulnerability, this discovery was made during the research. There is evidence of a negative correlation between a high value of IVS2004 for a neighborhood and recidivism: when the lower social vulnerability, the higher IVS2004 indicator and the lower the probability of recidivism. The way in which social interaction occurs at the neighborhood level was not detected in this study. Still, the risk factors for delinquency interact together rather than separately. For example, identifying other risk factors in Group 2 of the research – medical records of 138 adolescents - a variable with statistical significance to explain the probability of recidivism (Y = 1) was the illicit-drug use in the categories marijuana-and-solvents and crack, compared with the category of "non illicit-drug use or deny".

We consider that the dimensions of individual personality and family context should be explored in studies of violence although in this paper, the results were not conclusive to affirm that: family structures of one kind or other, exerts influence on the behavior of delinquency (or not) of adolescents. The 138 medical records gathered, in part, life stories of teenagers with troubled lives of one or multiple forms: low education and/or difficulty to continue their studies, learning difficulties, deprivation, family conflicts or fragile structure (broken homes), relatives involved with illicit drugs (use and/or trafficking), crime and alcoholism and illicit drug use, parental abandonment, rejection, peer pressure and threats of traffickers, domestic violence, among others. Although the data sources and used bases are very useful, it is necessary to systematize the information of all adolescents at *FASE* thoroughly and carefully for further research in this line. For example, for a total of adolescents that were in detention centers CIPCS or CASEF, there was not systematized data about illicit-drug use. The information used here was obtained from 138 Medical records (with handwritten templates by Social Workers) at *FASE*. The sample was randomly selected and the sample size was calculated statistically. The same lack of information about the family or socioeconomic dimension of each of the adolescents, also limited the methodological implementation. However, the model highlighted the influence of one variable: illicit-drug use as explanatory for increase in recidivism probability. Yet, there is not enough information about the direct causality between the consumption of illicit-drugs and delinquency. This issue can be studied in further research in Brazil, as it has been done in other countries in the world. What is said in the results here is that illicit-drug use increases the probability of recidivism for the adolescents Group 2 at *FASE*.

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