



Risk Behaviours in Adolescence: Risk and Protective Factors

Valentina C. Chitas

Programa de Doutoramento em Comportamento Desviante / Faculdade de Psicologia e de Ciências da Educação / Universidade do Porto

vchitas@netcabo.pt

Abstract

This presentation put forward the preliminary results of a study undertaken in the context of a PhD dissertation on risk and protective factors linked to deviant behaviour in adolescence. The study employs a sample of 1042 adolescents (mean age 16 years), drawing from elementary and high schools of Lisbon's suburban area. Measures of deviant behaviour include drug use (alcohol, tobacco and marijuana) and antisocial behaviour (physical and verbal violence, crimes against propriety and indiscipline). Independent measures assess individual, interpersonal and contextual factors: expectations about drug use, self control, motivation and academic achievement, parenting, peers' relations, social control and social support from neighbourhood.

A summary of epidemiological local data is presented and the risk factors for each one of the categories of deviant behaviour are examined through a regression analysis. Statistically significant associations were found for most of the factors considered. Peer relations and expectations about drug, and sensation seeking appear to be the strongest predictors for drug use and antisocial behaviour. Parental monitoring and positive bounding to school are negatively related to both drug use and antisocial behaviour.

Key Words: Drug use, antisocial behaviour, risk factors, protective factors

Adolescence is often a period of vulnerability for risk behaviours. When facing the combined psychological and physiological changes that affect this period of the lifecycle, it has been estimated that one quarter to one half of US youths experience, at some point, a tumultuous route. This vulnerability may be amplified by the influences of the social, economic and cultural changes that marked the last decades, which have affected particularly youths from urban areas where the phenomena of poverty, social exclusion, and social isolation are combined with a culture of consumption, and magic passports to pleasure, success and happiness.

The worsening of these problems has fostered several research endeavours aimed at explaining the etiology of these phenomena. A large part of this knowledge

comes from the field of epidemiology and revolves around the concept of risk. Risk factors are those conditions or variables that are associated with an augmented likelihood of negative or undesirable outcomes. morbidity or mortality in classical usage, or more recently, behaviours that may compromise health, well being, or social performance (Jessor et al., 1995). The research on risk factors has become more complex in recent years, evolving from studies focused on a single variable, in a single domain to multivariate analysis which tries to map both social and personal influences over time. The interest of studying not only the conditions that may contribute to the increase of risk behaviours but also the possible factors that may protect the rise of these behaviours brings the concept of protective factors to the fore of the research. Protective factors are being

used in two different ways in the literature. Sometimes as the opposite of risk factors. *Promotive factors* (Sameroff, 1999), or as *buffering factors* that mediate or moderate the effect of exposure to risk. According to Sameroff (1999), when protective factors are regarded as the opposite of risk factors its effects manifest both in low risk populations as well as in high risk populations. When protective factors are taken as moderated variables, their effect may be null or residual in low risk populations but it is expected to be amplified in high risk populations. The methodological distinction between promotive factors and *buffering factors* demands a joint analysis of high and low risk samples.

Hawkins, Catalano, and Miller (1992), classified risk factors in two main categories: *contextual factors* and *individual and interpersonal factors*. Concerning *contextual factors*, the authors listed: factors related with laws and norms favourable toward drug use; availability of drugs; economic deprivation and neighbourhood disorganisation. Concerning *individual and interpersonal factors*, the authors mentioned: physiological factors (biochemical and genetic influences); family addiction; poor and inconsistent family management practices; family conflict; low bonding to family; early and persistent problem behaviours, academic failure; low degree of commitment to school; peer rejection in elementary grades; association to deviant peers; alienation and rebelliousness; attitudes favourable to drug use; early onset of drug use.

In the field of delinquency, Losel, Bliesener, and Kofert (1989, cit. in Kaplan, 1999) refer that since 1950 several longitudinal and cross-sectional studies have pointed to a set of common factors that are associated with delinquency: parental criminality; poor parental supervision; cruel attitudes passive or neglectfully attitudes from parents; erratic or harsh discipline mutual; conflict; large family size; socioeconomic disadvantages.

Purpose of the study.

Taking these concepts as guidelines and the major findings in empirical research, this study aims to examine risk and protective factors that are linked at an individual, interpersonal and contextual level to drug consumption and antisocial behaviour.

METHOD

Procedure

The data used in this study was collected through self completion questionnaires, mostly in a school setting

and only a few cases were gathered from dwellings of social disadvantaged neighbourhoods.

Participants

Considering the methodological guidelines presented in the literature, specifically the need of comparing populations of higher and lower levels of risk as a way of examining the interplay between risk and protective factors, this study employs a combined sampling strategy, using probabilistic sampling and purposive sampling (heterogeneity sampling) (Sadish, Cook & Campbell, 2002). Three samples were drawn. The larger one provides local epidemiological information about risk behaviours from the suburban area of Lisbon. Vila Franca de Xira. and consisted of a representative sample of 9th to 12th grade students of that region. The second sample is composed by 214 students enrolled in special teaching classes (students with low academic achievement and high prevalence of risk behaviours) and the third sample included 104 youths from disadvantaged neighbourhoods. The total sample comprises 1042 adolescents (age mean 16 years old, DP = 1.62). 92.4% are Caucasian, 6.3% are African and 1.3% belong to other ethnic groups.

MEASURES

Dependent Variables

The questionnaire included a variety of items designed to examine adolescent's risk behaviour in the areas of substance use, antisocial behaviour and sexual activity.

Three indicators of drug use (alcohol, tobacco and cannabis) were constructed based on the combination of information about prevalence (once in a lifetime, last year and last month) and frequencies of tobacco, alcohol and cannabis use. Antisocial behaviour is measured also by three indicators (indiscipline, crimes against propriety and violence) resulting from the combination of data from the prevalence and frequency of the behaviours considered. The indicator of risky sexual behaviour results from the combination of number of partners, age at first sexual intercourse, and pregnancy.

INDEPENDENT VARIABLES

Demographic Variables

Age, sex, ethnicity, parents' educational level, and parents' occupational status were the most relevant demographic variables used in this study.

Personality Variables

Sensation seeking. The questionnaire included a reduced form containing 8 items of the Sensation Seeking Scale (Zukerman, 2004)

Motivation for drug use (alcohol, tobacco and marijuana). Three scales adapted from the source scales of Wills, Sandy, and Shinar (1999) holding 21 items were used to examine the motivations for the consumption of a particular substance. Indicators of motivations for tobacco, alcohol and marijuana consumption were constructed based on a factor analysis of the scale items.

Self control. In order to assess self control (considering this concept as multidimensional), the questionnaire include 5 scales of good control (calm, planning, good delay of gratification, behavioural coping and cognitive coping) and 4 scales of bad self control (impulsivity, low level of delay of gratification, coping anger, coping tension) used in a number of studies by Wills and collaborators.

Interpersonal Factors (Relationship with Family, Peers, School and Neighbourhood)

Relationship with School. A scale with 21 items which included 14 items from the scale of Scholl Climate (Negreiros, 1996) and 7 items from the scale of motivation and academic achievement of Bryan and Zimmerman (2002) was used to examine several dimensions of the relationship with school.

Parenting. The measures of parenting included 6 scales adapted from the following source scales: Parental Support (Galambos, Barker & Almeida, 2003) Responsiveness (Paulson, 1996); Demandiness (Paulson, 1996) Parental Involvement (Paulson, 1996); Parental Monitoring (Small, 1993). Psychological Control (Barber, Olson & Sahgle, 2001).

Peer support and conflict. The questionnaire contains 4 items related to the perception of acceptance, support and conflict with peers.

Affiliation with Peers. A 19-item Scale about the perceptions of antisocial and pro-social behaviour of friends was used to examine the affiliation of deviant and not deviant peers.

Contextual influences (School and neighbourhood). Three scales containing items related to antisocial and pro-social behaviour of peers belonging to the same neighbourhood and school, were used to evaluate the broader influence of peers

In this domain, 5 items adapted from a sample of items used in a study by Nash and Bowen (1999) were also included in the questionnaire in

order to evaluate social support and social control from the neighbourhood.

RESULTS

Prevalence's of Risk Behaviour in the Representative Sample

The results reveal that the substance with higher prevalence of consumption was alcohol, with 57.9% of adolescents reporting the use of this substance in the last 30 days, and 29.2% reporting drunkenness at least once in the previous year. Distilled drinks were the most consumed in the last 30 days, 26.2% of adolescents reported the use of tobacco in the past 30 days, and for marijuana the levels of use are considerable lower with 12.2% of adolescents reporting the use of this substance at least once in a lifetime, 8.1% in the last 12 months, and 4.5% in the last 30 days. Statistically significant gender differences were found in the levels of substance use. Boys reported a higher level of alcohol and marijuana use and girls reported higher levels of tobacco use. Anti-social behaviour was assessed through a combination of items drawn from several major studies of adolescent's problematic behaviour. Three dimensions has been considered: misbehaviour in school (school suspension or expulsion, bullying, and teacher's physical or verbal offences); violence (verbal offences, fist fights, gang fights, causing injury to another person who required medical treatment, and use of weapons to threaten or harm another person), property crimes and involvement in other illegal activities (robering, breaking and entering in private houses and stores, car theft, fire setting, and drugs selling). Gender differences were also found, with significantly higher prevalence of antisocial behaviours in males. Youths with school adjustment problems were significantly more vulnerable to drug use and anti-social behaviour, and presented a higher risk of pregnancy.

Associations Among Problems Behaviour

Table 1 depicts Pearson's correlation coefficients between pair of indicators of various risk behaviours. At a first glance, it becomes salient that statistically significant associations were found among all pairs of the behaviours considered. It is worth of note the correlation between tobacco and marijuana consumption and indiscipline and also the correlations among the various antisocial behaviours (indiscipline, violence, and crimes against property). These results align with a number of previous studies (e.g., Donovan & Jessor, 1985; Negreiros, 2001) and as such contribute to reinforce the belief that risky behaviours cluster together.

Table 1. Pearson's correlation coefficients between risk behaviours (N=1042)

	Tobacco consumption	Alcohol consumption	Marijuana consumption	Indiscipline	Violence	Crimes against property
Alcohol consumption	.39**					
Marijuana consumption	.53**	.31**				
Indiscipline	.34**	.25**	.32**			
Violence	.25**	.22**	.22**	.65**		
Crimes against property	.24**	.17**	.27**	.57**	.70**	
Sexual risk behaviours	.12**	.07	.04	.28**	.31**	.25**

Associations Between Variables (Independent and Dependent Variables)

Table 2 and 3 show Pearson's correlation coefficients between response variables (at the following levels: individual, family, school and peer relationships) and indicators of tobacco, alcohol and marijuana consumption, indiscipline, violence and crimes against property. Only statistically significant correlations (0.1% significance level) whose coefficients are equal or greater than .10 were reported.

Table 2. Pearson's correlation coefficients between independent variables and indicators of tobacco alcohol and marijuana consumption

	Tobacco	Alcohol	Marijuana
Ethnicity	-	-	-.10
Family problems			
Mother addiction	-	-	.11
Father alcoholism	-	-	-
Mother depression	.11	.10	-
Parenting			
Monitoring	-.23	.19	-.22
Support	-.12	-	-
School Involvement	-.17	-	-
Achievement values	-	-	-.10
Parent attitudes toward drug use	.28	-	.23
Psychological control	.12	-	-
Personality and social behaviour			
Sensation seeking	.25	.30	.21
Playfulness	-.14	.18	-.13
Good delay of gratification	-.19	.14	-.15
Behavioural coping	-.12	-	-
Tension coping	-.12	-	-
Calm	-.15	-	-
Cognitive coping	-.10	-	-
Impulsivity	.19	.15	.15
Anger/tension	.16	.12	-
Anger/violence	.20	.16	.12
School relation			

Scholl failure	.22	.12	.13
Academic achievement	-.22	-.14	-.17
Scholl motivation	-.15	-.13	-
Peer relations			
Youths from the same school with drug use	.15	.16	.12
Friends with consumption of alcohol and tobacco	.46	.44	.43
Friends with indiscipline and delinquent	.21	.13	.14
Youths from the same neighbourhood with delinquent behaviours and use of illegal drugs	.14	-	.11
Youths from the same neighbourhood that use tobacco and alcohol	.29	.29	.24
Friends with pro-social behavior	-.19	-	.12
Youths from the same neighbourhood with pro-social behavior	-.12	-	-
Neighbourhood relation			
Social support	-.11	-	-
Tobacco use motives			
Emotion regulation/self enhancement	.12	-	-
Achievement	.40	-	-
Socialization	.11	-	-
Alcohol use motives			
Emotion regulation/self enhancement/socialization	-	.38	-
Achievement	-	.18	-
Borrow relief	-	-.12	-
Marijuana use motives			
Emotion regulation	-	-	.21
Achievement and health	-	-	.20
Self enhancement/socialization	-	-	.15

Several statistically significant correlations emerged, ranging from .10 to .46. Stronger values were found for associations involving peers' deviant behaviour, expectations towards tobacco, alcohol and marijuana consumption, sensation seeking, academic achievement and parental monitoring practices.

Table 3- Pearson's correlation coefficients between independent variables and indicators of indiscipline, violence and crimes against property

	Indiscipline	Violence	Crimes against
Ethnicity	-	.14	-
Family problems			
Parental divorce	-	.10	-
Father addiction	.11	.15	.11
Father alcoholism	.12	.11	-

Parenting			
Monitoring	-.29	-.24	-.16
Support	-.16	-.14	-
School Involvement	-.16	-.11	-
Achievement values	-.16	-.12	-
Parent attitudes toward delinquent behaviour	.10	.10	-
Psychological control	.15	.15	.12
Behavioural control	-.10	-.11	-.12
Personality and social behaviour			
Sensation seeking	.30	.25	.19
Playfulness	-.16	-	-
Good delay of gratification	-.17	-.12	-.10
Behavioural coping	-.10	-	-
Impulsivity	.27	.21	.15
Anger/tension	.13	.15	-
Anger/violence	.34	.31	.23
School relation			
Academic achievement	-.32	-.26	-.21
Scholl motivation	-.11	-	-
Teacher's and school support	-.13	-.09	-.11
Peer Relations			
Peer support	-	-.11	-
Acceptance from peers	.10	.15	.12
Youths from the same school with drug use	.11	.16	.17
Friends with consumption of alcohol and tobacco	.26	.22	.16
Friends with indiscipline and delinquent behaviour	.45	.51	.38
Youths from the same neighbourhood with delinquent behaviours and use of illegal drugs	.19	.24	.16
Youths from the same neighborhood that use tobacco and alcohol	.15	-	-
Friends with pro-social behaviour	-.30	-.25	-.18
Youths from the same neighbourhood with pro-social behaviour	-.14	-.10	-
Neighbourhood relation			
Social support	-.16	-.14	-
Social control	-.10	-.11	-.12

Hierarchical Regression Analysis

Drawing on the previous results and in order to disclose the causal direction between variables, hierarchical regression analysis was carried out for each one of the response variables (tobacco, alcohol and marijuana consumption, indiscipline, violence and crimes against property), taking only those indicators flagged as the strongest correlations as explanatory variables.

In the first step, the variables with a more remote influence on risk behaviours were selected (personality structure, family issues, parental practices).

In the second step, only possible intervening variables between the first set of variables and the risk behaviours, that is to say, social skills were considered.

In the third step, the variables believed to impact more directly on drug consumption and anti-social behaviour (expectations toward consumptions, peers' influence and academic achievement) were further added to the model.

The results of the abovementioned regression analysis can be found on Tables A1 to A5 (see Appendix). Taken altogether, 19 to 38% of the variability of response variables on the sample is explained by the explanatory variables. Variables included on step one and step three of the regression analysis show strong predictable power.

CONCLUSIONS

A first conclusion we can draw from the results of this study, concerns the fact that the different forms of risk behaviours are strongly associated, assumption confirmed in different studies on this subject (Donovan & Jessor, 1985; Negreiros, 2001).

A second conclusion, concerns the existence of different risk and protection factors at a individual, family and social levels, common to the different risk behaviour considered, conclusion that once again aligns in the direction of the results found in the field of research carried out on this matter.

This conclusion leads to the need of privileging an intervention targeting the risk in adolescence issue, in a comprehensive, integrated way, able to take into account the cumulative effect of risk (Bartko, Baldwin, Baldwin & Seifer, 1999), since partial interventions targeted at a particular risk factor,

by itself, may not lead to expected results. This integrated approach does not invalidate, however, the need of taking into account the specificity of the factors identified at each level of analysis as assuming greater predictive power of the different risk behaviours.

Among these factors, and taking into account the variables that were the subject of this study, it can be referred, at the individual level, the tendency of young people with risk behaviours to seek strong sensations. Sensation seeking (need to experience new and exciting experiences, situations of danger and adventure; Zukerman, 1978), is one of the factors noted in various studies as a predictor of drug use (Tarter, Moss & Vanyukov, 1995; Zucker, 1994; Wills, Vaccaro & McNamara, 1992).

At the level of individual variables, it is also pointed out in the field of social and academic skills the fact that risk behaviours are associated with the lack of social skills, namely, poor self-control (impulsive behaviour, anger and difficulty to delay gratification), poor academic achievement and low commitment to school. Note that these skills are more correlated with antisocial behaviour than with the consumption of drugs.

Also in the field of individual factors, and more specifically in terms of expectations towards drug use, young people who consume more tobacco, alcohol and marijuana are the ones holding the most positive expectations regarding the consequences of consumption of these substances. The expectations towards the effects of drug use are one of the variables that present higher correlation with the consumption behaviour. This result converges with the findings of other studies that came into account with this predictor (Wills, Sandy, & Shin, 1999; Wills, Sandy, & Yaeger, 2002). Among these positive expectations it is pointed out the possibility of drugs playing a positive role in the regulation of emotions (reduction of the malaise associated with the psychological states of anxiety, anger, sadness and induction of states of relaxation), self enhancement and self confidence and finally, the function of consumption of these substances in facilitating the socialization and relationship with the other. Conversely, young people who have more negative expectations about the consumption of tobacco, alcohol and marijuana are those with lower levels of consumption of these

substances. Of note, only for the consumption of tobacco, negative expectations assume greater predictive weight for consumption of this substance, than positive expectations (this result does not concern, however, the effects of the consumption in physical health but as regarding the possibility of tobacco to constrain the achievement of future goals). Therefore it seems that both the young consumers and non-consumers have similar beliefs about the consequences of smoking to physical health. Regarding the consumption of alcohol, positive expectations are more determinants than negative expectations on the distinction between consumers and non-consumers and, in the consumption of marijuana, the weights of negative and positive expectations become more proximal.

With regard to family factors, we found some positive correlations, though reduced, among certain family problems and young people's risk behaviour, being the mother's depression more critical for drug use and drug addiction and alcoholism of father more critical for anti-social behaviour and the separation of parents to the sexual risk behaviour. In the domain of parenting, monitoring practices appear to be the factor with greater weight in the protection of risk behaviour, then comes involvement of parents in school tasks and expectations and values of achievement towards school and, finally, is the acceptance and support of parents (this negative associations are stronger for anti-social behaviour). In the opposite direction, practices characterized by withdrawal of love as a form of punishment and permissiveness, are positively associated with risk behaviour, particularly with regard to anti-social behaviour (indiscipline, violence, crimes against property).

Regarding peers relationship, the results of this study point out to the fact that the association to friends with deviant behaviour and the perception of school and neighbourhood environments marked by young people with deviant behaviour are strongly associated with the consumption of drugs and anti-social behaviour of young people. The influence of peers, appears therefore to constitute itself as one of the factors, in addition to the expectations towards drug use, more decisive in the explanation of deviant behaviour (these results align themselves once more with the findings of

other studies that included this factor among the set of predictive variables; Wills, Sandy & Yaeger, 2002; Wills, Sandy & Shin, 1999). Of note, that most of the more distal factors, at the level of parental attitudes and practices, problematic in families, also appear correlated with the tendency of young people to be associated with deviant peers. The association with deviant peers may therefore play a mediator role of the effects of these more distal factors in behaviour.

Finally, and with regard to socio-demographic factors analyzed in this study, we are highlighting the significant differences found in levels of consumption of tobacco, alcohol and marijuana and antisocial behaviour associated with gender. Girls presented higher prevalence of tobacco use and boys higher levels of consumption of alcohol and marijuana. Boys also show considerably more anti-social behaviour than girls. Also to emphasize the influence of ethnic group regarding the consumption of marijuana, and for violence and sexual risk behaviour. Noting that African youths consume less marijuana than Caucasian, but they tend to engage in more anti-social behaviours, particularly physical violence and to engage themselves in sexual risk behaviour.

References

- Barber, B. K.; Olson, J. E. & Shagle, S. C. (1994). Associations between parental psychology and behavioural control and youth internalized and externalized behaviors. *Child development*, 65, 1120-1136 [pp. 1125].
- Bryant, A. L. & Zimmerman, M.A. (2002). Examining the effects of academic beliefs and behaviours on changes in substances use among urban adolescents. *Journal of Educational Psychology*, 94(3), 621-637 [pp.626].
- Donovan, J. E., & Jessor, R. (1985). Structure of problem behavior in adolescence and young adulthood. *Journal of Consulting and Clinical Psychology*, 53, 890-904.
- Galambos, N. L.; Barker, E. T. & Almeida, D. M. (2003). Parents to matter: Trajectories of change in externalizing and internalizing problems in early adolescence. *Child Development*, 74, 578-594

- Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin*, 112, 64-105.
- Losel, F., & Bliesener, T. (1994). Some high-risk adolescents do not develop conduct problems: A study of protective factors. *International Journal of Behavioral Development*, 17, 753-777.
- Nash, J. K., & Bowen, G. L. (1999). Perceived crime and informal control in the neighbourhood as a context for adolescent behavior: A risk and resilience perspective. *Social Work Research*, 23, 171-186
- Negreiros, J. (2001). *Delinquencias juvenis*. Lisboa: Editorial Noticias Paulson, S. E.
- (1996). Maternal employment and adolescent achievement revisited: An ecological perspective. *Family Relations*, 45, 201-208.
- Sameroff, A. J. (1999). Ecological perspectives on developmental risk. In J. D. Osofsky & H. E. Fitzgerald (Eds.), *WAIMH Handbook of infant mental health: Vol. 4. Infant mental health groups at risk* (pp. 223-248). New York: Wiley.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2001). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin.
- Wills, A. T.; Sandy, M. J. & Shinar, O. (1999). Cloninger's constructs related to substance use level and problems in late adolescence: A mediational model based on self-control and coping motives. *Experimental and Clinical Psychopharmacology*, 7, 122-134.
- Wills, A. T.; Sandy, M. J. & Yarger, A. M. (2002). Moderator of the relation between substance use level and problems: Test of a self-regulation model in middle adolescence. *Journal of Abnormal Psychology*, 111(1), 3-21 [pp.7].
- Wills, T. A., Gibbons F. X., Gerrard, M., Murry, V. M., & Brody, G. H. (2003). Family communication and religiosity to substance use and sexual behavior in early adolescences: A test for pathways through self-control and prototype perceptions. *Psychology of Addictive Behaviors*, 17, 312-323.
- Wills, T. A., Windle, M., & Cleary, S. D. (1998). Temperament and novelty-seeking in adolescent substance use: Convergence of dimensions of temperament with constructs from Cloninger's theory. *Journal of Personality and Social Psychology*, 74, 387-406.

APPENDIX

Table A1. Tobacco consumption in function of parenting, sensation seeking, self control peer relations, school relation drug use motives: hierarchical regression analysis (N = 1042)

Predictor	r	Coefficients beta and probabilities						Multiple correlation	R2 Change
		Step 1		Step 2		Step 3			
		β	p	β	p	β	p		
Step 1								R= .42 p=.000 R ² = .18 R ² _{ajust} =.18	R ² _{change} = .18 p< .000
Mather depression	.11	.07	.012	.06	.024	.05	.040		
Parental attitudes toward drug use	.28	.26	.000	.26	.000	.10	.000		
Monitoring	-.23	-.15	.000	-.10	.002	-.07	.029		
School involvement	-.17	-.10	.001	-.09	.003	-.03	.250		
Sensation seeking	.25	.18	.000	.14	.000	.04	.131		
Step 2								R= .45 p=.000 R ² = .20 R ² _{ajust} = .19	R ² _{change} = .02 p< .000
Good delay of gratification	-.19			-.04	.171	.02	.487		
Calm	-.14			-.06	.072	-.04	.166		
Impulsivity	.19			.06	.050	.06	.037		
Anger/tension	.16			.03	.333	.01	.780		
Anger/violence	.20			.05	.133	.08	.006		
Step 3								R= .60 p=.000 R ² = .36 R ² _{ajust} = .35	R ² _{change} = .16 p< .000
Positive motivation to tobacco use /achievement	.40					.27	.000		
School achievement	-.22					-.07	.012		
School motivation	-.14					-.05	.070		
Friends with alcohol and tobacco use	.46					.24	.000		
Youths from the same neighborhood that use alcohol and tobacco	.29					.06	.055		
Friends with pro-social behavior	-.19					-.02	.535		

Table A2 – Alcohol consumption in function of parenting, sensation seeking, self control peer relations, school relation, drug use motives: regression analysis (N = 1042)

	r	Coefficients beta and probabilities						Multiple correlation	R ² Change
		Step 1		Step 2		Step 3			
		B	p	β	p	β	p		
Step1								R= .44 p=.000 R ² = .20 R ² _{ajust} = .19	R ² _{change} = .20 p< .000
Mather depression	.10	.06	.031	.06	.042	.04	.121		
Parental attitudes toward drug use	.33	.30	.000	.29	.000	.14	.000		
Monitoring	-.19	-.13	.000	-.11	.001	-.05	.075		
Sensation seeking	.30	.24	.000	.22	.000	.11	.000		
Step 2								R= .45 p=.10 R ² = .20 R ² _{ajust} = .20	R ² _{change} = .01 p< .000
Good delay of gratification	.14			-.04	.152	.00	.887		
Impulsivity	.15			.02	.477	.03	.344		
Anger/tension	.16			.00	.908	.01	.825		
Anger/violence	.12			.05	.154	.02	.543		
Step 3								R= .57 p=.000 R ² = .32 R ² _{ajust} = .32	R ² _{change} = .12 p< .000
Positive motives to Alcohol use (emotion regulation/self enhancement/socialization)	.38					.22	.000		
Positive motives to Alcohol use/achievement	.18					.10	.000		
School achievement	-.14					-.02	.449		
Youths from the same school with drug use	.16					-.01	.698		
Friends with alcohol and tobacco use	.44					.23	.000		
Youths from the same neighborhood that use alcohol and tobacco	.29					.07	.031		

Table A3 – Marijuana consumption as a function of parenting, sensation seeking, self control, peer relations, school relation, drug use motives: regression analysis (N = 1042)

Predictor	r	Coefficients beta and probabilities						Multiple correlation	R ² Change
		Step 1		Step 2		Step 3			
		β	p	β	p	β	p		
Step 1									
Mather addiction	.11	.21	.009	.07	.013	.083	.002	R= .35 p=.000 R ² = .12 R ² _{ajust} = .12	R ² _{change} = .12 p< .000
Monitoring	-.22	.20	.000	-.15	.000		.014		
Parents attitudes toward drug use	.23	-	.000	.21	.000	.076	.010		
Parent's achievement values	-.10	.43	.644	-.01	.842		.318		
Sensation seeking	.21	.24	.000	.13	.000	.047	.134		
Step 2									
Playfulness	-.13			-.02	.553		.753	R= .36 p=.186 R ² = .13 R ² _{ajust} = .12	R ² _{change} = .01 p< .000
Good delay of gratification	-.15			-.04	.332	.006	.877		
Impulsivity	.15			.05	.138	.037	.222		
Anger/Tension	.12			-.01	.800		.329		
Step 3									
Positive motivation to Alcohol use (emotion regulation)	.21					.104	.000	R= .51 p=.000 R ² = .26 R ² _{ajust} = .25	R ² _{change} = .13 p< .000
Positive motivation to Alcohol use (achievement and health)	.20					.130	.000		
Scholl achievement	-.17						.034		
Friends with alcohol an tobacco use	.43					.322	.000		
Youths from the same neighborhood that use alcohol and tobacco	.24					.030	.341		
Friends with pro-social behavior	-.11					.059	.052		

Table A4 – Indiscipline as a function of parenting, sensation seeking, self control, peer relations, school relation: regression analysis (N = 1042)

Predictor	r	Coefficients beta and probabilities						Multiple correlation	R ² Change
		Step1		Step 2		Step 3			
		β	p	β	p	β	p		
Step 1								R= .42 p=.000 R ² = .18 R ² _{adjust} = .17	R ² _{change} = .18 p< .000
Father addiction	.11	-.32	.051	.047	.104	.03	.203		
Father alcoholism	.12	.16	.008	.083	.004	.07	.009		
Monitoring	-.29	.45	.000		.000	-.04	.307		
Parental support	-.16	.26	.005	.102	.013	.04	.337		
Parental School involvement	-.16	.19	.055		.063	-.02	.633		
Psychological control	.15	.15	.006	.010	.752	.01	.860		
Parent's achievement values	-.16	-.30	.009	-.070	.040	-.01	.813		
Sensation seeking	.30	.24	.000	.146	.000	.09	.002		
Teacher support	-.13	-.32	.000		.000	-.08	.003		
Step 2								R= .47 p=.000 R ² = .22 R ² _{adjust} = .21	R ² _{change} = .05 p< .000
Playfulness	-.16				.735	-.02	.520		
Good delay of gratification	-.17			.000	1.000	.05	.152		
Impulsivity	.27			.094	.003	.09	.004		
Anger / violence	.34			.165	.000	.11	.001		
Step 3								R= .58 p=.000 R ² = .33 R ² _{adjust} = .32	R ² _{change} = .11 p< .000
Academic achievement	-.32					-.15	.000		
Youths from the same school with indiscipline and delinquent behaviour	.16					-.04	.230		
Friends with indiscipline and delinquent behaviour	.45					.25	.000		
Friends with alcohol an tobacco use	.26					.03	.431		
Friends with pro-social behavior	-.30					-.08	.011		
School failure	.24					.07	.013		

Table A5 – Violence as a function of parenting, sensation seeking, self control peer relations, school relation: regression analysis (N = 1042)

Predictor	r	Coefficients beta and probabilities						Multiple correlation	R ² Change
		Step 1		Step 2		Step 3			
		β	p	β	p	β	p		
<i>Step 1</i>								R= .37 p=.000 R ² = .14 R ² _{ajust} = .13 R ² _{change} = .14 p< .000	
Father alcoholism	.11	.05	.121	.05	.071	.03	.266		
Father addiction	.15	.11	.000	.10	.001	.09	.002		
Ethnicity	.14	.12	.000	.11	.000	.03	.262		
Monitoring	-.24	-.17	.000	-.13	.001	-.01	.775		
Parental support	-.13	.06	.110	.05	.159	.00	.895		
Psychological control	.15	.10	.001	.04	.224	.03	.341		
Parent's achievement values	-.12	-.04	.275	-.02	.625	.03	.286		
Sensation seeking	.25	.20	.000	.13	.000	.06	.058		
<i>Step 2</i>								R= .41 p=.000 R ² = .17 R ² _{ajust} = .16 R ² _{change} = .03 p< .000	
Good delay of gratification	-.12			-.01	.789	.04	.210		
Impulsivity	.21			.07	.040	.04	.183		
Anger/Tension	.15			.02	.616	.00	.870		
Anger / violence	.31			.18	.000	.10	.002		
<i>Step 3</i>								R= .57 p=.000 R ² = .32 R ² _{ajust} = .31 R ² _{change} = .15 p< .000	
School failure	.22					.07	.010		
Academic achievement	-.26					-.09	.002		
Youths from the same school with indiscipline and delinquent behavior	.14					-.09	.002		
Friends with indiscipline and delinquent behavior	.51					.39	.000		
Friends with alcohol an tobacco use	.22					.01	.783		
Youths from the same neighborhood With delinquent behavior	.24					.05	.076		
Friends pro/social behaviour	-.25					-.04	.153		