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Working Paper, July, 2013

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ASSOCIATED RISK AND PROTECTIVE FACTORS**

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La Paz – Bolivia

2013

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ABSTRACT

Alcohol consumption prevalence in Bolivia is one of the highest in the region and the most degrading practices faced by the society. To apply the changes, social policy makers require objective, accurate, and complete information about the factors that could be considered both guards and risky. Hence, links between socio-demographics, family, personal/behavioral and social variables and youth alcohol use were analyzed in order to know their particular contributions to explanation of drinking behavior. The study was carried out with a sample of 1023 young students (13 to 23 years old), of both sexes (515 male and 508 female) recruited from local high schools and university initial undergraduate courses. The results showed strong ties between such variables and adolescent alcohol drinking behavior. The predictive model (linear regression model) fitted relatively well including variables such as age, parental monitoring, father-adolescent relationship, peer pressure, antisocial behavior and risk perception. Nevertheless, only social and parental variables proved a good fit with the empirical data when a theoretical model was proposed through a structured equation modeling. Although this model seems to be in good shape, it should be adjusted to a more comprehensive approach to a risk/protection conceptual framework.

KEYWORDS: Risk factors, protective factors, alcohol use, prediction model, theoretical model.

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Social policy makers are mainly interested in having a complete picture about the social, cultural, economic and psychological factors impacting vulnerable population sectors such as children, adolescents, women and elderly. Their work requires objective, precise and comprehensive information on those variables that actually enhance poverty and reduce well-being.

Alcohol abuse is one of the most well-known personal and social degrading practices, it surely impacts social and family relationships, job stability at the workplace, and endanger lives beyond the person who suffers from this condition. The toll it takes on a person's health and the emotional damage inflicted on others can be devastating and life threatening.

Alcohol abuse is of special concern in our society, due to direct association with major physical and mental health problems. Alcohol consumption prevalence in Bolivia is among the highest in the region, a recent nationwide study (n = 14.166) has shown that life prevalence is 77.2%, annual prevalence is 59.1% and monthly prevalence 36.7%. A university study carried out by the Andean Community in cooperation with IACD and the Vice ministry of Social Defense has shown that life prevalence of alcohol use is 77.6%, annual alcohol consumption prevalence is 57.6% and monthly prevalence is 35.1%. Out of those that declared to have drunk during the last year (57.6%), 38.7% has shown to have risky or harmful consumption, and 17.3% has shown to have alcohol dependence.

These figures and recent alcohol related events: increased traffic accidents, increased public safety problems have sparked overall general concern in Bolivian society. Public opinion has force the ruling government to adopt and pass several alcohol oriented legislation to cope with the problem. The number of alcohol related deaths due to traffic accidents is extremely high and domestic violence figures show a close relationship with alcohol consumption.

Therefore, the study of determinant factors of alcohol abuse would provide to policy makers with conceptual bases to make decisions and develop preventive or remedial strategies oriented to reduce incidence of alcohol abuse in our societies lowering at the same time, the occurrence of all related problems.

A risk factor is a variable that significantly predicts whether an individual will develop disorder or disease. According to Mrazek and Haggerty (1994), to qualify as a risk factor, “a variable must be associated with an increased probability of disorder and must antedate the

onset of disorder” (p. 129). “It is a measurable characterization of each subject in a specified population that precedes the outcome of interest and which can be used to divide the population into two groups: the high-risk and the low-risk groups that comprise the total population” (Kraemer and Kazdin, 1997, p. 338).

Specialized literature (Donovan, 2004), identify several factor or group of factors, variables or conditions highly correlated with alcohol abuse and that could be generically defined as risk factors. The author points out at least five inclusive categories of risk factors: socio-demographic, family domain, peer domain, personality domain, and behavioral domain.

Socio-demographic Risk Factors. In the first category, we usually find variables such as gender, age, ethnic background, and socioeconomic status as potential risk factors for alcohol consumption onset. **Information concerning many of these variables is derived primarily from descriptive epidemiology, using cross-sectional surveys that rely on aggregate analyses. Findings recommend careful interpretation of these indicators since isolated analysis could drive to limited conclusions.** For example, studies intending to show differences between male and female concerning initiation of alcohol drinking were statistically non-significant (Beck et al, 1999).

Family Risk Factors. During the last decades, the family influences literature on child and adolescent behavior occupied the central attention of developmental specialists around the world. Family variables that have been found to predict alcohol drinking onset fall into three general categories: a) family composition; b) parental or sibling modeling and approval of drinking; and c) parenting and parent-child relationship.

In spite of this classification, family variables seem to be of central importance to explain pro-social as well as antisocial behavior of youngsters. In the last domain, family background like instability, carelessness, lack of support and warmth, violence and conflict, poor discipline practices, parent-youth relation difficulties, lack of control among other related problems, have been consistently associated with children and adolescent antisocial deviant behavior (Jacob and Johnson, 1997).

Although we are aware of multi-causality of substance abuse behavior, special attention has to be dedicated to adolescent alcohol and drug abuse behavior as determined by family patterns.

Several authors have stressed the relation between early and late alcohol consumption and family deviant conduct (Jacob and Leonard, 1994; Beck et al., 1999; Brook, et al., 2005, Hofstra, et al., 2000; Moran et al., 2004; McGue and Iacono, 2005; Hayes, Smart Toumbourou and Sanson, 2004). Some studies remarked ties between child maltreatment and preteen alcohol abuse (Hamburger et al., 2008, Ireland, et al., 2002; Chen, Propp, Lara and Corvo, 2011) and other, reported children maltreatment and neglected as predictors of substance abuse (Widom, et al.1995; Mullings, et al., 2004).

It is also important to stress the great cultural influence family has on Latino people on their way of life; on the way they take their personal decisions and orienting in how to solve their problems and face the difficulties. Families in Bolivia play an important role as support network for social, economic, psychological and other aspects of life pursuits. When this support fails, defenselessness increases the probability of maladaptive behavior.

Positive familial relationship, high family cohesion, interdependence for daily activities and proximity among their members, are values that strengthen and blind them from adversities (Romero y Ruiz, 2007; Cuellar, Arnold and Gonzales, 1995; Sabogal et al., 1987). Many studies reported inverse relation between “familism” and youth alcohol abuse (Gil, Wagner and Vega, 2000) showing the need of further research on characteristics of behavior family patterns and parenting of adolescent under substance abuse situation.

Peer Risk Factors. Another source of potential vulnerability originates from the peer relationship domain. According with Donovan (2004), most peering variables having potential drinking onset reflect several risk factors: involvement in delinquent or drug-using behaviors or perceived peer attitudes toward drug use, rather than more qualitative aspects of adolescent-peer relationships. Several studies have shown that peer alcohol use and peer marijuana use were two of the three most significant predictors of the initiation of alcohol use (Ellickson and Hays, 1991; Graham, Marks and Hansen, 1991; Marks, Graham and Hansen, 1992).

Personal Risk Factors. Donovan (2004) describes personality risk factors as personal attributes or traits such as “values, beliefs, and expectancies in addition to temperament factors and affective disorder factors (depression, anxiety, internalizing disorders). The onset

of drinking among abstainers is signaled in this literature by antecedent personality attributes reflecting lower levels of conventionality, greater negative affectivity, greater behavioral under-control, and higher alcohol expectancies” (p. 533).

Behavioral Risk Factors. There are at least three behavioral indicators consistently associated with the alcohol drinking onset among adolescents: previous peer involvement in antisocial (particularly delinquent) behavior (Webb, Baer and McLaughlin,1991), peer academic performance (McGue, Iacono and Legrand, 2001), and peer alcohol and drug abuse. Other behavioral indicators include parenting patterns or behaviors like monitoring or control, knowledge² and discipline (Romero y Ruiz, 2007), all of them associated with fewer psychosocial risk; type of parent-adolescent relationship (parent attachment) and quality of communication (with guiding purposes) among family members.

The aim of this paper is to identify some empirical links emerging from the investigation of some relationships between demographic, family, behavioral and social indicators with alcohol use of young people in Bolivia. The authors were also interested in exploring some preventive potentials of combining these factors in order to build a predictive and explicative model of early alcohol drinking in adolescents.

In this study the authors were interested in responding the following matters by examining whether there was a systematic association between: a) parental variables (control or monitoring), quality of mother/father-adolescent relationship and communication) and adolescent alcohol drinking behavior; b) social variables (antisocial behavior and peer pressure) and adolescent alcohol drinking behavior; c) demographic variables (age and gender) and adolescent alcohol drinking behavior; d) personal variables (personal values, risk perception, academic achievement and personal beliefs), and adolescent alcohol drinking behavior. Likewise, it is our interest to identify which of the above variables could predict high levels of alcohol drinking among adolescents.

² Knowledge defined by Patterson et al., (1989) as parent awareness of the whereabouts of teenagers when they are not in their homes.

METHOD

Sample and Participants. A convenience sample of 1023 young students (13 to 23 years old) were recruited from local high schools and initial university undergraduate courses; 508 were female (49.7%) and 515 male (50.3%), with an age mean of 18.84 and standard deviation of 2.226. All participants were informed about the nature and purposes of the study and experimenters received their voluntary consent before applying the data gathering procedures. Additional consent was obtained from directive personnel of educational institutions. The socioeconomic family context of participants can be characterized as middle class citizen, residents of the city of La Paz, Bolivia.

Variables. The variables considered in the present research were the following:

Socio-demographics: age and gender.

Family: Parental monitoring, mother-adolescent relationship, father-adolescent relationship, mother-adolescent communication and father-adolescent communication.

Personal/behavioral: personal values, risk perception, self-efficacy beliefs, academic achievement and alcohol use.

Social: Peer pressure and Anti-social behavior.

Measures. The survey was conducted through the application of several scales which took approximately one hour to complete. All scales were administered in Spanish during a regular class period. All participants offered socio-demographic and educational information.

Parental Monitoring Scale (PCS). This six item, Likert style scale with 5 response options (1 = never and 5 = always), measured youth perception of parent control and monitoring behavior. Reliability information of PCS reported a Cronbach Alfa = .805 and the construct validity through exploratory factor analysis (extraction method of Principal Components) revealed a mono-factorial scale structure, explaining the 50.7 per cent of the variance with saturation indices above .648. Regarding to Confirmatory Factor Analysis (CFA), calculated through Structural Equation Modeling with SPSS-AMOS, the proposed model was capable to estimate successfully all its parameters. Nevertheless, the assessment of multivariate sample

distribution reported a slight lack of normality (13.609) and the Mahalanobis Distance Test informed the existence some observations farthest from the centroid. The PCS model fitted quite well with the following indicators: Baseline Comparisons (NFI = .984; RF I = .960; IFI = .987; TLI = .967 and CFI = .987) showing a very well-adjusted model. The Root Mean Square Error of Approximation (RMSEA = .066) being greater than .05. This information did not confirm a good fit of PCS model (Byrne, 2010; Roth, 2012).

Mother-Adolescent Relationship (M-AR): This four item scale, with five response options, intended to measure adolescent perception of their personal relationship with the mother. Reliability information of M-AR reported a Cronbach's Alfa = .878 (n =1023), and the construct validity through exploratory Factor Analysis (extraction method of Principal Components) revealed good conditions for factorial analysis (KMO =.832; and Bartlett's test $X^2 = 2106.7 = p < .000$). The Factorial Analysis recommended a mono-factorial scale structure, explaining the 73.34 per cent of the variance, with saturation indexes above .678. Regarding to Confirmatory Factor Analysis (CFA), calculated by SPSS-AMOS, the model estimated successfully all its parameters: We found all standardized regression weights to be above .762. Nevertheless, the assessment of multivariate sample distribution reported a lack of normality with a negative skewnes, but with an adequate kurtosis multivariate value (6,921). The Mahalanobis Distance Test informed the existence of some observations farthest from the centroid. The M-AR model fitted quite well with respect to the following indicators: CMIN = .439, $p = .508$, suggesting good fit null hypothesis not to be rejected. Additionally, Baseline Comparisons (NFI = .999; RF I = .999; IFI =.999; TLI = .999 and CFI = .999) showed a very well-adjusted model. The Root Mean Square Error of Approximation (RMSEA = .000), being less than .05 value, also confirmed the good fit of M-AR model.

Father-Adolescent Relationship (F-AR): This construct was measured with a four item and five response options. Reliability information of F-AR reported a Cronbach's Alfa = .893 (n =1023), and the exploratory Factor Analysis (extraction method of Principal Components) revealed good conditions for factorial analysis (KMO =.817; and Bartlett's test $X^2 = 2413.187 = p < .000$). The Factorial Analysis recommended a mono-factorial scale structure, explaining the 75.81 per cent of the variance, with saturation indexes above .712. The Confirmatory

Factor Analysis (CFA) successfully estimated all model parameters and standardized regression weights were well-adjusted and significant (with values above .759). The assessment of multivariate sample distribution reported a lack of normality and the Mahalanobis Distance Test confirmed the existence of some observations farthest from the centroid. The F-AR model fitted quite well in respect the following indicators: CMIN = .056, $p = .813$, suggesting the model's good fit null hypothesis not to be rejected. Additionally, Baseline Comparisons (NFI = 1.000; RF I = 1.000; IFI = 1.000; TLI = 1.000 and CFI = 1.000) showed a very well-adjusted model. The Root Mean Square Error of Approximation (RMSEA = .000), having been less than .05 value, also confirmed the good fit of F-AR model.

Risk Perception (RPS): This twelve item scale with five response options, intended to measure the amount of risk that adolescents perceive as consequence of regular substance use (tobacco, alcohol, marihuana and cocaine). Reliability information of RPS reported a Cronbach Alfa = .900 (n = 1023). The construct validity through exploratory Factor Analysis (extraction method of Principal Components) revealed good conditions for factorial analysis (KMO = .835; and Bartlett's test $X^2 = 8067.9 = p < .000$). The Factorial Analysis recommended a three-factor scale structure (short term risk, medium term risk and long term risk), explaining the 72.746 per cent of the variance, with saturation indexes above .653. The Confirmatory Factor Analysis (CFA), calculated through SPSS-AMOS, had problems to confirm RPS as a good model. Although the Comparison Baselines estimates achieved an acceptable level (NFI = .917; RF I = .860; IFI = .922; TLI = .867 and CFI = .921), the CMIN and RMSEA indices were clearly insufficient. Therefore, it will be necessary to go deeper in order to get a better model to measure Risk Perception.

Antisocial Behavior (ASBS). The ASBS is a 16 items instrument with five response options (1 = never and 5 = always) to measure antisocial behavior (lying, stealing, and cheating). Reliability information of ASBS reported a Cronbach's Alfa = .935 (n = 1023). The construct validity through exploratory Factor Analysis (Principal Component's extraction method) revealed good conditions for factorial analysis (KMO = .958; and Bartlett's test $X^2 = 12206.5 = p < .000$). The Factorial Analysis results recommended a mono-factorial scale structure, explaining 53 per cent of the variance, with saturation indexes above .319. Confirmatory

Factor Analysis (CFA), estimated successfully all its parameters. Nevertheless, as was expected when we assessed this kind of atypical behavior, multivariate sample distribution showed a lack of normality. The ASBS model fitted quite well with the following indicators: Baseline Comparisons (NFI = .942; RF I = .924; IFI =.949; TLI = .934 and CFI = .949) showing the model's good shape. The Root Mean Square Error of Approximation (RMSEA = .081) showed to be less than .05, which also confirms an adequate fit of the ASBS model.

Conservatism Personal Values (CPV). This 13 item scale with six response options is part of the Schwartz PVQ forty item's scale (Schwartz, 1992). The scale is intended to measure whether a person identifies with behaviors and attitudes related to the submission, preservation of traditional practices, and protection of personal stability. Reliability information of CPV reported a Cronbach Alfa = .874 (n =1023). The construct validity through exploratory Factor Analysis (extraction method of Principal Components) revealed good conditions for factorial analysis (KMO =.922; and Bartlett's test $X^2 = 4020.142 = p < .000$). The Factorial Analysis recommended a two-factor scale structure (tradition and security values), explaining the 48.175 per cent of the variance, with saturation indexes above .506.

Filial Self-Efficacy Beliefs (FSEB): Is a 10 item, Likert like scale with 7 response options (1 = incapable and 7 = completely capable), measured adolescent personal beliefs on their particular capabilities to handle successfully family affairs. Reliability information of FSEB reported a Cronbach's Alfa = .916. The construct validity through exploratory factor analysis (extraction method of Principal Components) reported good conditions for factorial analysis (KMO =.939; and Bartlett's test $X^2 = 5455.0 = p < .000$). The Factorial Analysis recommended a mono-factorial scale structure, explaining the 57.18 per cent of the total variance, with saturation indexes above .697. Regarding Confirmatory Factor Analysis (CFA), calculated by SPSS-AMOS, the model estimated successfully all its parameters: All standardized regression weights were above .666 and statistically significant. Nevertheless, the assessment of multivariate sample distribution reported a lack of normality expressed in the Mahalanobis Distance Test (d^2), showing the existence of observations farthest from the centroid. Concerning to CMIN's FSEB model indicator, it was not possible to accept the

hypothesis of adequate fit (CMIN/df = 3.271, $p = .000$). Nevertheless, other fit indexes like Baseline Comparisons (NFI = .973; RF I = .961; IFI = .979; TLI = .969 and CFI = .979) indicated a very well-adjusted model. The Root Mean Square Error of Approximation value (RMSEA = .047), has shown to be less than .05, also confirming the adequate fit of FSEB model.

Peer Pressure Scale (PPS): The PPS was constructed with 14 items and five response options (1 = Total disagreement and 5 = Total agreement) to measure peer influence. Reliability information of PPS reported a Cronbach's Alfa = .617 ($n = 1023$). The construct validity through exploratory Factor Analysis (Principal Component's extraction method) revealed good conditions for factorial analysis (KMO = .907; and Bartlett's test $X^2 = 7707.29$, $p < .000$). The Factorial Analysis recommended a two factor structure for PPS, explaining 60.08 per cent of the variance, with saturation indexes above .679. Confirmatory Factor Analysis (CFA), estimated successfully all its parameters. However, multivariate sample distribution showed a lack of normality. The PPS model fitted quite well with the following indicators: Baseline Comparisons (NFI = .971; RF I = .959; IFI = .979; TLI = .970 and CFI = .979) showing a well fitted model. The Root Mean Square Error of Approximation (RMSEA = .049) value, less than .05, also confirmed the good fit of PPS model. The Factor Analysis recommends a bi-factorial structure with seven items for resistance and seven for compliance.

Self-Perceived Academic Achievement (SPAA): As we were also interested in academic performance of adolescents, this indicator was measured through a single item reflecting their academic achievement perception: 1 = much better than the average, 2 = just better than the average, 3 = the average, 4 = just lower than the average, 5 = worse than the average.

Alcohol Use Scale (AUDIT). This 10 item scale with 5 response options (1 = never and 5 = Always), measured adolescent self-report of alcohol consumption. Reliability test of *AUDIT* reported a Cronbach's Alfa = .905. The construct validity through exploratory factor analysis (extraction method of Principal Components) reported good conditions for factorial analysis (KMO = .940; and Bartlett's test $X^2 = 5226.16 = p < .000$). The Factorial Analysis recommended a mono-factorial scale structure, explaining the 55.65 per cent of the total

variance, with saturation indexes above .531. With respect to Confirmatory Factor Analysis (CFA), the model estimated successfully all its parameters: Regression weights above .461 were found and all were statistically significant. Nevertheless, the assessment of multivariate sample distribution reported a lack of normality. Concerning to CMIN's AUDIT model indicator, some adjustment problems were reported (CMIN/df = 2.775, p = .000). This value does not allow accepting the model's good fit hypothesis. Nevertheless, other good-fit indexes like Baseline Comparisons (NFI = .984; RFI = .976; IFI = .990; TLI = .985 and CFI = .990) indicated a very well-adjusted model. The Root Mean Square Error of Approximation (RMSEA = .042), has shown to be less than .05 value, also confirmed the good fit of FSEB model.

Table 1. Statistical data of different measures in the present study

Scale	Source	Items	Mean	SD	Cronbach α	EFA Explained Variance	CFA Model Fit		
							CMIN	Base Line Comparison	RMSEA
PCS	IICC (2013)	6	20,7576	5,75	.805	50.70%	P = .000	CFI = .987	P = .066
M-AR	CIPRSGS (2004)	4	31,3959	8,06	.878	73.34%	p = .508	CFI = .999	P = .000
RPS	IICC (2013)	12	38,2903	10,57	.900	72.74%	p = .000	CFI = .921	P = .000
ASBS	CIPRSGS (2004)	16	32,3988	12,56	.935	53.00%	p = .000	CFI = .949	P = .081
CPV	Schwartz (1992)	13*	49,2815	11,67	.874	48.17%	---	---	---
FSEB	Caprara (2001)	10	43,0147	12,04	.916	57.18%	p = 3.271	CFI = .979	P = .047
APS	IICC (2013)	14	43,3695	6,57	.617	60.80%	p = .000	CFI = .979	P = .049
SPAA	Kellog Foundation	1	2,73	,916	--	--	--	--	---
AUDIT	OMS/OPS (2001)	10	20,3568	8,35	.905	55.65%	p = 2.775	CFI = .990	P = .042

n = 1023

*PVQ Conservatism personal value subscale

Analysis Strategy.

After confirming both, the reliability and validity of the measurement instruments, each research question was tested proving the relationship between each variables through inter correlation calculation. These were also compared with the amount of alcohol consumption when the related variables varied in two dimensions. Afterwards, a linear regression procedure was designed in order to identify variables with alcohol abuse prediction potential. Finally, a structured equation modeling was implemented in order to test a theoretical proposal in which the latent variables corresponded to those studied with linear multiple regression analysis. In all cases, SPSS software was used, except for the structural equation modeling which used AMOS.

RESULTS.

Descriptive Statistics: Table 2, shows descriptive information regarding gender and age variables. The sample was composed by 50.34 % of males and 49.66 % of females. The sample was divided in two age groups in the following ranges: 13 to 17, representing 29.22 % and 18 to 23, 29.22 %).

Table 2. Gender, age and alcohol consumption level of the sample.

Variable/Category	Low Consumption (N=724)		High Consumption (N=229)		Total (N=1023)		High/Low Consumers
	n	%	n	%	n	%	
	Gender:						
Male	353	51.2	162	54.2	515	50.34	$X^2 = 2.490^*$
Female	371	48.8	137	45.8	508	49.66	
Age:							
13-17 years old	246	34.0	53	17.7	299	29.22	$X^2 = 27.021^{**}$
18-23 years old	478	66.0	246	82.3	724	70.78	

* $p = .066$

** $p = .000$

The participants of this study were also divided into two wide categories: low (n = 724, 70.77 %) and high (n = 299, 29.23 %) alcohol consumers. All variables of the study were analyzed confronting both levels of drinking patterns. Table 2, exhibits the results of the analysis showing no gender differences. Nevertheless, significant differences in alcohol consumption between age groups were observed.

Table 3. Descriptive cross tabulation analysis of all studied variables, grouped by type, high and low alcohol consumption values, obtaining X^2 and Odd Ratio indices.

Variable	Low Consumption (N=724)		High Consumption (N=229)		Total (N=1023)		
	n	%	n	%	n	%	
	Family/Parental:						
High Parental control	525	76.3	163	23.7	688	67.25	$X^2 = 31.127^{***}$ $OR = .454$
Low Parental control	199	59.4	136	40.6	335	32.75	
Total	724		299		1023	100.0	
High good Mother Relation	395	79.5	102	20.5	497	48.58	$X^2 = 35.407^{***}$

Low good Mother Relation	329	62.5	197	37.5	526	51.42	<i>OR = .431</i>
Total	724		299		1023	100.0	
High good Father Relation	348	71.5	139	28.5	487	47.80	$X^2 = .288$
Low good Father Relation	372	69.9	160	30.1	532	52.20	<i>OR = .929</i>
Total	724		299		1023	100.0	
High Mother Commu.	390	80.9	92	19.1	482	47.10	$X^2 = 45.310^{***}$
Low Mother Commu.	334	61.7	207	38.3	541	52.90	<i>OR = .381</i>
Total	724		299		1023	100.0	
High Father Commun.	343	70.7	142	29.3	485	47.41	$X^2 = .002$
Low Father Commun.	377	70.6	157	29.4	534	52.19	<i>OR = .994</i>
Total	724		299		1023	100.0	
<hr/>							
Personal/Behavioral:							
High Protection Values	400	78.0	113	22.0	513	50.14	$X^2 = 25.792^{***}$
Low Protection Values	324	63.5	186	36.5	510	49.86	<i>OR = .492</i>
Total	724		299		1023	100.0	
High Auto-Efficacy	377	77.9	107	22.1	484	47.31	$X^2 = 22.515^{***}$
Low Auto-Efficacy	347	64.4	192	35.6	539	52.69	<i>OR = .513</i>
Total	724		299		1023	100.0	
High Risk Perception	385	81.4	88	18.6	473	46.24	$X^2 = 47.998^{***}$
Low Risk Perception	339	61.6	211	38.4	550	53.76	<i>OR = .367</i>
Total	724		299		1023	100.0	
High Acad. Achievement	432	67.2	207	32.4	639	62.46	$X^2 = 8.252^{**}$
Low Acad. Achievement	292	76.0	92	24.0	384	37.54	<i>OR = 1.521</i>
Total	724		299		1023		
<hr/>							
Social:							
High Antisocial Behav.	42	22.7	143	77.3	185	18.08	$X^2 = 252.300^{***}$
Low Antisocial Behav.	682	81.4	156	18.6	838	81.92	<i>OR = 14.885</i>
Total	724		299		1023	100.0	
High Peer Pressure	294	58.9	205	41.1	499	48.77	$X^2 = 66.183^{***}$
Low Peer Pressure	430	82.1	94	17.9	524	51.23	<i>OR = 3.190</i>
Total	724		299		1023	100.0	

* $p = .066$

** $p = .003$

*** $p = .000$

As it can be seen, in table 3, among family/parental variables, high parental monitoring, high good mother-adolescent relationship and high mother-adolescent communication, are variables that related very well with drinking behavior. On the first place, high parent monitoring consistently related with lower alcohol consumption ($X^2 = 31.127$, $p < .000$). Likewise, parent monitoring proved to be a good protective factor of high alcohol use ($OR = .454$).

On the other hand, both, affective and adequate mother-adolescent relationship ($X^2 = 35.407$, $p < .000$) and mother-youth communication ($X^2 = 45.310$, $p < .000$) were also significantly associated with lower levels of alcohol consumption. Both variables complementarily demonstrated to be good protective factors ($OR = .431$ and $OR = .381$, respectively). Other family variables such as Father-Adolescent Relation and Father-Adolescent Communication did not show relevant results.

Concerning personal and behavioral variables category, including personal values, filial self-efficacy, adolescent risk perception and academic performance, all proved to be significantly related with adolescent alcohol drinking. High levels in those variables work as good protective factors, except for academic achievement.

Finally, social variables such as antisocial behavior and peer pressure are clearly related with low alcohol consumption when they exhibit low values. At higher levels, both variables are considered important risk factors for drinking behavior (see table 3).

Correlation Analysis. Tables 4, 5 and 6 show correlation matrixes for the three different analyzed category variables. Inter correlation obtained with family/parental variables (parental monitoring, mother/father relationship and mother/father communication) showed moderate to high congruence. All variables correlated negatively with alcohol consumption.

Table 4. Correlation matrix of family/parental variables

		Parental Control	Relationship with the Mother	Relationship with the Father	Communication Mother	Communication father	Alcohol Consumption
Spearman's rho	Parental Control	1.000					
	Mother relationship	.305**	1.000				
	Father relationship	.226**	.422**	1.000			
	Communication Mother	.377**	.791**	.355**	1.000		
	Communication Father	.248**	.373**	.798**	.386**	1.000	
	Consumo Alcohol	-.317**	-.230**	-.075*	-.271**	-.097**	1.000

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

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

The personal/behavioral variable group correlated also very well between them (filial self-efficacy, risk perception, academic achievement and protection values), showing moderate to high values and correlated negatively with alcohol use, except academic achievement.

Table 5. Correlation matrix of personal/behavioral variables

		Filial Self-Efficacy	Risk Perception	Academic Achievement	Protective value	Alcohol Consumption
Spearman's rho	Filial Self-Efficacy	1.000				
	Risk Perception	.311**	1.000			
	Academic Achievement	.132**	.083**	1.000		
	Protective value	.411**	.255**	.127**	1.000	
	Alcohol Consumption	-.206**	-.313**	-.147**	-.217**	1.000

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

The correlations for the social variables (peer pressure, antisocial behavior and age) presented similar result patterns; all variables interrelated very well confirming strong ties between them. It is important to note that all correlated positively with alcohol consumption (see matrix in table 6).

Table 6. Correlation matrix of social variables

		Age	Peer Pressure	Antisocial Behavior	Alcohol Consumption
Spearman's rho	Age	1.000			
	Peer Pressure	.092**	1.000		
	Antisocial Behavior	.174**	.220**	1.000	
	Alcohol Consumption	.191**	.328**	.621**	1.000

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

It is important to note that in the three previous matrixes presented, high correlation indices were not observed to suspect multicollineality.

Linear Regression Analysis. As it was clear enough that all variables incorporated in the present study proved to be relevant for the risk/protection analysis of drinking behavior (as was shown by X^2 and Odds Ratio calculation), and after verifying the strong relationship between them, further analysis was considered to be needed. Consequently, the data was tested through regression analysis, entering all the family/parental, personal/behavioral and social characteristics, expecting to identify those variables which could predict alcohol consumption in adolescents.

First at all, a model including all variables was tested (no exceptions): Age, Academic Achievement, Father-Adolescent Relationship, Mother-Adolescent Relationship, Risk

Perception, Antisocial Behavior, Parental Monitoring, Filial Self-Efficacy, Father-Adolescent Communication, Mother-Adolescent Communication, Protection Value and Peer Pressure. These variables were entered as independent or predictors, and Alcohol Consumption as dependent or criterion variable. The obtained results, as was expected, indicated that the model needed adjustment in order to be more accurate.

After excluding variables with little or no contribution or impact on the criterion variable (with lower standardized regression values), a model including the following variables was built: Age, Parental Monitoring, Father-Adolescent Relationship, Peer Pressure, Antisocial Behavior and Risk Perception. The dependent variable was once again Alcohol Consumption.

Table 7. Summary values of variance proportion explained by the model

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.686 ^a	.470	.467	6.10459	1.749

a. Predictors: (Constant), Risk Perception, Age, Peer Pressure, Father-Adolescent Relation, Antisocial Behavior, Parental Monitoring

b. Dependent Variable: Alcohol consumption

Table 7 exhibits the amount of total variance explained by the actual model. The adjusted R² was 46, 7 per cent variance of alcohol consumption with error independence (Durbin-Watson = 1.749). Even though, this variance proportion is not as high as was expected, the general model showed a significant ANOVA (F = 149.667, p< .000) (see table 8).

Table 8. General model analysis of variance with F value highly significant

ANOVA ^b						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	33465.024	6	5577.504	149.667	.000 ^a
	Residual	37713.269	1012	37.266		
	Total	71178.292	1018			

a. Predictors: (Constant), Risk Perception, Age, Peer Pressure, Father-Adolescent Relation, Antisocial Behavior, Parental Monitoring

b. Dependent Variable: Alcohol Consumption

Table 9 exhibits the beta coefficients (standardized regression coefficients), t values for each beta coefficient with their significant output and collinearity statistics. It is evident that the most influential variables in the model are the social variables (Antisocial Behavior and Peer Pressure) and risk perception. Nevertheless, the other variables also contribute well to the model.

Table 9. Standardized beta coefficients, t values and collinearity indicators related to risk/protection model

		Coefficients ^a				Collinearity Statistics	
		Unstandardized Coefficients		Standardized Coefficients		Tolerance	VIF
Model		B	Std. Error	Beta	T		
1	(Constant)	-.024	2.459		-.010	.992	
	Age	.184	.090	.049	2.037	.042	.911
	Parental Monitoring	-.094	.038	-.064	-2.441	.015	.758
	Father-Adolesc.Relation	.089	.044	.048	2.006	.045	.930
	Peer Pressure	.237	.030	.187	7.878	.000	.934
	Antisocial Behavior	.357	.017	.536	21.326	.000	.828
	Risk Perception	-.106	.020	-.134	-5.327	.000	.831

a. Dependent Variable: Alcohol Consumption

Table 9 also provides information on collinearity diagnosis confirming the functional independence of the model variables (tolerance values not below .758 and FIV values not above 1.320). It is also important to note that the graphical standardized residual analysis (ZPRED-ZRESID and P-P cumulative probability) allowed accepting the linearity, normality and homoscedasticity assumptions.

Summarizing, using the enter method, a significant risk/protection model ($F_{6,1012} = 149.667$, $p = .000$) has been obtained with a R^2 adjusted = .467 with the following significant variables:

Independent (predictor) Variables	Beta	p
Age	.049	.042
Parental Monitoring	-.064	.015
Father-Adolescent Relationship	.048	.045
Peer Pressure	.187	.000
Antisocial Behavior	.536	.000
Risk Perception	-.134	.000

Dependent (criterion) Variable: Alcohol consumption

Risk/Protection Multi-Causal Model of Alcohol Use. As a final step in the analysis, the pattern of relationship among the study variables was examined by means of structural equation modeling (Bentler, 1995, Byrne, 2010) using AMOS program. The model incorporated four of the five variables (excluding age and Risk Perception) already tested in the multiple regression procedure: parental monitoring, father-adolescent relationship, peer pressure and antisocial behavior. Peer pressure was presented as a double latent variable combining resistance and complacency to pressure. Alcohol consumption was the outcome variable in the model.

The proposed hypothesized model postulated (suggested) that adolescent alcohol consumption was determined by the following latent variables: antisocial behavior, peer pressure complacency/resistance as social variables, and parental monitoring, father-adolescent relationship as family/parental variables.

It was proposed that antisocial behavior would promote complacency to peer pressure and therefore alcohol use would be higher. On the other hand, parental monitoring would reduce antisocial behavior, decreasing the complacency with peer pressure and lowering alcohol use.

It was also assumed that parental monitoring would be able to strengthen resistance to peer pressure and therefore it can be expected to reduce alcohol consumption. In addition, the likelihood that appropriate parental monitoring could promote suitable emotional relationships between parents and adolescents would increase resistance. Consequently, an increase of the resistance to the undesirable peer pressure would reduce alcohol consumption. Finally, it was hypothesized that proper relationship between parents and adolescents could protect the latter from excessive alcohol consumption, reducing complacency to peer pressure.

The results of structured equation modeling including its estimates that are significant beyond the .05 level are presented in figure 1 and summarized in the path influence diagram in figure 2.

The model's goodness of fit to the data was corroborated by the most important fit indices considered. Although CMIN/df ($X^2 = 3.103$, $p = .000$) --on the contrary as it was expected-- resulted significant, Comparison Baseline Indicators (NFI = .895, RFI = .886, IFI = .927, TLI = .920, CFI = .926) were acceptable, and ECVI = 3.7 confirmed a parsimony-like model. Finally, the RMSEA = .045, offered also a good shape.

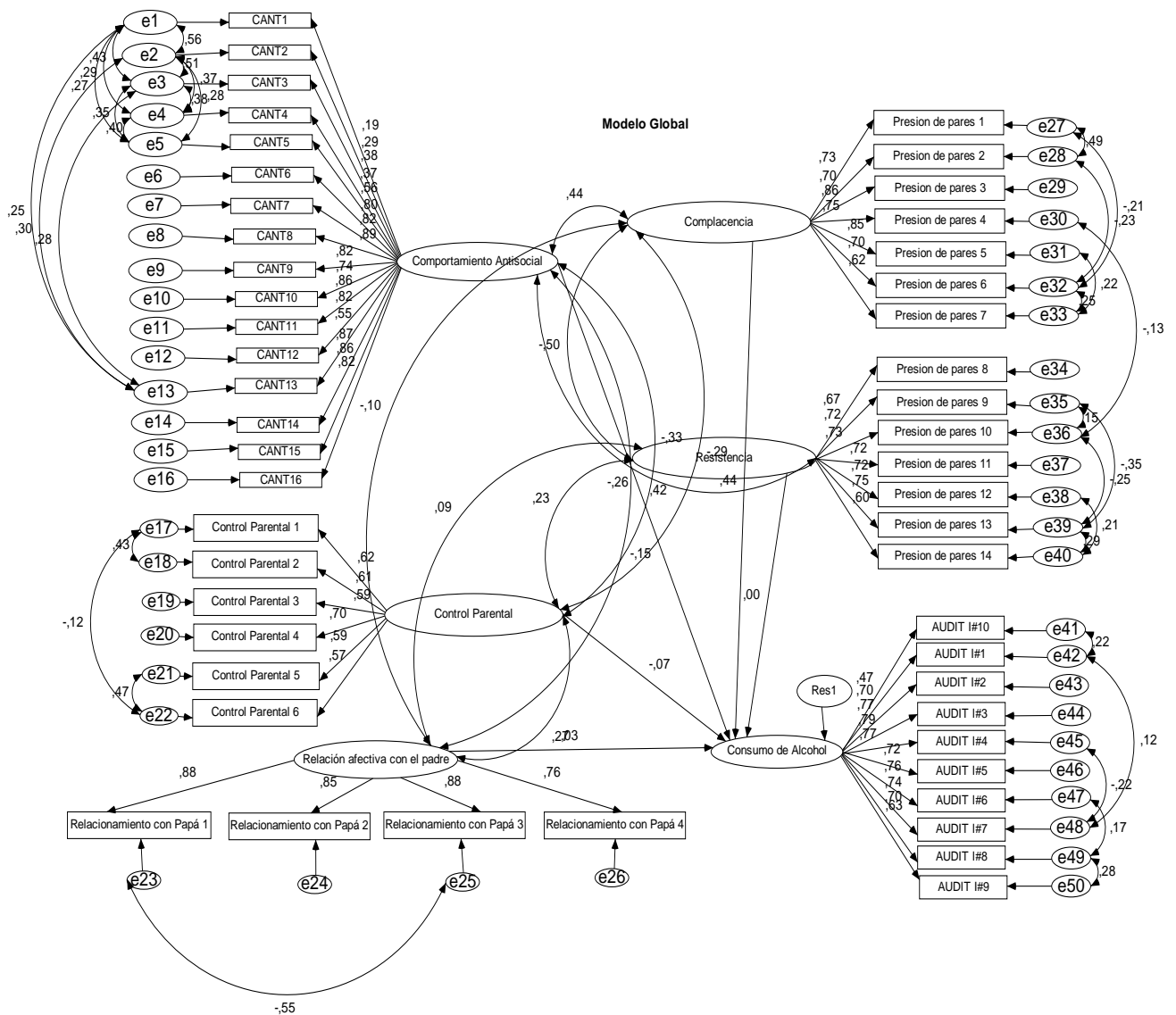


Fig. 1. Graphic description of model's general structure, including its components, parameters and standardized estimates

According to the modeling results, it is noted that, of the five latent variables hypothesized as determinants of alcohol use among adolescents (including resistance and complacency as expressions of peer pressure), three of them (antisocial behavior (.42), parent monitoring (-.07) and complacency to peer pressure (.44) demonstrated clear direct effects on drinking behavior. The remaining two (father-adolescent relationship (.032) and resistance to peer

pressure (.002), yielded no significant estimates and therefore do not explain the main endogenous variable.

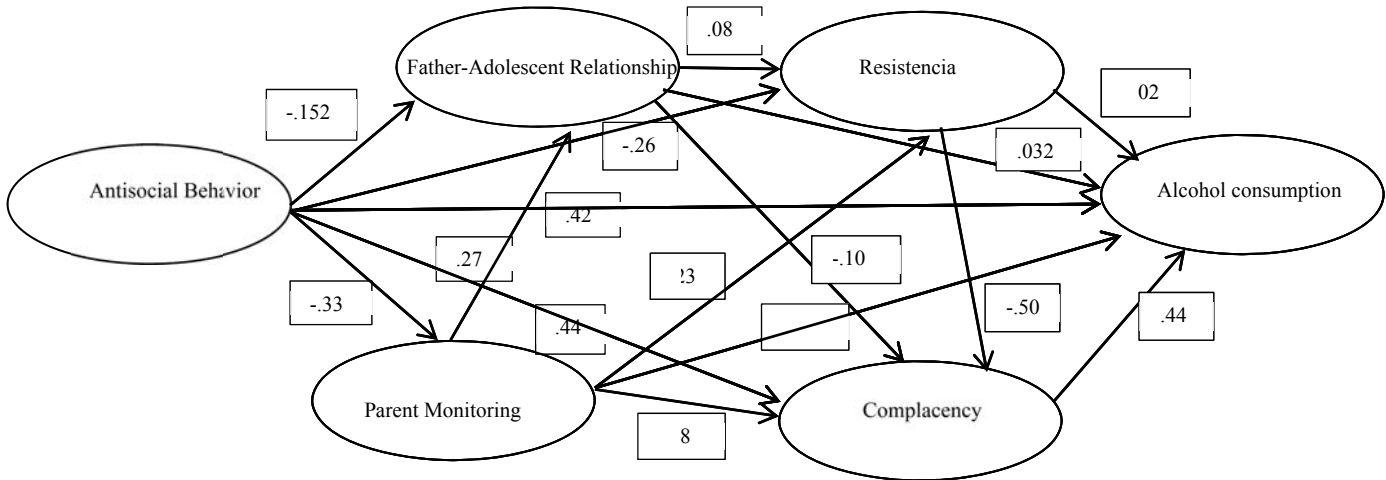


Fig.2 Path diagram summarizing the influential patterns of the model through which family/parental variables affects drinking behavior. The numbers correspond to Standardized Regression Weights ($p < .05$).

Modeling estimates also confirmed that antisocial behavior would favor complacency to peer pressure (.44) consequently alcohol consumption would increase. Likewise, parental monitoring deters teen engagement in antisocial behavior (-.33) reducing therefore the likelihood of alcohol use. Parental monitoring proved to strengthen resistance to peer pressure (.23) protecting youth binge drinking.

Parental monitoring, would also promote emotional relationships between parents and adolescents (.27), which could positively affect undesirable peer pressure resistance. However, the lack of significant relationship between this variable and alcohol consumption did not allow assuming alcohol consumption reduction when peer pressure resistance mediates between parental monitoring and excessive drinking.

The model supported the fact that a proper relationship between parents and adolescents plays as a protective factor for excessive alcohol consumption, reducing the complacency with peer pressure (.10).

Finally, the Squared Multiple Correlation index made clear that the exogenous variables: peer pressure, antisocial behavior, parental monitoring and parent-adolescent relationship; explain 56.5 percent of the alcohol consumption variance.

Therefore, a theoretical-conceptual model relatively well adjusted was obtained. Nevertheless the analysis could be further deepened, using some other elements not considered in this study. For example, it would seem appropriate to include in the model some personal variables such as filial self-efficacy beliefs or some other personal values that could operate as protective mechanisms for excessive drinking.

DISCUSSION

The results of the present research supported the line of findings reported by several authors stressing the importance of family and peer variables as risk conditions, highly related with adolescent heavy alcohol consumption. This study could fit successfully a structural equation modeling where parental monitoring, father-adolescent relationship and complacency to drinking pressure by peers, confirmed as causal variables of drinking behavior. On the other hand, antisocial conduct seems to be the most clear and relevant variable to explain alcohol consumption. Several studies also support the findings of the proposed Risk/Protection Multi-Causal Model of Alcohol Use described previously, showing a cause-effect relationship between proposed variables.

Concerning antisocial behavior and complacency to peer pressure with an increase in alcohol consumption, we agree with Brook et al. (2003), who proposed a developmental model that identified parental relationships, individual personality and behavioral characteristics, with peer relationships as critical factors in predicting adolescent drug use. In the same direction and concerning peer pressure and peer alcohol consumption, we also confirmed Pollard et al (1997) results showing that adolescent's attachment to peers plays an important role as a risk factor. Adolescents will seek emotional support and stability from their peers since they share similar attitudes and goals. In that sense, the weight of peer's pressure appears significant in complacency to alcohol and other substance use and abuse.

With regard to the effect of parent's monitoring practices in reducing antisocial behavior by decreasing complacency to peer pressure and therefore reducing alcohol use, our results are in line with those of Wright and Cullen (2001). These authors found that parental support plays

an important role in preventing adolescent's delinquent behavior. Juang and Silbereisen (1999) also reported that adolescents with supportive parents were less likely to engage in delinquent acts than those without that supportive behavior.

Other aspects of parental monitoring, such as the strengthening of peer pressure resistance for reduction of alcohol consumption, can be found at the report by Hayes et al (2004). The authors stated that "Parental permissiveness also appeared to influence peer associations, with a significant relationship between peer influence and alcohol use demonstrated when parents were permissive". Similar results were reported in the present research. Furthermore Williams and Hine (2002) in a rural area study carried out in Queensland, Australia, showed that parental permissiveness together with parental use of alcohol would predict adolescent's alcohol misuse. There is enough evidence supporting the idea that inconsistent and poor parental practices play an important role in alcohol use. Becoña (2002), states that inconsistent parental discipline together with unclear mother family implication facilitates alcohol and other substance consumption.

Concerning the increase resistance in adolescents, promoted by appropriate parental monitoring (suitable emotional relationships between parents and adolescents) and its effect in the increase of the peer pressure resistance thus lowering alcohol consumption, Hayes, Smart, Toumbourou and Sanson (2004), found that parental permissiveness in relation with alcohol use would show adolescents heavy binge drinking to be more likely.

Romero and Ruiz (2007) studying protective factors for coping with risky behaviors, found that "youth who reported spending more time with family doing positive activities were more likely to report at a later time, that their parents knew their whereabouts, who they spend time with. They also reported more consistent parental discipline and parents who often inquire about their activities" (p.51). This observation is consistent with the strong negative relationship confirmed in the present study, between parent monitoring and drinking behavior of Bolivian youth.

Results of our study contribute to previous research linking antisocial behavior with heavy alcohol drinking. For example, Catalano and Hawkins (1996) have found a consistent and systematic relationship between delinquent behavior and alcohol and drug consumption. Other authors have also stressed the importance of these three elements, through different theories: Deviated Behavior Syndrome (Hundleby and Mercer, 1987), General Deviation

Syndrome (McGee and Newcomb, 1992) and Problem behavior (Jessor, 1987). In all of them, antisocial behavior has been described accompanied by alcohol and drug consumption and in problematic sexual behavior.

Finally, data of the present study appear to be consistent with previous research stressing the importance of proper relationships between parents and adolescents protecting the latter from excessive alcohol consumption and reducing complacency to peer pressure. Adequate attachment and implication together with family positive relationships has shown to be a protective factor for alcohol and other substance use (Ryan, Jorm and Lubman, 2010; Van Der Vorst et al, 2006; Crawford and Novak, 2008). Family attachment can counter weight the influence of other risk factors like peer pressure.

Alcohol and drug prevention interventions require the development and deepen of theoretical-conceptual models like the presented. This will allow to clearly identifying population risk factors, predictors and the like for alcohol and other substance consumption (Fernández y Rojas, 2010). Such studies must be scientifically solid, and should be carried out to enlighten social policy makers in developing adequate regulation and effective preventive strategies oriented to reduce the incidence of adolescent alcohol drinking as well as the abuse of other unhealthy substances. Only through this kind of research, drug prevention interventions will have the assurance that they are cultural context sensible and evidence based, far from the bias of the social discourse and the cultural view of the phenomena.

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