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Opportunities to Use Drugs and Stages of Drug Involvement Outside the United States: Evidence from the Republic of Chile

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Abstract

Background—Studying youthful drug involvement in the Republic of Chile, we sought to replicate North American research findings about the earliest stages of drug involvement (e.g., initial opportunities to use tobacco and alcohol, and transitions leading toward illegal drug use).

Methods—A nationally representative multistage probability sample of middle and high school students was drawn; 30490 youths completed surveys that assessed age at first drug exposure opportunities and first actual drug use. Cox discrete-time survival models accommodate the complex sample design and provide transition probability estimates.

Results—An estimated 39% of the students had an opportunity to use cannabis, and 70% of these transitioned to actual cannabis use. The probability of cannabis use and the conditional probability of cannabis use (given opportunity) are greater for users of alcohol only, tobacco only, and alcohol plus tobacco, as compared to non-users of alcohol and tobacco. Male–female differences in cannabis use were traced back to male–female differences in drug exposure opportunities.

Conclusion—In Chile as in North America, when cannabis use follows alcohol and tobacco use, the mechanism may be understood in two parts: users of alcohol and tobacco are more likely to have opportunities to try cannabis, and once the opportunity occurs, they are more likely to use cannabis. Male–female differences do not seem to be operative within the mechanism that governs transition to use, once the chance to use cannabis has occurred.

Keywords

Adolescent behavior; alcohol drinking; international; marijuana smoking; psychology; tobacco smoking

1.0 INTRODUCTION

Working as from a blueprint originally specified by Professor Lee N. Robins (1977), some epidemiology research groups have turned to the concept of ‘drug exposure opportunity’ in order to throw light on suspected causal mechanisms leading through the earliest stages of drug involvement (e.g., see Van Etten et al., 1997), and through later stages as well (e.g., see Stenbacka et al., 1993; Wilcox et al., 2002; Strang & McCambridge, 2005). Wagner and Anthony (2002) made use of the ‘drug exposure opportunity’ concept in a critique of the original ‘steppingstone’ and later ‘gateway’ models of temporal sequencing from drug to drug, noting that these ‘models’ were actually just descriptions without explanatory value, and positing a mechanism that might link use of one drug to the use of a later drug in the sequence. For example, in their evidence about this mechanism, based on surveys conducted in the United States (US), young people who smoked tobacco were more likely to experience a chance to smoke cannabis (as compared to individuals without tobacco smoking experience). Moreover, once the chance to try cannabis had occurred, the tobacco smokers were more likely to engage in actual cannabis use. In their argument about these two separate mechanisms, Wagner and Anthony (2002) acknowledged a possibility that some underlying predisposition to engage in drug use, in general, might be enough to account for the observed ‘gateway’ phenomenon (as in Morral et al., 2002). Nonetheless, the predisposition would have to account for a time-sequenced excess occurrence rate for each drug exposure opportunity in the sequence, followed by a time-sequenced excess transition rate (i.e., the conditional hazard rate for actual drug use, once the exposure opportunity had occurred). Whether this same predisposition also would account for coming into contact with the drug on each occasion of drug exposure opportunity is an open question.

Unfortunately, evidence on these matters, including the tobacco-alcohol-cannabis transitions from drug exposure opportunity to actual drug use, has been drawn almost exclusively from North America, mainly the US, some from Mexico (Wagner et al., 2005; Benjet et al., 2007), and from Central America, Panama and Dominican Republic, where youthful alcohol and tobacco use are not as common as in many other parts of the world (Dormitzer et al., 2004). For contrast, consider the Republic of Chile, where an estimated 38% of secondary school students qualify as recent tobacco consumers (past month) in 2005, as compared to 9.3% for the US; corresponding estimates for recent alcohol consumption are 40% in Chile versus 18.6% in the US (World Health Organization, 2005; Johnston et al., 2007). To place in context Chile’s high tobacco prevalence, it may be useful to remember that this country accomplished accelerated and sustained economic development during the past 30 years, becoming one of the strongest economies among Latin American countries, with accelerated social and cultural changes highlighting free market values, such as individualism (International Monetary Fund, 2003; The World Bank Report, 2003).

In this study, we use data from a recent nationally representative sample of youths from Chile to examine and test the generality of prior findings about the earliest stages of drug involvement in the US (e.g., initial use of tobacco and alcohol, opportunities to use cannabis, and transitions leading toward initial drug use). We also evaluate a theoretical proposition, first advanced by Van Etten and Anthony (1999, 2001), that male-female differences in illegal drug use can be traced back to male-female differences in probability of exposure

opportunities for these drugs. That is, once the chance to try cannabis occurs, there is no male-female difference in transitioning from the cannabis exposure opportunity to actual cannabis use.

2.0 MATERIALS AND METHODS

The underlying epidemiological population included all 8th- to 12th-graders in the 62 most populous metropolitan areas of Chile that include 75% of the Chilean student population, with representation of both public and private schools, during 1999 academic year (population size N=721,989). We drew a multi-stage probability sample of 46907 students aged 12-18 years from the underlying population, with the students organized in clusters according to metropolitan areas, schools, and then classrooms. Chile's Ministry of Education, Ministry of Health and the National Commission on Drugs assessed the survey contents and procedures for Human Subjects Protection, and authorized access to the schools for the study. In addition, the University of Chile's IRB approved the study protocol. Prior to the survey date, a letter was sent to parents informing them about the survey's purpose and content. Parents were reassured that participation in the survey was voluntary and their child did not have to take part in the survey if they did not want her or him to do it. Students were also reassured that participating in the survey was voluntary and there was no penalty for refusing to participate in it. To protect confidentiality, external field assessors were trained to conduct the survey without the presence of teachers or school personnel in the classrooms. We sent a letter to the parents of each student prior to the survey to inform them of the content and procedures of the study and to allow them to decline their child's participation. Only 1% of the schools selected for the sample declined to participate, and the ratio of participants to eligible students was over 98%. A total of 30490 students provided valid data to detailed questions described below, and this is the effective sample size for our analysis. These 30490 students do not differ significantly from the total sample of 46907 with respect to pertinent covariates (e.g., sex, age, and other demographic characteristics).

Trained field assessors led the assessment session, following a standardized, self-report anonymous questionnaire protocol. We based drug-involvement measurements upon a Latin American adaptation and Spanish-language revision of the Drug Use Screening Inventory (DUSI) developed by others (Tarter and Hegedus, 1991). In particular, we assessed drug use via Spanish translation of standardized questions such as "How old were you the first time you used tobacco?" and "How old were you the first time you used cannabis?" We also added standardized questions about opportunities to use drugs, such as "How old were you when you first had a chance to try tobacco?" and "How old were you when you first had a chance to try cannabis?" Other covariates in this study included sex, age (coded into categories as follows: 12-14, 15, 16-18), type of school (private, public, and semi-private), and geographic region. Grade in school was not included in the study due to a strong collinearity with age.

After initial contingency table analyses, we re-organized the cross-sectional data in person-year records. Onset of cannabis smoking, tobacco smoking, alcohol use, and opportunity to try cannabis, were coded as time-varying characteristics ('0' until event, '1' thereafter). We

treated sex, age at assessment, and type of school as non-varying characteristics over time, as described elsewhere (Wagner and Anthony, 2002).

We grouped students into strata, or risk sets, defined by the school in which they were enrolled at the time of sampling. Conditioning on the risk set (to address student clustering within schools), we then used Cox stratified discrete-time survival regression models with covariate adjustment to estimate relative occurrence of having an opportunity to try cannabis in relation to prior use of alcohol, tobacco, or both, and then to estimate relative occurrence of actual cannabis use given a cannabis exposure opportunity, as in Wagner & Anthony (2002) from Cox (1972). We note that the overall size of the sample is one that is conducive to relatively small p-values under the null hypothesis, all else being equal. Therefore, we recommend a focus upon the relative risk (RR) estimates and the corresponding 95% confidence intervals.

3.0 RESULTS

Table 1 shows the characteristics of the youths included in the analyses of cannabis exposure opportunity (Panel “A”), as well as in the analyses of actual cannabis use among those who experienced a cannabis exposure opportunity (Panel “B”). All figures are based on unadjusted tabulations to yield proportions and odds ratio estimates. Based upon these estimates, youths who have used both alcohol and tobacco are some 20 times more likely to be exposed to a subsequent cannabis opportunity, as compared to youths who have used neither tobacco nor alcohol (estimated Odds Ratio, OR, = 19.9; 95% Confidence Interval, 95% CI = 17.9, 22.2; $p < 0.001$). Among youths who had a cannabis exposure opportunity, those who had used both alcohol and tobacco were more likely to actually try cannabis, as compared to youths who had used neither alcohol nor tobacco (OR = 14.9; 95% CI = 11.4, 19.5; $p < 0.001$).

Our Cox survival analysis regressions with covariate adjustment led to similar findings. Youths who used both alcohol and tobacco were 18 times more likely to have had a chance to try cannabis (Hazard Ratio, HR, = 18.0; 95% CI = 16.6, 19.4). We found different levels of association when we introduced covariate terms to distinguish youths who had used only one of tobacco or alcohol but not both, when compared to those who used neither tobacco or alcohol (HR = 5.0; 95% CI = 4.6, 5.5 for those who used only alcohol, and HR = 5.9; 95% CI = 5.3, 6.4 for those who used only tobacco).

Results from survival analysis regressions with covariate adjustment were also consistent with the initial estimates about the transition from opportunity to actual use. Youths who had used only alcohol but not tobacco, as compared to those who had used neither alcohol nor tobacco, had an estimated excess risk of about 6.3 (95% CI = 4.1, 9.7). For youths who had used only tobacco but not alcohol, compared to those who had used neither alcohol nor tobacco, the estimated association was 4.7 (95% CI = 3.0, 7.3), and for youths who had used both alcohol and tobacco, the estimate was 16.5 (95% CI = 11.1, 24.4).

With respect to the Van Etten-Anthony theory, males were modestly more likely to have had the chance to try cannabis than females (HR = 1.1; 95% CI = 1.1, 1.2). Once the chance to

try had occurred, there was no male-female difference in transition to actual cannabis use, despite the large sample and statistical power (HR = 1.1; 95% CI = 0.9, 1.3; $p = 0.267$).

4.0 DISCUSSION

In Chile, as in North American samples, when cannabis use follows alcohol and tobacco use, the operative mechanism may be understood in two parts: users of alcohol and tobacco are more likely to have had a chance to try cannabis, and once the chance occurs, they are more likely to start using cannabis. The strength of the observed associations was not modest, as we had hypothesized. With respect to the Van Etten-Anthony theory about male-female differences in the earliest stages of drug involvement, in Chile, males were modestly more likely to have had a chance to try cannabis as compared to females, but as hypothesized, females were just as likely to start using cannabis as their male counterparts, once the chance to try cannabis had occurred.

Before further discussion of these findings, it is important to acknowledge four limitations that can affect studies of this type. First, we note that there sometimes can be difficulties of measurement in the school survey context (e.g., see McCambridge and Strang, 2006), and that the study's measure of exposure to drug opportunities and time to events (the youth's age in years) is relatively coarse. A more fine-grained measure will be useful in future research (e.g., to differentiate very rapid transitions from alcohol or tobacco use to cannabis use, or to differentiate a cannabis exposure opportunity and the time of first use of cannabis at different times within the same year). Second, the reorganization and analysis of the data assumed that drug-related differential mortality and sample attrition do not affect the main inferences. However, in a school-aged sample, one would not expect a great many drug-related deaths due to tobacco, alcohol, or cannabis, particularly since heavy drug use in the adolescent student population of Chile is quite rare (e.g., see Caris et al., 2005). Third, these survey data do not include school dropouts, among whom alcohol, tobacco, and cannabis use might be more prevalent. As such, our omission of dropouts might actually yield downward bias in our study's basic estimates, in the direction of null associations. Finally, a fourth limitation is that the study measures of tobacco, alcohol and cannabis did not take into consideration quantity, frequency and trajectories of drug use. Recent research documents a great deal of heterogeneity in patterns and trajectories of drug involvement (e.g., some users may follow the "gateway model," while others follow different patterns of drug use, including a large majority who will stop after a few trials), as well as in the individual and contextual "predictors" of these trajectories (Schulenberg et al., 2005; Tarter et al., 2006; Tucker et al., 2006).

Despite limitations such as these, this study offers new evidence from a country in which school-aged youths smoke tobacco and drink alcoholic beverages much more often than in the US, and the research adds new useful evidence about drug exposure opportunities as part of the linked mechanisms that account for illegal drug involvement. Hence, in Chile, even where tobacco and alcohol use are quite prevalent, there is a link from the use of these drugs to the chance to try an illegal drug such as cannabis, and there is a link to the transition from that drug exposure opportunity onward to actual drug use, such that alcohol and tobacco users are more likely to have drug exposure opportunities and also to transition from the

opportunity to actual drug use. Against this background of new evidence, we must revise our theoretical proposition, and we will seek to gather new cross-national epidemiological data of a prospective character, in which we can add valid and reliable field survey measurements of personality traits such as deviance proneness and neurobehavioral disinhibition in order to estimate the degree to which personality traits such as these might be accounting for the observed linkages.

We also note the modest male excess in cannabis exposure opportunity in Chile, as well as the male-female parity in the transition from cannabis exposure opportunity to cannabis use, consistent with the Van Etten-Anthony proposition. Benjet and colleagues observed a similar modest excess occurrence of cannabis use among males, which was attributed to the fewer opportunities to use, and female were equally likely to use drugs given the opportunity (2007).

In multi-national field studies now underway, we are seeking to extend the somewhat unexpected and still unexplained evidence that female are just as likely as males to engage in cannabis use, once they are presented with a chance to try cannabis. As we work toward a more substantial conceptual model that might account for these observations, deviance proneness and neurobehavioral disinhibition also might play a role, but we note that males tend to be over-represented at the higher ends of these trait distributions. The evidence on male-female parity suggests that something else is at play, and we shall have to make the conceptual models more complex than they are at present.

Recent evidence from Mexico, a country with many parallels to Chile, suggests that the most frequent vector for exposure to an opportunity to use cannabis, cocaine, or inhalants is a friend who offers the drug as a gift (Wagner et al., 2003). This exchange has been seen as an altruistic contagion process during a “honeymoon” period of drug involvement (Van Etten et al., 1999), before negative drug effects have become evident, and before youths seek to finance their further drug involvement by ‘turning on’ others (e.g., see Voss and Clayton (1984). Wolfson and colleagues (1997) have discussed public health aspects of youthful sharing of tobacco; the evidence from Bricker and colleagues (2006) is consistent with the idea that close friends who smoke influence persistence of smoking and not just initiation of smoking. Sharing of tobacco on multiple occasions represents a possible mechanism in this context. The male-female parity observed in this study’s evidence and elsewhere might be traceable to the social demand characteristics of the occasions during which one is offered a chance to try a drug. Based on data already gathered in a number of other countries (in addition to the US), our next empirical investigation on this topic will focus upon the number of occasions of drug exposure opportunities that occur before drug-taking occurs, and whether females experience more occasions of drug exposure opportunity before they transition into actual drug use. We hope that the research stimulates colleagues in social psychology and ethnography to look more closely at the social demand characteristics of these drug-sharing occasions.

A focus upon drug exposure opportunities in a gateway process leading from one drug to the others can have a number of advantages in both public health practice and research. With respect to development of new drug epidemic prevention programs, more consideration can

be given to the idea that youthful drug users should be discouraged from sharing their drugs as gifts with friends, relatives, and more distant acquaintances. This type of discouragement might be especially important for tobacco smoking, in light of the estimated probability that as many as 40% of individuals who smoke tobacco, even once, will develop tobacco dependence (e.g., see Anthony et al., 1994; Storr et al. 2004), even if we set aside all consideration of post-tobacco consequences in the form of transitioning into other forms of drug use.

With respect to evaluating programs that seek to strengthen resistance of youths against peer pressure to use drugs, most evaluations have focused upon post-program onset of drug use, even though there can be no post-program onset of drug use unless a drug exposure opportunity has occurred. In effect, young people have been counted as resistance-strengthening program successes even when they never have had a post-program chance to try the drug or to exercise resistance strengths in response to a chance to try. Young people have been counted as resistance-strengthening program failures even if many times they have effectively resisted onset of drug use, and the program has had a beneficial effect that might be measured as a delay, or elapsed time from first opportunity to first drug use.

The drug exposure opportunity concept, to our knowledge, has not been exploited in the selection of communities for experimental evaluation of drug prevention programs with resistance-strengthening as a component part. This may be regrettable. The effects of resistance-strengthening drug prevention programs should be most salient in communities where drug exposure opportunities occur quite often. It is fortunate that drug exposure opportunities can be studied quite readily via relatively inexpensive school and community field surveys that often are mounted in advance of the selection of sites for drug prevention programs – perhaps more readily than actual drug use. Actual drug use is illegal and might not be reported with accuracy and completeness in these large-sample surveys unless special conditions prevail (e.g., see McCambridge and Strang, 2006). The recent experience of being offered a chance to try an illegal drug is not an illegal behavior or experience; it has been measured quite readily via simple standardized field survey items crafted by many different survey research groups in many different countries for many years (e.g., see Stenbacka et al., 1993; Delva et al., 1999; Dormitzer et al., 2004). As such, these measures can be added in future or ongoing research protocols with ease; the authors will make their catalog of measurements of drug exposure opportunities freely available upon request.

REFERENCES

- Anthony JC, Warner LA, Kessler RC. Comparative epidemiology of dependence on tobacco, alcohol, controlled substances, and inhalants: Basic findings from the National Comorbidity Survey. *Experimental and Clinical Psychopharmacology*. 1994; 2:244–268.
- Benjet C, Borges G, Medina-Mora ME, Blanco J, Zambrano J, Orozco R, Fleiz C, Rojas E. Drug use opportunities and the transition to drug use among adolescents from the Mexico City Metropolitan Area. *Drug Alcohol Depend*. 2007; 90:128–34. [PubMed: 17382489]
- Bricker JB, Peterson AV Jr, Andersen MR, Rajan KB, Leroux BG, Sarason IG. Childhood friends who smoke: do they influence adolescents to make smoking transitions? *Addict Behav*. 2006; 31:889–900. [PubMed: 16099595]
- Caris, L.; Cumsille, F.; Villegas, R.; Anthony, JC.; Bustos, S. Sexto Estudio Nacional de Drogas en Poblacion Escolar de Chile, 2005 de 8° básico a 4° medio. Informe Final. Consejo Nacional de

Control de Estupefacientes. Area de Evaluacion y Estudios; 2006. Available at www.epi.msu.edu/janthony/Informe_Final_05.pdf

- Cox DR. Regression models and life tables. *Journal of the Royal Statistical Society*. 1972; 34:187–220.Series B
- Delva J, Van Etten ML, Gonzalez GB, Cedeno MA, Penna M, Caris LH, Anthony JC. First opportunities to try drugs and the transition to first drug use: evidence from a national school survey in Panama. *Subst Use Misuse*. 1999; 34:1451–67. [PubMed: 10446769]
- Dornitzer CM, Gonzalez GB, Penna M, Bejarano J, Obando P, Sanchez M, Vittetoe K, Gutierrez U, Alfaro J, Meneses G, Bolivar-Diaz J, Herrera M, Hasbun J, Chisman A, Caris L, Chen CY, Anthony JC. The PACARDO research project: youthful drug involvement in Central America and the Dominican Republic. *Panam J Public Health*. 2004; 15:400–16.
- Staff Team. IMF Staff Country Reports 03/303. International Monetary Fund; 2003. Chile: 2003 Article IV Consultation--Staff Report; Staff Statement; Public Information Notice on the Executive Board Discussion; and Statement by the Executive Director for Chile.
- Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Overall, illicit drug use by American teens continues gradual decline in 2007. University of Michigan News Service; Ann Arbor, MI: 2007. [Online]. Available: www.monitoringthefuture.org [accessed 12/01/2008]
- McCambridge J, Strang J. The reliability of drug use data collected in the classroom: what is the problem, why does it matter and how should it be approached? *Drug Alcohol Rev*. 2006; 25:413–8. [PubMed: 16939935]
- Morral AR, McCaffrey DF, Paddock SM. Reassessing the marijuana gateway effect. *Addiction*. 2002; 97:1493–504. [PubMed: 12472629]
- Robins LN. Estimating addiction rates and locating target populations. How decomposition into stages helps. *NIDA Res Monogr*. 1977; 16:25–39. [PubMed: 97556]
- Schulenberg JE, Merline AC, Johnston LD, O'Malley PM, Bachman JG, Laetz VB. Trajectories of marijuana use during the transition to adulthood: the big picture based on national panel data. *J Drug Issues*. 2005; 35:255–279. [PubMed: 16534532]
- Stenbacka M, Allebeck P, Romelsjö A. Initiation into drug abuse: the pathway from being offered drugs to trying cannabis and progression to intravenous drug abuse. *Scand J Soc Med*. 1993; 21:31–9. [PubMed: 8469942]
- Storr CL, Reboussin BA, Anthony JC. Early childhood misbehavior and the estimated risk of becoming tobacco-dependent. *Am J Epidemiol*. 2004; 160:126–30. [PubMed: 15234933]
- Strang J, McCambridge J. Are cannabis users exposed to other drug use opportunities? Investigation of high-risk drug exposure opportunities among young cannabis users in London. *Drug Alcohol Rev*. 2005; 24:185–91. [PubMed: 16076588]
- Tarter RE, Hegedus AM. The Drug Use Screening Inventory: its application in the evaluation and treatment of alcohol and other drug abuse. *Alcohol Health Res World*. 1991; 15:65–75.
- Tarter RE, Vanyukov M, Kirisci L, Reynolds M, Clark DB. Predictors of marijuana use in adolescents before and after licit drug use: examination of the gateway hypothesis. *Am J Psychiatry*. 2006; 163:2134–2140. [PubMed: 17151165]
- The World Bank Group. Country in Brief; Chile: 2003. 2003
- Tucker JS, Ellickson PL, Collins RL, Klein DJ. Are drug experimenters better adjusted than abstainers and users?: a longitudinal study of adolescent marijuana use. *J Adolesc Health*. 2006; 39:488–94. [PubMed: 16982382]
- Van Etten, Gonzalez GB, Cedeno MA, Penna M, Caris LH, Anthony JC. First opportunities to try drugs and the transition to first drug use: evidence from a national school survey in Panama *Subst. Use Misuse*. 1999; 34:1451–1467.
- Van Etten ML, Neumark YD, Anthony JC. Initial opportunity to use marijuana and the transition to first use: United States, 1979-1994. *Drug Alcohol Depend*. 1997; 49:1–7. [PubMed: 9476693]
- Van Etten ML, Neumark YD, Anthony JC. Male-female differences in the earliest stages of drug involvement. *Addiction*. 1999; 94:1413–9. [PubMed: 10615725]
- Van Etten ML, Anthony JC. Male-female differences in transitions from first drug opportunity to first use: searching for subgroup variation by age, race, region, and urban status. *J Womens Health Gend Based Med*. 2001; 10:797–804. [PubMed: 11703892]

- Voss HL, Clayton RR. "Turning on" other persons to drugs. *The International Journal of the Addictions*. 1984; 19:633–52. [PubMed: 6334658]
- Wagner FA, Anthony JC. Into the world of illegal drug use: exposure opportunity and other mechanisms linking the use of alcohol, tobacco, marijuana, and cocaine. *Am J Epidemiol*. 2002; 155:918–25. [PubMed: 11994231]
- Wagner FA, González-Forteza C, Aguilera RM, Ramos-Lira L, Medina-Mora ME, Anthony JC. Exposición a oportunidades para usar drogas entre estudiantes de secundaria de la Ciudad de México. [Exposure to drug-using opportunities among middle school students in Mexico City]. *Salud Mental*. 2003; 26:22–32.
- Wagner FA, Velasco-Mondragón HE, Herrera-Vázquez M, Borges G, Lazcano-Ponce E. Early alcohol or tobacco onset and transition to other drug use among students in the state of Morelos, Mexico. *Drug Alcohol Depend*. 2005; 77:93–6. [PubMed: 15607846]
- Wilcox HC, Wagner FA, Anthony JC. Exposure opportunity as a mechanism linking youth marijuana use to hallucinogen use. *Drug Alcohol Depend*. 2002; 66:127–35. [PubMed: 11906800]
- Wolfson M, Forster JL, Claxton AJ, Murray DM. Adolescent smokers' provision of tobacco to other adolescents. *Am J Publ Health*. 1997; 87:649–51.
- World Health Organization. [last accessed 28 January 2008] WHO Global InfoBase. Secondary School Survey Data. 2005. <http://www.who.int/infobase/report.aspx?rid=115&iso=CHL&dm=8&searchButton=Search+Surveys>

Selected Characteristics of School-Attending Youths Aged 12–18 Years. Data from the Republic of Chile Survey of School-Attending Youth, 1999.

Table 1

Characteristic	Opportunity to use cannabis (n=30,490)						Cannabis use among students with an opportunity (n=11,984)					
	Yes (n=11,984)			No (n=18,506)			Yes (n=8,381)			No (n=3,603)		
	n	%		n	%		n	%		n	%	
Alcohol/tobacco use												
None	384	6.6	5420	93.4	5804	1.0	66	17.2	318	82.8	384	1.0
Alcohol only	1256	21.7	4538	78.3	5794	3.9	610	48.6	646	51.4	1256	4.6
Tobacco only	295	17.2	1425	82.9	1720	2.9	114	38.6	181	61.4	295	3.0
Alcohol and tobacco	10049	58.5	7123	41.5	17172	19.9	7591	75.5	2458	24.5	10049	14.9
Sex												
Female	5933	37.4	9913	62.6	15846	1.0	4100	69.1	1833	30.9	5933	1.0
Male	6051	41.3	8593	58.7	14644	1.2	4281	70.7	1770	29.3	6051	1.1
Age (group years)												
12–14	1949	20.9	7370	79.1	9319	1.0	1177	60.4	772	39.6	1949	1.0
15	2231	35.7	4013	64.3	6244	2.1	1475	66.1	756	33.9	2231	1.3
16–18	7804	52.3	7123	47.7	14927	4.1	5729	73.4	2075	26.6	7804	1.8
Type of school												
Public	4404	36.7	7598	63.3	12002	1.0	3192	72.5	1212	27.5	4404	1.0
Semi-private	2771	40.7	4046	59.3	6817	1.2	1821	65.7	950	34.3	2771	0.7
Private	4809	41.2	6862	58.8	11671	1.2	3368	70.0	1441	30.0	4809	0.9

* OR= Odds Ratio from contingency table analyses; 95% CI= 95% Confidence Interval.

Estimated Risk of Exposure to Cannabis Opportunity and Actual Cannabis Use by Selected Characteristics. Data from the Republic of Chile Survey of School-Attending Youth, 1999.

Table 2

Characteristic	Opportunity to use cannabis (n= 87,666 person-years)			Actual cannabis use [†] (n= 5052 person-years)		
	HR [*]	S.E. [§]	p-value	HR [*]	S.E. [§]	p-value
Alcohol/tobacco use						
None	1.0			1.0		
Alcohol only	5.0	0.209	<0.001	4.6, 5.5	1.370	<0.001
Tobacco only	5.9	0.281	<0.001	5.3, 6.4	1.060	<0.001
Alcohol and tobacco	18.0	0.692	<0.001	16.6, 19.4	3.310	<0.001
Sex						
Female	1.0			1.0		
Male	1.1	0.032	<0.001	1.1, 1.2	0.090	0.267
Age (group years)						
12–14	1.0			1.0		
15	1.1	0.047	0.122	1.0, 1.2	0.138	0.594
16–18	1.5	0.060	<0.001	1.3, 1.6	0.130	0.381

* Hazard Ratio (HR) estimate based upon Cox discrete-time survival models stratified by school.

[†] Restricted to students who had a cannabis opportunity

[§] S.E. stands for Standard Error