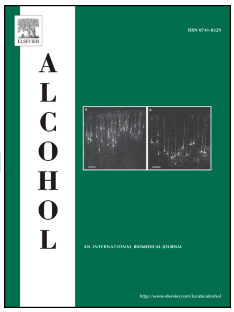

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IMPULSIVITY, MENTAL HEALTH STATE AND EMOTION REGULATION MODULATE ALCOHOL AND MARIJUANA USE IN A SAMPLE OF ARGENTINEAN CITIZENS

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Running Title: Alcohol and marijuana use in an Argentinean sample

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Abstract: Impulsivity and substance-related outcomes share a complex relationship, as various facets of impulsivity exhibit distinct associations with different drug-related outcomes. This study examines the associations between frequency and quantity of alcohol and marijuana use, with impulsivity traits, psychological distress, and the utilization of emotion regulation strategies. A survey asked Argentinian citizens (n=1507, 356 men) about frequency and quantity of alcohol or marijuana use on each day of a typical week, as well as anxiety, stress and depression symptoms (DASS-21), impulsivity-like traits (UPPS-P) and emotion regulation strategies (ERQ). The two-month prevalence of alcohol or marijuana use was 80.1%, and 27.2%, respectively. Lower premeditation was significantly (p<.05) and negatively associated with both frequency and quantity of alcohol consumed, whereas negative and positive urgency were positively and significantly (p<.05) associated with quantity of alcohol or marijuana use, respectively. Greater depression symptoms predicted greater quantity of alcohol use; whereas lower emotional suppression or lower cognitive reappraisal were significantly (p<.05) associated with a greater frequency of alcohol or marihuana use. Sensation seeking was significantly (p<.05) and positively associated with frequency of marijuana use. Individuals with higher levels of impulsivity-like traits, higher levels of depression or lower use of emotional regulation abilities appeared to be at a higher risk of alcohol or marijuana use. In this sample, the use of alcohol (though not marijuana) seems to fit a negative reinforcement pathway. The study suggests that individuals with risk factors for drug misuse could benefit from interventions aimed at enhancing emotion regulation.

Keywords: distress, impulsivity, emotion regulation, alcohol, marijuana

Introduction

The use of psychoactive substances is determined by the interplay of personal and contextual variables. Individuals exhibiting certain personality traits are more likely to engage in problematic use of drugs. For instance, high levels of sensation seeking -the tendency to seek novel, stimulating and potentially risky activities (Zuckerman & Aluja, 2015)- has been linked to higher levels of marijuana or alcohol use (Bravo et al., 2018; VanderVeen et al., 2016).

The UPPS-P model (VanderVeen et al., 2016) posits that trait impulsivity is a multidimensional, umbrella-like construct encompassing sensation seeking and four additional facets: negative and positive urgency (the inclination to act hastily under intense negative or positive emotions, respectively), lack of premeditation, and lack of perseverance (the inclination to act without considering potential negative consequences or to rapidly shift attention from one task to another, respectively). The relationship between impulsivity and substance-related outcomes is complex. The facets of impulsivity are differentially associated with different drug-related outcomes (Cyders & Smith, 2008; VanderVeen et al., 2016). For instance, it has been shown that all impulsivity facets are uniformly associated with the frequency of alcohol consumption. However, lack of perseverance and negative urgency have emerged as the most robust predictors of the quantity of alcohol consumed and the resulting consequences associated with such consumption, respectively (Coskunpinar et al., 2013).

The experience of negative affect (e.g., stress, depressive symptoms) is linked to various maladaptive outcomes, including substance use problems. The negative reinforcement model of substance use (Baker et al., 2004) proposes that individuals suffering negative affect may consume substances to lessen that discomfort (Sayette, 2017). This perspective, therefore, emphasizes coping with negative affect as a motive situated closely to the actual behavior of drug use (Corbin

et al., 2013), and may particularly fit anxiolytic or mood-altering substances, such as alcohol or marijuana. In line with this, previous research indicated a significant association between psychological discomfort and both alcohol use and the occurrence of negative alcohol-related consequences (Ruiz et al., 2020). Furthermore, research has emphasized that using alcohol as a coping mechanism for negative affect is a pathway through which personality factors, such as conscientiousness, neuroticism, and various facets of impulsivity, influence alcohol-related outcomes (Adams et al., 2012).

Some studies have reported a positive association between depressive symptoms and alcohol outcomes (Geisner et al., 2012), yet others failed to find such association (Acuff et al., 2018; Armeli et al., 2010). Understanding how individuals manage discomfort and its accompanying emotions is crucial for understanding the link between negative affect and problematic substance use (Kaiser et al., 2012). It is possible that those who report more depressive or anxiety symptoms may exhibit the same frequency of drinking or marijuana use as those who do not report such psychological discomfort, but they may exhibit differences in other variables. They might engage in more substantial alcohol consumption per occasion, exhibit riskier drinking behaviors, or turn to substances other than alcohol or marijuana as a means of managing their mood (Villarosa et al., 2018).

It is also possible that those who report more psychological discomfort exhibit deficits in emotion regulation. There has been a growing interest among addiction scientists in emotion regulation (Estévez et al., 2017; Guendelman et al., 2017), which is defined as the strategies individuals use to alter the course of their emotions. (Cabello et al., 2013). When individuals anticipate an emotion, they can modify the cognitive framing associated with that emotional event (Yeung & Wong, 2020). This reappraisal is deemed as a healthy and effective way to cope with

negative events, as it alters the course of the emotion. If the negative emotion ensues its burden can still be mitigated by suppressing its expression (Lopez et al., 2020). Emotion suppression, however, is generally regarded as an unhealthy response-focused strategy. An intriguing study, conducted in undergraduate college students who were regular drinkers, unveiled that a cognitive reappraisal-focused intervention effectively mitigated drinking-related problems (Rodriguez et al., 2019). Assessing the association between mental health status, impulsivity, and alcohol or marijuana use is vital for the development of effective interventions and the identification of individuals at risk. However, the majority of research on these subjects has primarily focused on European or North American populations. It is crucial to determine whether the findings obtained from these populations remain applicable in international contexts, particularly in developing nations like Argentina, where there is a relatively high prevalence of substance use (Mitchell & Debortoli, 2023). In that regard, Pilatti et al. (2021) found that higher levels of positive urgency and sensation seeking were linked, through social norms, to increased cannabis use frequency and more negative cannabis-related consequences. This association was consistent among college students from various countries (i.e., the United States, Argentina, Spain, Uruguay, and the Netherlands).

In Argentina, a notable 68.6% of a sample of 1st year university students have reported engaging in binge drinking within the past six months (Pilatti et al., 2017). Lifetime occurrence of binge drinking, in turn, was endorsed by approximately 20% of 14-year-old Argentinian adolescents (Mejia et al., 2019). Concurrently, there appears to be an increasing trend in cannabis use in Argentina. Bravo et al. (2019) reported 72.3% lifetime occurrence of marijuana use in a nonrepresentative sample of Argentinean college students (with 56.5% of these participants reporting last-month use). These figures nearly doubled those reported by a nationwide study

conducted in 2010 (SEDRONAR, 2010). In spite of these troubling statistics, research examining the factors associated with alcohol and marijuana use remains conspicuously limited in South America.

The present study investigated the influence of mental health status (depression, anxiety, and stress symptoms) and impulsivity-like traits (the five dimensions outlined by the UPPS-P model) on alcohol and marijuana use (both frequency and quantity) in a sample of Argentinian citizens. Additionally, the study assessed the unique role of emotion regulation strategies in these behaviors. The main aim was to discriminate, via hierarchical regression analyses, between factors that share associations with both alcohol- and marijuana-related outcomes, and factors uniquely associated with marijuana or alcohol use, after controlling for the effect of sex and age. A secondary objective was to describe the levels of depression, anxiety, and stress symptoms, as well as the levels of alcohol and marijuana use. Numerous studies indicate that alcohol and marijuana use is typically higher in men compared to women. Furthermore, sex can influence the perceived symptoms of depression, anxiety, stress, or impulsivity (as described by the five dimensions in the UPPS-P model). Therefore, the descriptive analyses took sex into account as a grouping factor.

Methods

Sample and Procedure

The selection strategy employed convenience sampling, a non-probabilistic method of sample selection. An advertisement circulated via social networks invited Argentinians aged 18 to 65 to participate in a study assessing the use of alcohol and other substances. Clicking on the provided link redirected participants to an active consent form, and upon completion, they were directed to a Lime Survey form. The voluntary nature of participation and the assurance of

response anonymity were emphasized. The protocol endorsed the Declaration of Helsinki and the National Law for the Protection of Personal Data, and was approved by the institutional review board of IIPsi-CONICET-UNC.

The participants received no compensation. We obtained 1590 responses but discarded those with less than 80% of the requested questions. The final sample comprised 1057 individuals (Mean age=32.41, SD=10.36, see Table 1 for other socio-demographic characteristics). Each analysis was conducted with the set of participants that responded to the items under analysis (i.e., missing data, if present for a given participant, were not replaced).

TABLE 1 HERE

Measures

Depression, Anxiety and Stress symptoms. We used the Spanish version (Daza et al., 2002) of the Depression Anxiety Stress Scale (DASS-21; (Lovilond, 1995). The scale features three dimensions of seven items each, assessing symptoms of depression, anxiety and stress. Participants indicated how much (from 0=*did not apply to me at all* to 3=*applied to me very much, or most of the time*) a given statement applied to their experience during the previous week. The DASS-21 featured adequate values of internal consistency, both in the original Spanish adaptation study (Daza et al., 2002) (α=.96 for the total scale, between α=.86 and α=.93 for the subscales) and in the present work (α=.93 for the total scale, between α=.81 and α=.89 for the subscales). The total scores obtained in each scale -higher scores indicate higher psychological discomfort- were used as predictors in the regression analyses. Cut-off points (Newby et al., 2020; Stanton et al., 2020) determined normal, mild, moderate, severe or extreme values of depression, anxiety and stress.

Alcohol use. Following Bravo et al. (2018), an image depicted the volume (i.e., milliliters) of different alcoholic beverages corresponding to a standard unit (SU) of alcohol (1 SU=14 g of alcohol). Participants reported the number of days (from 0 to 61) they had consumed alcohol on the last two months, and, for a typical week of those two months, the amount of SU consumed in different hourly ranges (i.e., 00 to 04; 04 to 08; 08 to 12; 12 to 16; 16 to 20; 20 to 24) of each day of a typical week (i.e., Monday to Sunday). By adding the SU reported for each day, we obtained an estimate of the total quantity consumed in a typical week.

Marijuana use. A visual aid depicted the number of grams contained in marijuana joints of different sizes and in other marijuana products (Bravo et al., 2019). Participants reported, for the last two months, the number of days they had consumed marijuana and the number of grams of marijuana consumed in different time ranges for each day of a typical week. By adding the grams consumed each day, we obtained the total amount of marijuana consumed in a typical week of the timeframe measured.

Emotion Regulation. We employed the Spanish version (Cabello et al., 2013) of the Emotion Regulation Questionnaire (ERQ) (Gross & John, 2003). Six items measure cognitive reappraisal (e.g., "When I want to feel more positive emotion, I change what I'm thinking about the situation") and four measure expressive suppression of emotions (e.g., "I keep my emotions to myself"). Participants rated each item on a 7-point scale (from 1=*strongly disagree* to 7=*strongly agree*). The ERQ features adequate values of internal consistency both in the original Spanish adaptation (α=.79 for reappraisal and α=.75 for suppression) and in the present work (α=.76 for both subscales). Within each dimension, responses were totaled. Higher scores indicate a greater use of that strategy.

Impulsivity-like traits. These were measured via the Spanish version (Lozano et al., 2018) of the Short UPPS-P Impulsive Behavior Scale (Billieux et al., 2012; Cyders et al., 2014). The scale comprises five dimensions, each consisting of four items, corresponding to the facets of impulsivity-like traits proposed by the UPPS-P model: negative and positive urgency, premeditation, perseverance, and sensation seeking. Participants rated each item on a 4-point scale (ranging from 1=*strongly agree* to 4=*strongly disagree*). Responses were summed up within each dimension. Higher scores in sensation seeking, positive urgency, and negative urgency indicate a higher level of impulsivity in those traits, while lower scores in premeditation or perseverance indicate a higher level of impulsivity. The scale features satisfactory values of internal consistency, both in the original Spanish adaptation and in the present study (with Cronbach's alpha values ranging between $\alpha = 0.70$ and $\alpha = 0.72$ for the subscales).

Data Analysis

Descriptive Statistics

To condense information, the DASS-21 responses were re-categorized into two groups (0 and 1=does not apply to me or applies only a little; 2 and 3=applies a lot or applies all the time). Cut-off points described elsewhere (Newby et al., 2020) determined the percentage of men and women falling into normal, mild, moderate, severe or extreme categories of depression, anxiety and stress. UPPS-P scores were described in the overall sample and for each sex.

Descriptive analyses (i.e., frequency, percentage or mean and SD), conducted in the overall sample and separately for each sex, described the occurrence of alcohol or marijuana use in a typical week. We calculated the percentage of participants reporting drinking alcohol or consuming marijuana at a weekly basis or in each day of the typical week of the timeframe

measured. We also calculated the amount of SUs of alcohol or grams of marijuana consumed in a weekly basis, or in each specific day of the typical week. The latter analyses were conducted in the sub-sample that, for each substance, had reported use of that substance (i.e., abstainers or marijuana non-users were excluded from these analyses).

Sex-related differences in endorsing the scores obtained in each sub-scale of the UPPS-P, or in alcohol or marijuana use (weekly occurrence or, in those reporting alcohol or marijuana use, number of drinks or grams consumed during the week) were determined via Student's *t* tests.

Regression analyses

Separate hierarchical multiple regression analyses examined the relationship between a set of independent variables and a) frequency of alcohol use, b) frequency of marijuana use, c) SU of alcohol ingested in a typical week and d) grams of marijuana used in a typical week. The frequency of alcohol or marijuana use was the number of days (from 0 to 61) indicated by the participants in the specific questions that asked on use of these drugs. The whole sample, including abstainers or marijuana non-users, was included in these analyses. We also calculated bivariate Pearson correlations between the variables used in the regressions. These coefficients are presented in the supplementary material.

The first predictors entered into the multiple regression analyses were the sociodemographic variables, biological sex, and age, along with each of the UPPS-P impulsivity-like traits. We considered these the more distal variables of the model. The scores of each sub-scale of the DASS-21 were entered in the second step, whereas the dimensions pertaining to emotional regulation entered in the third step. The rationale for this order was that the symptoms measured by the DASS-21 reflect relatively fluid changes in mental health, entailing negative

affect, which in turn require the recruitment of emotion regulation strategies. Each step included the predictors entered in that step, as well as those that had been entered in previous steps. In other words, predictors that were non-significant in one step were still carried over to the next step.

The statistical analyses were run with SPSS 17.0 (IBM Corp., Armonk, NY) and type I error was set at 0.05. Statistical notation and descriptive values for some of the inferential analyses are in the Tables. The regression coefficients presented in text and tables are standardized coefficients.

Results

Descriptive results and group differences

Depression, Anxiety and Stress

Endorsement of depression, anxiety and stress items is reported in the Supplementary Material. Almost 40% of the sample indicated that the depression items "I found it difficult to relax" or "I found it difficult to work up the initiative to do things" applied to them most of the time or always and 36.7% (39.1% of women) also endorsed to feel "felt down-hearted and blue" most of the time. Some stress-related items, such as "I found it hard to wind down" were endorsed by more than a third of the sample. Women reported more intense symptoms than men did, with this difference achieving statistically significance for several items (see Supplementary Material). Severe or extreme values of depression, anxiety and stress were exhibited by 18.1%, 16.3% and 11% of the sample (20.3%, 20.2% and 13.2% of women), respectively. Normal levels of depression were exhibited by 47.9% of the sample.

Impulsivity scores

The endorsement percentages of impulsivity-like traits and mean subscale scores in men and women are presented in the Supplementary Material. There were significant sex-related differences in the perseverance, sensation-seeking, and positive urgency subscales. Compared to women, men exhibited significantly higher scores in sensation seeking and positive urgency but showed significantly less perseverance.

Alcohol use

The occurrence of alcohol use and the amount of SUs of alcohol consumed in each day of a typical week is presented in the Supplementary Material (left and right section, respectively). Weekly prevalence of alcohol use reached 72.5% of the sample (82% in men), with prevalence during weekdays (i.e., Monday through Thursday) and during weekends ranging between 24% and 30%, and between 45% and 65%, respectively. Men exhibited significantly greater occurrence of alcohol drinking than women in all days but Monday. Among participants that reported alcohol use the mean number of SU consumed throughout the typical week was 9.12±8.13, with men exhibiting significantly greater ingestion than women in a weekly basis (11.78±9.40 vs. 7.51±6.76), and in every day but Tuesday.

Marijuana use

The occurrence and quantity (i.e., grams) of marijuana use on a typical week are presented in the Supplementary Material. Substantial sex-related differences were found, with 42.3% of men reporting weekly (any use) prevalence of marijuana use, significantly higher than the 19.4% found in women. The daily occurrence of marijuana use was fairly stable across the week in men, ranging from 21.4% (Monday) to 37.5% (Saturday), and these daily occurrences were always significantly

higher than those reported by women, which peaked at 16.1% (Saturday). The mean number of marijuana grams consumed during the typical week was, for those that had reported marijuana use, 3.36±4.49 g, with men exhibiting significantly greater weekly grams consumed than women (4.35±5.38 vs. 2.24±2.90).

Regression analyses (see Tables 2 and 3 for a full description of the regression results)

Frequency of Alcohol consumption

In the first step, sex, age and premeditation, but not the remaining dimensions of trait-like impulsivity, significantly explained (R^2 =.09) the variance of frequency of alcohol consumption [F change$_{(7,1044)}$=15.34 $p\leq$ .05]. Being male (β=.18, t=5.77, $p\leq$ .001), older (β=.22, t=7.28, $p\leq$ .001) and exhibiting lower premeditation (β=-.08, t=-2.36, $p\leq$ .05) was associated with greater frequency of alcohol consumption. The addition of depression, anxiety and stress scores in the second step did not significantly increase the explained variance. On the other hand, the entering of the dimensions of emotional regulation, in the third step, modestly but significantly increased the explained variance to 11% [F change$_{(2,1039)}$=7.82 $p\leq$ .001]. Lower emotional suppression (β=-.10, t=-3.03, $p\leq$ .05) or lower cognitive reappraisal (β=-.07, t=-2.10, $p\leq$ .05) were significantly associated with a greater frequency of alcohol use.

Quantity of Alcohol consumed during the typical week

The entering of sex, age and the impulsivity dimensions explained, in the first step, 11% of the variance [F change$_{(7,755)}$=12.62 $p\leq$ .001; R^2 =.11]. Being older (β=.08, t=2.28, $p\leq$ .05), male (β=.24, t=6.57, $p\leq$.001) and exhibiting either greater negative urgency or lower premeditation (β=.11, t=2.80, $p\leq$ .005 and β=-.10, t=-2.38, $p\leq$ .05, respectively) were associated with greater

quantity of alcohol consumed during the typical week. The change in the explained variance after entering mental health scores, in the second step, was significant [F change$_{(7,752)}$=4.20 $p\leq .001$; R^2 =.12]. Examination of the standardized coefficients revealed that greater depression scores were significantly associated with greater quantity of alcohol consumed (β=.12, t=2.30, $p\leq .05$). Levels of emotional suppression or cognitive reappraisal did not significantly contribute to the explained variance.

Frequency of marijuana consumption

Sex and sensation seeking explained 7% of the variance [F change$_{(7,1044)}$=10.84 $p\leq .001$]. Greater sensation seeking (β=.09, t=2.65, $p\leq .01$) and being male (β=.20, t=6.34, $p\leq .001$) were associated with a greater frequency of marijuana use. The entering of DASS dimensions, in the second step, did not significantly enhance the level of explained variance. The change in the explained variance after entering emotion regulation, in the third step, was significant [F change$_{(2,1039)}$=13.47, $p\leq .001$; adjusted R^2 =.09]. Lower emotional suppression scores (β=-.16, t=-5.07, $p\leq .001$) were significantly associated with greater frequency of marijuana use.

Grams of marijuana consumed during the typical week

The model explained, after entering sex, age and the impulsivity-like traits, 13% of the variance [F change$_{(7,277)}$=5.69 $p\leq .001$]. Being male (β=.18, t=3.06, $p\leq.005$) and exhibiting greater premeditation (β=.13, t=2.09, $p\leq .05$) or greater positive urgency (β=.17, t=2.46, $p\leq.05$) were associated with greater quantity of marijuana used. The entering of DASS dimensions and emotional regulation strategies did not significantly add to the percent of explained variance.

INSERT TABLES 2 and 3 HERE

Discussion

This study assessed the contribution of mental health status, impulsivity-like traits and the use of emotion regulation strategies upon alcohol or marijuana use. The goal was to distinguish between factors uniquely associated and factors that share associations with these outcomes. Lower premeditation was significantly associated with both frequency and quantity of alcohol consumed, whereas higher negative urgency significantly predicted quantity, but not frequency, of alcohol use, a result relatively congruent with those found by Cyders and Smith (2008), Cyders (2013) and Tran et al. (2018). In the latter study, lower premeditation was the only dimension that simultaneously predicted quantity of alcohol ingested and binge drinking. Moreover, in the present study mental health scores did not significantly increase the explained variance of frequency of use, but greater depression did predict greater quantity of use. Overall, these results are congruent with previous studies indicating that the different facets of impulsivity are related to specific alcohol use outcomes (Coskunpinar et al., 2013).

The fact that negative urgency, and depression scores over and beyond the latter variable, predicted quantity but not frequency of alcohol consumed suggest that how much the participants of our sample drunk followed a negative reinforcement/negative affect pathway (Baker et al., 2004). Under this hypothesis those more likely to act rashly under stress, and who are experiencing high level of depression, are more likely to drink in more quantity –but not more frequently– than participants exhibiting these characteristics to a lesser degree. In summary, we propose that the data presented, specifically that of quantity of alcohol consumed, fit a negative reinforcement pathway. Intriguingly, a study reported that, in a community sample from the US, negative urgency uniquely mediated the association between depressive symptoms and problematic alcohol use (Um et al., 2019).

If our hypothesis is true, those participants in our sample scoring higher in negative urgency and depression should also score higher in coping motives of drinking. Drinking motives, cognitive factors proximal to the actual behavior of alcohol intake (Lannoy et al., 2017), are considered to mediate the effect exerted by factors that rank first in the etiological chain leading to alcohol intake (Kuntsche et al., 2008). Regrettably, the current study did not evaluate drinking motives. Subsequent research should address this limitation

Negative affect can be modulated via emotion self-regulation. In the present study, lower emotional suppression or lower cognitive reappraisal were significantly associated with greater frequency of alcohol use, but were not associated with the quantity of this drug's consumption. It seems that, in this sample, those with greater emotion regulation were less likely to engage in a drinking episode, yet such protection disappeared as the drinking episode began. The role of emotional suppression was not unique to alcohol. Lower emotional suppression scores, in concert with other factors, promoted greater frequency of marijuana use.

Similar to what was observed for alcohol use, urgency (in this case, positive urgency) significantly predicted quantity, but not frequency, of marijuana use. It is notable that the tendency to act rashly under intense emotions significantly explained how much alcohol and marijuana drug was consumed. The difference in the valence of the urgency (i.e., positive or negative) could be attributed to different pathways associated with each drug use. Whereas negative emotions facilitate alcohol use via drinking to cope motives, extreme positive emotions may have promoted marijuana use for enhancement or expansion motives. This is, participants kept using marijuana to further exacerbate their level of positive emotion, make it last longer or enhance their perceptual experience. Alcohol and marijuana share some effects, such as tension reduction, yet the psychedelic properties of marijuana do not overlap with alcohol's effects (Simons et al., 1998).

On the other hand, sensation seeking was not associated with the alcohol drinking outcomes but significantly predicted the frequency, not quantity, of marijuana use. This pattern aligns with research indicating that sensation seeking significantly predicts the use of marijuana in adolescents (Xiao, 2008) or college students (Meil et al., 2016). Another study conducted in college students revealed that sensation seeking directly, but also indirectly via descriptive norms, affected marijuana use (Stevens et al., 2018). A limitation of the previous study, which the present report addresses, is that it measured the frequency but not the quantity of marijuana use. Additionally, the preference for novel, stimulating environments or activities predicts vulnerability to psychostimulants in clinical studies or sensitivity to their rewarding effects (Klebaur & Bardo, 1999). It has been postulated (Curry et al., 2018) that sensation seeking does not directly increase the likelihood of drug-related outcomes, but instead does so via increased positive expectations about marijuana outcomes, which in turn is associated with higher marijuana use or marijuana-induced negative consequences. Future iterations of the present study should thus measure expectations about marijuana outcomes.

A noteworthy finding was the elevated level of psychological distress identified in the present sample. Rates of severe or extreme values for depression, anxiety and stress were 18.1%, 16.3% and 11%, respectively, with less than half exhibiting normal levels of depression. Notably, close to 40% of the sample reported experiencing several depression items always or most of the time. Women exhibited, compared to men, significantly poorer mental health scores, a result consistent with research pinpointing to the vulnerability of this group. For instance, a study conducted in Uruguay (Ruiz et al., 2020) showed greater levels of psychological discomfort in women than in men. Self-identifying as a woman was also a predictor of greater anxiety or depression, or greater overall psychological distress in recent studies conducted in Turkey (Ozdin

& Bayrak Ozdin, 2020), Malaysia (Ozdin & Bayrak Ozdin, 2020) or Spain (Gutiérrez-Hernández et al., 2021).

A limitation of this study is its cross-sectional nature, which prevents from making casual assumptions, and the convenience sampling procedure. This sampling strategy relies on self-selection, which could result in over-representation of certain groups. Notably, the majority of the individuals in our sample were women. This was not surprising, as research has shown that women tend to participate more often in health-related studies than men (Glass et al., 2015). However, this imbalance might have impacted our results. Our investigation indicated significantly greater levels of stress, anxiety, and depression in women compared to men, while men, in contrast, exhibited higher levels of substance use when compared to women. Consequently, our findings might be more relevant to groups with lower substance use or higher negative affect. An innovation of the study, however, was the simultaneous measurement of frequency and quantity of marijuana used (Prince et al., 2018), as most studies only measure frequency.

It is also worth noting that the positive multivariate association between premeditation and quantity of marijuana consumed likely represents a suppression effect, because at the bivariate level the association between premeditation and marijuana use (frequency or quantity) was non-significant. Suppression, in the context of multiple regression, is a phenomenon by which the addition of a variable or set of variables alters the original relationship between an independent variable and the dependent variable. This change can involve, as in the present case, changing a non-significant relationship into a positive, significant, relationship (Friedman & Wall, 2005).

Despite the noted limitations, the study provides important information towards identifying those at greater risk for engaging in alcohol or marijuana use. Specifically, those with greater impulsivity-like traits, high levels of depression or lower emotional regulation abilities seemed to

be at greater risk of incurring in alcohol or marijuana use. The study also highlights the importance of developing interventions to help improve emotion regulation (Park et al., 2018) in those with personality risk factors for alcohol or marijuana misuse.

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Conflict of interest

All of the authors declare that they have no conflicts of interest.

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Table 1. *Sociodemographic characteristics of the sample (SD= standard deviation).*

	Total	Men	Women
N (%)	1057	356 (33.68%)	701 (66.32%)
Age			
Mean age (SD)	32.47 (10.45)	32.41(10.36)	32.48(10.51)
Highest educational level achieved			
College (ongoing)	28.38%	25.91%	29.67%
College (completed)	20.34%	19.43%	20.68%
College (begun, then dropped out)	10.5%	15.77%	7.84%
Postgraduate studies (completed)	14.76%	13.24%	15.55%
Other (i.e., includes primary or secondary education, complete or incomplete)	26.02%	25.65%	26.26%
Self-perceived socioeconomic level			
Lower middle class	20.25%	17.75%	21.54%
Middle class	52.22%	48.45%	54.07%
Upper middle class	16.37%	22.82%	13.12%
Other (i.e., includes poor, working class and high class or rich)	11.16%	10.98%	11.27%
District of residency			
Autonomous City of Buenos Aires	27.05%	29.86%	25.68%
Province of Buenos Aires	28.76%	30.70%	27.87%
Province of Córdoba	25.45%	18.30%	28.96%
Province of Santa Fe	5.96%	7.04%	5.42%
Other District	12.78%	14.10%	12.07%

Table 2. *Hierarchical multiple regression predicting frequency of alcohol use (left section) and the number of standard units of alcohol (SU, right section) consumed in each day of a typical week of the timeframe measured (i.e., last two months).*

	Frequency					SU				
Step and Variable	**β**	**t**	**Sig.**	**R^2**	**ΔR^2**	**β**	**t**	**Sig.**	**R^2**	**ΔR^2**
Step 1				**.09**	.09				**.11**	.11
Sex	.18	5.77	**.001**			.24	6.57	**.001**		
Age	.22	7.28	**.001**			.08	2.28	**.02**		
Negative Urgency	.01	.39	.69			.11	2.80	**.001**		
Perseverance	-.00	-.22	.81			.01	.26	.79		
Premeditation	-.08	-2.36	**.01**			-.10	-2.38	**.01**		
Sensation seeking	.05	1.74	.08			.03	.94	.34		
Positive Urgency	-.01	-.45	.65			.03	.87	.38		
Step 2				.09	.004				**.12**	.02
Sex	.18	5.73	**.001**			.25	6.76	.00		
Age	.22	7.23	**.001**			.10	2.96	**.001**		
Negative urgency	-.00	-.10	.92			.05	1.21	.22		
Perseverance	-.01	-.34	.72			.02	.49	.62		
Premeditation	-.08	-2.40	**.01**			-.09	-2.37	**.01**		
Sensation seeking	.06	1.86	.06			.05	1.31	.18		
Positive urgency	-.01	-.39	.69			.02	.66	.50		
Depression	-.00	-.08	.93			.12	2.30	**.02**		
Anxiety	-.05	-1.34	.18			.01	.26	.79		
Stress	.09	1.92	.05			.02	.37	.71		
Step 3				**.11**	.013				.12	.001
Sex	.18	5.76	**.001**			.25	6.47	**.001**		
Age	.21	7.14	**.001**			.10	2.95	**.001**		
Negative urgency	.00	.11	.91			.05	1.18	.23		
Perseverance	.00	-.00	.99			.02	.50	.61		
Premeditation	-.06	-1.91	.05			-.09	-2.31	**.02**		
Sensation seeking	.07	2.08	**.03**			.05	1.35	.17		
Positive urgency	-.00	-.10	.91			.02	.63	.52		
Depression	.01	.21	.82			.11	2.14	**.03**		
Anxiety	-.04	-1.05	.29			.01	.28	.77		
Stress	.07	1.59	.11			.02	.37	.70		
Expressive suppression	-.10	-3.03	**.001**			.00	.19	.84		
Cognitive reappraisal	-.07	-2.10	**.03**			-.01	-.40	.68		

Note. Significant associations ($p < .05$) are in bold typeface for emphasis.

Table 3. *Hierarchical multiple regression predicting frequency of marihuana use (left section) and the number of grams (right section) consumed in each day of a typical week of the timeframe measured (i.e. last two months).*

	Frequency					Grams				
Step and Variable	**β**	**t**	**Sig.**	**R^2**	**ΔR^2**	**β**	**t**	**Sig.**	**R^2**	**ΔR^2**
Step 1										
Sex	.20	6.34	**.00**	**.07**	.07	.18	3.06	**.001**	**.13**	.13
Age	-.04	-1.41	.15			.03	.58	.55		
Negative Urgency	-.00	-.21	.83			.12	1.80	.07		
Perseverance	-.01	-.54	.58			-.07	-1.21	.22		
Premeditation	-.01	-.32	.74			.13	2.09	**.03**		
Sensation seeking	.09	2.65	**.001**			.04	.64	.52		
Positive Urgency	.01	.29	.76			.17	2.46	**.01**		
Step 2				.07	.001				.13	.01
Sex	.20	6.34	**.001**			.17	2.84	**.001**		
Age	-.04	-1.29	.19			.03	.50	.61		
Negative urgency	-.00	-.23	.81			.15	2.07	**.03**		
Perseverance	-.01	-.46	.64			-.07	-1.18	.23		
Premeditation	-.01	-.28	.77			.14	2.28	**.02**		
Sensation seeking	.09	2.65	**.00**			.03	.57	.56		
Positive urgency	.00	.22	.82			.17	2.38	**.01**		
Depression	.01	.28	.77			.06	.73	.46		
Anxiety	.04	.93	.35			.04	.55	.57		
Stress	-.04	-.84	.39			-.16	-1.77	.07		
Step 3				**.09**	.02				.15	.01
Sex	.23	6.95	**.001**			.15	2.37	**.01**		
Age	-.04	-1.55	.12			.01	.20	.84		
Negative urgency	.00	.17	.86			.13	1.87	.06		
Perseverance	-.00	-.13	.89			-.06	-1.05	.29		
Premeditation	.00	.16	.86			.16	2.55	**.01**		
Sensation seeking	.09	2.62	**.001**			.05	.78	.43		
Positive urgency	.02	.64	.52			.17	2.50	**.01**		
Depression	.05	1.20	.22			.03	.36	.71		
Anxiety	.05	1.28	.19			.04	.51	.60		
Stress	-.06	-1.36	.17			-.15	-1.68	.09		
Expressive suppression	-.16	-5.07	**.001**			.00	.11	.91		
Cognitive reappraisal	-.01	-.40	.68			-.14	-2.36	**.01**		

Note. Significant associations ($p < .05$) are in bold typeface for emphasis.

Research Highlights

- We assessed alcohol and marijuana use and in 1507 Argentinian citizens.
- Psychological distress, impulsivity and use of emotion regulation were measured.
- Negative urgency and depression predicted quantity, but not frequency, of alcohol use.
- Sensation seeking predicted frequency, but not quantity, of marijuana use.
- Quantity of alcohol consumed seemed to fit a negative reinforcement pathway