



ELSEVIER

Contents lists available at ScienceDirect

# Addictive Behaviors Reports

journal homepage: [www.elsevier.com/locate/abrep](http://www.elsevier.com/locate/abrep)

## Development of the Substance Use Motives Measure (SUMM): A comprehensive eight-factor model for alcohol/drugs consumption

Roberta Biolcati\*, Stefano Passini

Department of Education Studies, University of Bologna, Italy



## ARTICLE INFO

## Keywords:

Substance use  
Alcohol consumption  
Motives  
Validation  
Measure

## ABSTRACT

A wide range of literature (e.g. Cooper, Kuntsche, Levitt, Barber, & Wolf, 2016) supports the assumption that substance use behaviors are driven by different needs, such as socializing with friends or escaping negative mood, that result in diverse consequences. Starting from the four factors identified by Cooper (1994), in the present research we developed the Substance Use Motives Measure (SUMM). SUMM identifies eight motives for alcohol and substance use (Enhancement, Social, Conformity, Anxiety-Coping, Depression-Coping, Boredom-Coping, Self expansion and Performance) that are assumed to be differentially related to specific patterns of substance use. The current study is a preliminary investigation of the psychometric properties of the SUMM in a nonclinical sample. The results support the internal reliability and validity of the measure and suggest that the eight motives may be linked to the use of diverse substances through different reinforcement processes. Additional results show distinct patterns of correlations between the eight motives and personality traits, as an indication of different profiles of alcohol-drug consumers. This flexible assessment measure may have important implications for research, prevention and clinical interventions.

### 1. Introduction

Following a motivational perspective, a wide range of literature (see Cooper et al., 2016, for a review) supports the assumption that substance use behaviors are driven by different needs, such as socializing with friends or escaping negative mood. These needs are characterized by qualitatively different styles of behaving and feeling, and result in diverse consequences. Motivational theorists argue that substance use motives are the final common pathway to substance use and abuse through which more distal risk variables, such as personality traits, exercise their effects (Cooper, 1994).

The motivational theory has identified four clusters of motives grouped under two main dimensions (Cooper, 1994; Cox & Klinger, 1988, 1990): (1) *self-focused motives*, such as using alcohol and other drugs to enhance pleasure or for excitement (i.e., enhancement motives) and to cope with threats to self-esteem or to escape from negative emotions (i.e., coping motives); (2) *social-focused motives*, such as using alcohol and other drugs to bond with others or improve social interactions (i.e., social motives) and to avoid social disapproval or gain other's approval (i.e., conformity motives). One of the most debated questions is whether these reasons are common or specific depending on the substance of use and abuse. Previous works (e.g., Cooper et al.,

2016) have described that alcohol, marijuana and other drugs may share certain basic motives, but the pharmacological effect and psychological experience of using these psychoactive substances differ and might lead to peculiar motives for their use. Thus, although we expect some overlaps in the basic motives for use, differences in the psychoactive properties of each substance may also lead to differences in the reasons for use. Previous studies (e.g., Lee, Neighbors, & Woods, 2007) have underlined the limits of overgeneralizing theoretical and measurement models from one substance to another without careful consideration of the unique psychoactive properties of each substance and the types of effect sought by the experience of consumption. For this reason, Comeau, Stewart, and Loba (2001) have added some scales to their measure for assessing marijuana use motives, such as to expand awareness, increase openness to new experiences, or enhance creativity. For the same purpose, Lee, Neighbors, Hendershot, and Grossbard' (2009) measure for marijuana use also includes other motives than to escape negative mood, such as to avoid or alleviate boredom and to cope with feelings of insecurity that typically arise in social situations (Lee et al., 2009). Similarly, Jones, Spradlin, Robinson, and Tragesser (2014) added to the common set of motives for opioid use (i.e., coping, social, and enhancement) a pain and relief motive, presumably stemming from the analgesic properties of opioids.

\* Corresponding author at: Department of Education Studies, University of Bologna, Via Filippo Re 6, 40126 Bologna, Italy.  
E-mail address: [r.biolcati@unibo.it](mailto:r.biolcati@unibo.it) (R. Biolcati).

<https://doi.org/10.1016/j.abrep.2019.100199>

Received 7 May 2019; Received in revised form 13 June 2019; Accepted 22 June 2019

Available online 28 June 2019

2352-8532/ © 2019 Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Based on these similarities or specificities in the reasons underlying the use of one substance as compared with another, the idea of this study is to create a scale that on the one hand takes more fully into account these various motives and, on the other, can be applied to all substances. This would make it possible to effectively compare the different reasons behind the use and abuse of each substance by way of the use of the same dimensions. In the literature, the existence of many different scales has not allowed a real comparison. Based on the original theoretical models of drinking motives (e.g. Cooper, 1994; Cooper, Frone, Russell, & Mudar, 1995; Cox & Klinger, 1988), we believe that distinguishing the motives for alcohol/drugs consumption may provide insight into the circumstances in which the individual will consume, the likely frequency of use, the possible consequences and harm, and the most suitable techniques for behavior change. In addition, with regard to substance use motives, although previous studies have strongly established that differences in affect and behavioral regulation reasons (e.g., coping, enhancement) predict patterns of alcohol consumption (e.g., Cooper, 1994; Cox & Klinger, 1990), less research has provided a comprehensive model examining alcohol/drugs use motives.

The main aim of the present study is thus to develop a comprehensive substance use motives questionnaire and conduct preliminary reliability and validity analyses. For this purpose, we decided to adapt and extend Cooper's (1994) four-factor alcohol motives measure to assess similarities and differences between motives for using alcohol and other specific drugs, namely hashish/marijuana, cocaine and opioids. An additional aim is to explore the relationship between users' motives and personality traits to determine profiles of alcohol-drug consumers.

## 2. Instrument development: Substance Use Motives Measure (SUMM)

In order to develop a common scale for all the main substances, the literature on substance use motives (e.g. Cooper, 1994; Newcomb & Bentler, 1988; McCabe & Teter, 2007; Grant et al., 2009; Grant, Stewart, & Mohr, 2009; Lee et al., 2009; Simons, Correia, Carey, & Borsari, 1998) was reviewed to perform an initial motive items development. As a starting point, we chose the Drinking Motives Questionnaire-Revised (DMQ-R; Cooper, 1994), as the source for our substance motives scale because it derives from a theory which has widespread empirical support and it specifically differentiates the four main clusters of motives (enhancement, coping, social, and conformity). The DMQ-R is a measure developed to assess all four motives implied by Cox and Klinger's (1988, 1990) motivation model of alcohol use. Although this theoretical model was initially developed to explain alcohol consumption motives, it provides a useful framework for understanding motivations for the use of different substances (see Cooper et al., 2016, for an exhaustive review). Indeed, the DMQ-R is recognized as the gold standard of measurement of alcohol motives (Kuntsche, Knibbe, Gmel, & Engels, 2005), and its suitability to assess other substances (e.g. marijuana; Simons et al., 1998) has also been confirmed. For instance, Newcomb and Bentler (1988) have shown that both alcohol and marijuana are linked to enhancement, coping and social motives.

Although the four dimensions identified by these studies are pivotal for motivational theory, in our opinion they are not the only ones that can lead to the use of a substance, especially when the focus is not just on alcohol. In this sense, the studies on the psychedelic properties of marijuana (e.g., Simons et al., 1998) led us to add specific motives that have not been previously considered with alcohol, such as expanded experiential awareness. For this reason, we added the "self-expansion motive" introduced by Simons et al. (1998), accounting for the significant association between marijuana and other psychedelics and mystical experiences. Moreover, as regards coping, the literature on substance motives (e.g., McCabe & Teter, 2007) also included particular pain related reasons for use. Specifically, Grant, Stewart, O'Connor,

Blackwell, and Conrod (2007) found that depression-coping and anxiety-coping motives were related to different patterns of alcohol use and related problems. These subordinate categories have high diagnostic value because they address highly similar but distinct factors (e.g., drinking to cope with anxious feelings, Kairouz, Glikzman, Demers, & Adlaf, 2002). For this reason, we thought it useful in our instrument to distinguish these two types of problem to be addressed (namely, anxiety-coping and depression-coping motives).

In addition, an extensive literature emphasizes boredom and its relationship with substance use during adolescence (Caldwell & Smith, 1995) or among people with mental disorders (Thornton et al., 2012). Individuals may, in fact, use substances to obtain an easy modification in arousal (Piko, Wills, & Walker, 2007). Therefore, dealing with boredom is considered a strong motivation to use substances (Biolcati, Passini, & Mancini, 2016; Lee et al., 2007). Finally, as recently underlined by research (Lee et al., 2009; Passini, 2013), especially with reference to cocaine abuse (Teter, McCabe, Cranford, Boyd, & Guthrie, 2005), a dimension referred to the presumed better physical performance derived from substance use was also added. The SUMM scale is thus composed of eight dimensions, as will be described in more detail below.

In the present research, we applied two additional measures with the aim of investigating the correlations between the SUMM and personality traits (relevant for risk profiling): specifically, the four-factor Substance Use Risk Profile Scale (SURPS) and the five-factor personality traits of the Big Five Inventory (BFI). In a study of Long et al. (2018), the four personality dimensions forming SURPS (i.e., hopelessness, anxiety sensitivity, impulsivity, and sensation seeking) were indeed differently related to the positively and/or negatively reinforcing properties of various substances and, in turn, to different types of their use. The BFI, on the other hand, measures individual differences within the five major personality traits (i.e., extraversion, openness, agreeableness, conscientiousness, and openness) and is one of the most used models on personality (Malouff, Thorsteinsson, Rooke, & Schutte, 2007; Spence, Owens, & Goodyer, 2012).

## 3. Methods

### 3.1. Participants

Participants were contacted online, using an internet questionnaire constructed using Limesurvey, a survey-generating tool (<http://www.limesurvey.org>). The validity of online sampling was tested by Gosling, Vazire, Srivastava, and John (2004), who empirically demonstrated that the results obtained by Internet investigation are coherent with those provided by traditional methods. In the present study, participants were recruited by means of a *snowballing* procedure. Respondents were advised that their participation was voluntary and that their responses would remain anonymous and confidential. No fee was offered. The questionnaire was drafted in Italian. In order to check and prevent anyone from re-entering the survey site, the subject's IP address was monitored. The data were collected in 2018.

A total of 356 Italian citizens (61.8% women) responded by accessing the website and filling out the questionnaire. Participant ages ranged from 18 to 60 years ( $M = 25.70$ ,  $SD = 9.09$ ). As regards their level of education, 6.9% declared they had finished middle school, 69% declared they had gained a high school diploma, 22.4% had a university degree and 1.7% a master's or Ph.D. qualification.

### 3.2. Measures

All measures employed five-point response scales (ranging from 1 = *not at all* to 5 = *very much*, except for use frequency). Where not specified, the original English versions were translated into Italian and submitted to a back-translation by a native English speaker. The back-translated items were then reviewed by the authors and, where

necessary, any unclear statement was reformulated.

### 3.2.1. Frequency of alcohol and substance use

Participants were asked how frequently they drank (1) beer, (2) wine, and (3) strong drinks, and how frequently they use (1) hashish/marijuana, (2) cocaine, (3) MDMA, (4) heroin, and (5) psychiatric drugs. They responded on a 6-point scale (from 1 = *never* to 6 = *every day*). For alcohol use, a mean of the three frequencies ( $\alpha = 0.74$ ) was computed.

### 3.2.2. SUMM

Participants completed the Substance Use Motives Measure (SUMM), referred both to alcohol use and the substance they use the most, apart from alcohol. That is, after all the participants had responded to the items referred to alcohol use, they were asked to indicate whether they use another psychoactive substance, and if so, they answered the same items (in a different random order) with reference to the substance specified. This procedure was chosen because we investigated a non-clinical sample. Depending on the population under study, the instructions of the questionnaire may be changed ad hoc.<sup>1</sup> The SUMM was in Italian and was composed of 32 items on eight dimensions (see Table 2 for the complete list).

### 3.2.3. SURPS

The Substance Use Risk Profile Scale (SURPS), constructed by Woicik, Stewart, Pihl, and Conrod (2009), is composed of 23 items. The scale measures four underlying personality dimensions, which, as the authors have shown, are differentially related to specific patterns of substance use. The four dimensions are: Hopelessness (7 items, e.g. "I feel that I'm a failure,"  $\alpha = 0.88$ ), Anxiety Sensitivity (5 items, e.g. "I get scared when I'm too nervous,"  $\alpha = 0.68$ ), Impulsivity (4 items,<sup>2</sup> e.g. "Generally, I am an impulsive person,"  $\alpha = 0.65$ ), and Sensation Seeking (6 items, e.g. "I would like to skydive,"  $\alpha = 0.78$ ).

### 3.2.4. BFI

Participants completed the 10-item short version of the Big Five Inventory (BFI-10, Rammstedt & John, 2007). The BFI-10 evaluates five personality dimensions, each with two items: openness, conscientiousness, neuroticism, extraversion, and agreeableness.

## 3.3. Data analysis

First, the internal reliability (both with alpha and omega coefficients) and the item-total correlations of each dimension of SUMM were examined. Internal reliability  $> 0.70$  (Cronbach & Meehl, 1955) and item-total correlations  $> 0.30$  (Green & Lewis, 1986) are considered acceptable. Second, in order to verify the structure of the SUMM, we performed a confirmatory factor analysis (CFA). Data were analyzed with Mplus 6.1 (Muthén & Muthén, 2012) using maximum likelihood estimation. Consistent with the recommendation of Hu and Bentler (1999), goodness-of-fit criteria were used in order to quantify acceptable ( $CFI > 0.90$ ,  $SRMR < 0.10$ ,  $RMSEA < 0.08$ ) fit. Finally, bivariate correlations were run to explore the relationship between substance use motives and the two personality scales (i.e., SURPS and BFI). All these analyses were performed both on the SUMM referred to alcohol use and the SUMM referred to the main primary substance.

<sup>1</sup> In investigating other substances, we suggest changing the instructions of the scale. Instead of asking for the most used substance in addition to alcohol, the instructions can refer directly to the substance being studied.

<sup>2</sup> The item "I feel I have to be manipulative to get what I want" was removed because it reduced the internal reliability.

## 4. Results

No participants declared they were abstemious and so all participants responded to the SUMM referred to alcohol. Regarding the substance they use the most, apart from alcohol, 70.3% declared "no substance," 28.1% "hashish/marijuana," and just 6 people (1.7%) declared other drugs (i.e. cocaine, MDMA, psychiatric drugs). Therefore, the SUMM investigating other substance use apart from alcohol was only referred to the one hundred people using hashish/marijuana.

As can be seen in Table 1, the SUMM had statistically acceptable values of Omega, Cronbach and inter-item correlations on all eight dimensions, both when referred to alcohol ( $n = 351$ ) and to hashish/marijuana ( $n = 100$ ). The dimension with the lowest Omega and Cronbach score was "social" (only on alcohol) and "performance," while all the others were over 0.74.

Means showed that motivations above the scale midpoint of 2.50 were Social for alcohol and Enhancement and Anxiety-Coping for hashish/marijuana. The lowest scores were Conformity and Performance for both substances. An ANOVA within the participants who responded to both SUMMs ( $n = 100$ ) showed that Social and Performance motivations were significantly greater for alcohol, while Anxiety-Coping and Self-Expansion were significantly greater for hashish/marijuana compared to the other substance.

CFA was then used to verify the fit of the eight-factors solution for the SUMM referred to alcohol use. The same analysis referred to hashish/marijuana could not be performed, as there were more parameters than the sample size (131 vs. 100). Modification indexes suggested correlating seven error terms. As some scholars (see Anderson & Gerbing, 1984; Beckstead, 2002) have pointed out, the inclusion of correlated error terms in the CFA models does not undermine the factorial validity, whereas they are theoretically plausible and do not mask a second-order model. In the current model, two correlations were all between error terms of items loading on the same dimension. Moreover, five correlations between error terms were estimated between items of distinct dimensions. These correlations were all theoretically plausible given the very similar meaning and formulation of the associated items. The first was between error terms of items referred to enjoyment: "Because it's fun" with "Because it helps you enjoy a party;" the second was between items referred to relaxing: "Because it makes me feel good" with "To relax;" the third was between items referred to self-confidence: "To be sociable" with "Because I feel more self-confident or sure of myself;" the fourth was between items referred to resourcefulness: "Because it helps me be more creative and original" with "To give me more energy;" the fifth was between items referred to self-focus: "To know my self better" with "To study or concentrate."

The final eight-dimensional model fits the data in an acceptable way:  $\chi^2(131) = 906.91$ ,  $CFI = 0.91$ ,  $RMSEA = 0.06$ ,  $SRMR = 0.06$ . Factor loadings are shown in Table 2. A one-dimensional model was tested. The same seven correlations between error terms of the eight-dimensional model were computed. The model fit was not acceptable:  $\chi^2(103) = 1871.11$ ,  $CFI = 0.72$ ,  $RMSEA = 0.09$ ,  $SRMR = 0.08$ .

Bivariate correlations between motives and frequency of use (in the case of alcohol, the mean score was used) showed that all the motives were significantly and positively correlated with use, except for Conformity and Performance (only in the case of hashish/marijuana). Correlations between SURPS and SUMM referred to alcohol (see Table 3, top left) showed that Hopelessness was positively correlated with Conformity, Anxiety-Coping, Depression-Coping, Boredom-Coping, and Self-Expansion; Anxiety Sensitivity with all the factors except Enhancement; Impulsivity with Conformity, Depression-Coping, Boredom-Coping, Self-Expansion and Performance; Sensation Seeking with all the factors except Conformity. Bivariate correlations between SURPS and SUMM referred to hashish/marijuana (see Table 3, bottom left) showed that Hopelessness was positively correlated with Depression-Coping; Anxiety Sensitivity with Conformity, Anxiety-Coping, Depression-Coping, Self-Expansion and Performance; Impulsivity with

**Table 1**  
Item analysis, and ANOVA within for the Eight SUMM dimensions.

SUMM	Alcohol <i>n</i> = 351				Hashish/Marijuana <i>n</i> = 100				ANOVA within <i>n</i> = 100		
	<i>M</i> ( <i>SD</i> )	$\omega$	$\alpha$	IIR	<i>M</i> ( <i>SD</i> )	$\omega$	$\alpha$	IIR	<i>M</i> Alcohol	<i>M</i> Hash.	<i>t</i>
Enhancement	2.33(0.95)	0.82	0.82	0.59–0.68	2.65(0.97)	0.77	0.76	0.44–0.66	2.82	2.65	1.90**
Social	2.82(0.87)	0.71	0.70	0.44–0.51	2.12(1.03)	0.80	0.80	0.43–0.72	3.12	2.12	11.19***
Conformity	1.24(0.48)	0.77	0.76	0.44–0.65	1.19(0.41)	0.77	0.74	0.39–0.74	1.34	1.19	3.50
Anxiety-Coping	1.82(0.83)	0.82	0.81	0.51–0.73	2.49(0.97)	0.80	0.78	0.30–0.79	1.95	2.49	–5.17***
Depression-Coping	1.61(0.77)	0.82	0.81	0.59–0.70	1.84(0.89)	0.79	0.78	0.50–0.67	1.77	1.84	–0.91
Boredom-Coping	1.40(0.62)	0.83	0.83	0.61–0.69	1.66(0.83)	0.88	0.88	0.72–0.75	1.65	1.66	–0.11
Self-Expansion	1.51(0.66)	0.75	0.75	0.52–0.58	2.06(1.01)	0.84	0.84	0.66–0.76	1.75	2.06	–3.69***
Performance	1.27(0.46)	0.70	0.70	0.41–0.56	1.28(0.48)	0.69	0.67	0.36–0.64	1.42	1.28	2.39*

Nota. IIR = Inter-item r. Hash. = Hashish/Marijuana. All the variables extended from 1 to 5.

\*\*\* *p* < .001.

\*\* *p* < .01.

\* *p* < .05.

**Table 2**  
Confirmatory factor analysis on the SUMM.

Item	Factor loading
Enhancement <sup>a</sup>	
1. Because it's fun	0.73
2. Because it is exciting	0.73
3. To get high	0.78
4. Because it makes me feel good	0.64
Social <sup>a</sup>	
5. To be sociable	0.72
6. As a way to celebrate	0.41
7. Because it is customary on special occasions	0.35
8. Because it helps you enjoy a part	0.79
Conformity <sup>a</sup>	
9. So I won't feel left out	0.62
10. To be liked	0.77
11. Because my friends pressure me to use	0.50
12. To fit in with a group I like	0.77
Anxiety-Coping <sup>b</sup>	
13. To relax	0.58
14. Because I feel more self-confident or sure of myself	0.63
15. Because it helps me when I am feeling nervous	0.82
16. To reduce my anxiety	0.83
Depression-Coping <sup>b</sup>	
17. To cheer me up when I'm in a bad mood	0.60
18. Because it helps me when I am feeling depressed	0.71
19. To turn off negative thoughts about myself	0.74
20. To stop me from dwelling on thinks	0.76
Boredom-Coping <sup>c</sup>	
21. Because you wanted something to do	0.76
22. To relieve boredom	0.72
23. Because you had nothing better to do	0.71
24. To spend time	0.77
Self-Expansion <sup>d</sup>	
25. To know myself better	0.59
26. Because it helps me be more creative and original	0.62
27. To understand things differently	0.69
28. To be more open to experiences	0.72
Performance <sup>c</sup>	
29. To improve my performance	0.59
30. To give me more energy	0.73
31. To study or concentrate	0.54
32. For sexual reasons	0.53

Note. Source: <sup>a</sup> = Cooper (1994). <sup>b</sup> = Grant et al. (2007). <sup>c</sup> = Lee et al. (2009). <sup>d</sup> = Simons et al. (1998).

Social, Anxiety-Coping, Depression-Coping, Self-Expansion and Performance; Sensation Seeking with Enhancement and Self-Expansion.

With regards bivariate correlations between BFI and SUMM referred to alcohol (see Table 3, top right), Extraversion was only negatively

correlated with Conformity and Anxiety-Coping, while Agreeableness was negatively correlated with all eight dimensions, as was Conscientiousness (except for Enhancement and Social). Neuroticism was positively correlated with Social, Conformity, Anxiety-Coping, and Depression-Coping. Openness was not significantly correlated with any dimension. For bivariate correlations between BFI and SUMM referred to hashish/marijuana (see Table 3, bottom right), Extraversion and Openness were not correlated with any variables. Agreeableness was negatively correlated with Boredom-Coping, as was Conscientiousness (this was also positively related to Social). Finally, Neuroticism was positively correlated with Anxiety-Coping, Depression-Coping, Self-Expansion, and Performance.

### 5. Discussion

Through the construction and validation of a new measure, the current study aimed to capture a comprehensive picture of substance use motives, accounting for consumers who use and abuse alcohol/drugs for specific and different reasons. First of all, the results confirm the adequacy of the measure from a statistical point of view, both when the items were referred to alcohol and to the use of hashish/marijuana. Indeed, the psychometric properties (i.e., Omega, Cronbach and inter-item correlations) are acceptable for all the dimensions. Therefore, notwithstanding the fact that each dimension is composed of just a few items (in order to obtain a shorter and more usable scale, despite its complexity), the dimensions have a good internal consistency. The structure of the tool is confirmed by the CFA, even if in this case the analysis was only computed on the SUMM referred to alcohol.

Secondly, the use of a single measure that covers multiple substances has allowed us to compare the motives for using them, thus fulfilling one of the purposes of the scale. In the present research, this comparison was made only between alcohol and hashish/marijuana, as all the other substances were not frequently used. Such comparison shows that while enhancement drives the use of both substances, the motives for alcohol consumption are more related to improving sociality (a social-focused motive) and in a lesser way to self-focused motives. Instead, motives for the use of hashish/marijuana are also linked to coping with anxieties, as well as a way to expand the self. In accordance with previous studies (Comeau et al., 2001; Newcomb & Bentler, 1988), some reasons for using marijuana overlap with motives for using alcohol (specifically the enhancement motive). Nevertheless, our results are in line with Simons et al. (1998) who showed that social motives are central factors underlying alcohol use, but are not significant predictors of marijuana use (see also Kairouz et al., 2002). This pattern may depend on the differences between a legal and socially accepted substance such as alcohol, and an illicit and less socially accepted drug such as hashish/marijuana. Moreover, it may be linked to the perceived social openness offered by alcohol (see Smit, Groefsema,

**Table 3**  
Pearson correlation coefficients among all the variables.

SUMM	Frequency use	SURPS				BFI				
		H	AS	IMP	SS	E	A	C	N	O
<i>Alcohol</i>										
Enhancement	0.38***	0.10	0.11	0.09	0.26***	0.04	-0.16**	-0.11	0.04	0.02
Social	0.30***	0.06	0.20***	0.09	0.20***	-0.09	-0.13*	-0.10	0.13*	-0.04
Conformity	0.06	0.23***	0.33***	0.14**	0.08	-0.14**	-0.22***	-0.18**	0.20*	-0.07
Anxiety-Coping	0.27***	0.23***	0.25***	0.07	0.15**	-0.13*	-0.13*	-0.14**	0.11*	-0.02
Depression-Coping	0.23***	0.21***	0.28***	0.13*	0.15**	-0.09	-0.12*	-0.14**	0.13*	-0.05
Boredom-Coping	0.20***	0.19***	0.13*	0.16**	0.20***	-0.04	-0.27***	-0.21***	0.09	0.03
Self-Expansion	0.22***	0.22***	0.21***	0.18***	0.22***	-0.08	-0.13*	-0.12*	0.08	-0.05
Performance	0.24***	0.10	0.17**	0.22***	0.22***	0.01	-0.13*	-0.13*	0.11	-0.08
<i>Hashish/Marijuana</i>										
Enhancement	0.20*	-0.01	-0.07	0.11	0.20*	0.00	-0.11	0.09	0.06	0.06
Social	0.26**	-0.08	0.14	0.21*	0.13	-0.06	-0.06	0.22*	0.18	-0.07
Conformity	-0.12	0.11	0.40***	0.08	0.00	-0.12	-0.14	-0.15	0.17	-0.03
Anxiety-Coping	0.43***	0.10	0.23*	0.30**	0.14	-0.02	0.02	0.05	0.23*	0.09
Depression-Coping	0.23*	0.22*	0.26*	0.26*	0.03	-0.04	-0.12	-0.06	0.23*	0.00
Boredom-Coping	0.24*	0.13	0.17	0.04	0.00	-0.20	-0.34***	-0.28**	0.14	0.10
Self-Expansion	0.22*	0.10	0.28**	0.32**	0.38***	-0.14	-0.16	-0.05	0.31**	0.11
Performance	0.13	0.13	0.22*	0.33***	0.10	-0.10	-0.02	-0.19	0.23*	-0.07

Note. H = Hopelessness. AS = Anxiety Sensitivity. IMP = Impulsivity. SS. = Sensation Seeking. E = Extraversion. A = Agreeableness. C = Conscientiousness. N = Neuroticism. O = Openness.

\*\*\*  $p < .001$ .

\*\*  $p < .01$ .

\*  $p < .05$ .

Luijten, Engels, & Kuntsche, 2015). Furthermore, our results are in line with a previous study on college students (Read, Wood, Kahler, Maddock, & Palfai, 2003) showing that coping motives (unlike social motives, which are predominant predictors) are not significantly associated with alcohol use. Instead, coping motives are a significant predictor of marijuana use (Simons, Gaher, Correia, Hansen, & Christopher, 2005). Indeed, scholars (e.g. Bortorff, Johnson, Moffat, & Mulvogue, 2009) have previously found that adolescents do not use marijuana for recreational purposes, but rather to alleviate anxiety and stress. Moreover, our study supported the findings of Simons et al. (1998) that the “expansion motive” represents a core motivational drive to marijuana use.

Thirdly, distinctions between the two substances also emerged with respect to the relationships with the personality dimensions, namely those investigated by SURPS and BFI. These correlations between motives and personality traits suggest some reinforcement-specific interactions. With regards SURPS, similarly to what was found by the authors of the scale (Woicik et al., 2009), coping motives for alcohol use are significantly related to Hopelessness (H) and Anxiety Sensitivity (AS). Specifically, our results show that coping motives are correlated with all the SURPS dimensions (except for the correlation between anxiety-coping and impulsivity), even if the strongest values are with H and AS. Several studies highlighted that drinking to cope with negative emotions is associated with feelings of helplessness and social isolation (Bradley, Carman, & Petree, 1991) and with high levels of anxiety sensitivity (Comeau et al., 2001). Indeed, hopeless individuals use alcohol to cope with their sense of being rejected in social relationships and anxiety-sensitive individuals consume alcohol due to its anxiolytic properties (Kuntsche, Knibbe, Gmel, & Engels, 2006). Therefore, as alcohol is generally considered to be a depressant, rather than an antidepressant (Woicik et al., 2009), escaping from negative moods (i.e. anxiety and depression) seems to represent a worthy motive for using alcohol for those individuals with hopelessness, anxiety sensitivity and sensation seeking traits. Moreover, Boredom-Coping is strongly related to Hopelessness, Impulsivity (even if the correlation is less strong) and Sensation Seeking (SS). Regarding H, we could think that some items such as “have nothing better to do” could refer to the “absence of hope.” For the other two personality traits, the close connections between

boredom proneness, sensation seeking and drinking motives are well documented in the literature (e.g. Biolcati et al., 2016; Biolcati, Mancini, & Trombini, 2018).

The results also highlight that SS is a personality trait strongly related to several social and self-focused motives for drinking. Indeed, SS correlates with all drinking motives except for conformity and this can be explained by the fact that individuals who engage in behaviors to seek strong sensations are not so interested in adhering to the group (Comeau et al., 2001). Moreover, differently from Woicik et al. (2009) study where it was not related to any motives, in our research Impulsivity strongly correlated with Self-expansion and Performance. This may be explained by the fact that impulsive individuals are likely to favor these motives in an attempt to experience greater thrill and stimulation (Gullo, Dawe, Kambouropoulos, Staiger, & Jackson, 2010). This result suggests that the personality traits investigated by SURPS may interact with additional different motives than those indicated by the Cooper (1994) model, later extended by Grant et al. (2007).

With regards marijuana users, we found a strong relationship between AS and conformity; a similar result has already been found in the adolescent population (see Woicik et al., 2009), and suggests that individuals who are sensitive to anxiety – which often takes the form of social anxiety – may smoke because they are driven by the fear of being excluded from the group. A novel yet consistent result shows that impulsive individuals declare using marijuana for performance, self-expansion, anxiety-coping and depression-coping motives. We can presume that for individuals who have characteristics of impulsiveness, the substance may have calming and illusory self-improving effects. In sum, anxious individuals seem to use marijuana for conformism and depression and to improve their performance; impulsive people use it to calm down and to improve their performance. When the sensation seekers do so, they are driven by a more evident motivation: i.e. to overcome the limits of the Self. Finally, Self-Expansion is the motivation significantly related to the largest number of personality traits. This result confirms that such motive is closely connected to the pharmacokinetic properties of the substance (Simons et al., 1998).

Insofar as the Big Five Inventory is concerned and in agreement with previous results (see Malouff et al., 2007), Agreeableness (A) and Conscientiousness (C) are negatively related to the use motives for both

substances, which suggests that they can serve as protective personality factors. We are not surprised that neuroticism correlated with several drinking motives including coping. There is strong evidence (e.g. Cooper, Agocha, & Sheldon, 2000) that drinking to cope with negative emotions is associated with neuroticism, defined as emotional lability, hypersensitivity to criticism, and a tendency to live negatively. Instead, being open to experiences (Openness) shows no correlation with motivations for the use of psychoactive substances, as confirmed by the literature (Kotov, Gamez, Schmidt, & Watson, 2010).

As regards marijuana users, low C and A correlate with boredom coping motives and high neuroticism trait correlates more strongly with Self-Expansion. These results confirm those studies that have found that low conscientiousness, high neuroticism, and low agreeableness are related to several substance use motives (e.g. Kuntsche et al., 2006). Even though they were not the primary focus of the study, these within-group differences in associations between personality traits and alcohol and marijuana motives are intriguing and warrant further investigation in future large investigations, including other substances.

This research has some limitations that should be borne in mind for future research. First of all, the results should be confirmed in a larger sample, in different social contexts, and with different populations. In particular, the latter could overcome the limitation of the present research of involving people with a medium-high level of education and of having few frequencies in using substances other than alcohol. The study of target populations and samples with specific patterns of use (e.g. clubbers, ravers and clinical samples) would lead to a greater validity of the scale also for the other substances. As this aspect is one of the strengths of the SUMM, future studies should collect more results on distinct substances in order to support the robustness of the scale. In this way, it might be possible to confirm the usefulness of SUMM in investigating motives related to other substances, other than alcohol and hashish/marijuana. Finally, it may also be interesting to study the relationship of the SUMM with other relevant concepts, for instance narcissism (Biolcati & Passini, 2018) and self-esteem (Lewis, Phillippi, & Neighbors, 2007).

Notwithstanding these limitations, and although the strength of the scale should be assessed through multiple applications, the results presented in this article are promising. Specifically, we believe that the SUMM could be very useful both for research and in practical interventions, given its briefness and at the same time its complexity. Moreover, the development of a single scale for the analysis of different substances should help to synthesize a literature full of interesting results, which are often difficult to compare. In this sense, the SUMM may be a powerful tool to advance research into the understanding of the motives behind substance use and abuse. The study of similarities and differences in use has important implications for prevention strategies. Similarities suggest domains that can be targeted in universal intervention strategies, whereas differences indicate areas that should be addressed by substance specific programming.

#### Role of funding sources

There were no funding sources for this research.

#### Declaration of Competing Interest

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

#### References

Anderson, J. C., & Gerbing, D. W. (1984). The effect of sampling error on convergence, improper solutions, and goodness-of-fit indices for maximum likelihood confirmatory factor analysis. *Psychometrika*, *49*(2), 155–173.

Beckstead, J. W. (2002). Confirmatory factor analysis of the Maslach Burnout Inventory among Florida nurses. *International Journal of Nursing Studies*, *39*(8), 785–792.

Biolcati, R., Mancini, G., & Trombini, E. (2018). Prone to boredom and risk behaviors

during adolescents' free time. *Psychological Reports*, *121*(2), 303–323.

Biolcati, R., & Passini, S. (2018). Narcissism and self-esteem: Different motivations for selfie posting behaviors. *Cogent Psychology*, *5*(1), 1–12.

Biolcati, R., Passini, S., & Mancini, G. (2016). "I cannot stand the boredom." Binge drinking expectancies in adolescence. *Addictive Behaviors Reports*, *3*, 70–76.

Bottoff, J. L., Johnson, J. L., Moffat, B. M., & Mulvogue, T. (2009). Relief-oriented use of marijuana by teens. *Substance Abuse, Treatment, Prevention, and Policy*, *4*(7), 1–11.

Bradley, J. R., Carman, R. S., & Petree, A. (1991). Expectations, alienation, and drinking motives among college men and women. *Journal of Drug Education*, *21*(1), 27–33.

Caldwell, L. L., & Smith, E. A. (1995). Health behaviors of leisure alienated youth. *Loisir et Société/Society and Leisure*, *18*(1), 143–156.

Comeau, N., Stewart, S. H., & Loba, P. (2001). The relations of trait anxiety, anxiety sensitivity, and sensation seeking to adolescents' motivations for alcohol, cigarette, and marijuana use. *Addictive Behaviors*, *26*(6), 803–825.

Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological Assessment*, *6*(2), 117–128.

Cooper, M. L., Agocha, V. B., & Sheldon, M. S. (2000). A motivational perspective on risky behaviors: The role of personality and affect regulatory processes. *Journal of Personality*, *68*(6), 1059–1088.

Cooper, M. L., Frone, M. R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and negative emotions: A motivational model of alcohol use. *Journal of Personality and Social Psychology*, *69*(5), 990–1005.

Cooper, M. L., Kuntsche, E., Levitt, A., Barber, L. L., & Wolf, S. (2016). Motivational models of substance use: A review of theory and research on motives for using alcohol, marijuana, and tobacco. *The Oxford handbook of substance use and substance use disorders*, *1*, 375–421.

Cox, W. M., & Klinger, E. (1988). A motivational model of alcohol use. *Journal of Abnormal Psychology*, *97*(2), 168–180.

Cox, W. M., & Klinger, E. (1990). Incentive motivation, affective change, and alcohol use: A model. In M. Cox (Ed.), *Why people drink: Parameters of alcohol as a reinforcer* (pp. 291–314). New York: Gardner Press.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, *52*(4), 281–302.

Gosling, S. D., Vazire, S., Srivastava, S., & John, O. P. (2004). Should we trust web-based studies? A comparative analysis of six preconceptions about internet questionnaires. *American Psychologist*, *59*(2), 93–104.

Grant, B. F., Goldstein, R. B., Chou, S. P., Huang, B., Stinson, F. S., Dawson, D. A., & Ruan, W. J. (2009). Sociodemographic and psychopathologic predictors of first incidence of DSM-IV substance use, mood and anxiety disorders: Results from the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. *Molecular Psychiatry*, *14*(11), 1051–1066.

Grant, V. V., Stewart, S. H., & Mohr, C. D. (2009). Coping-anxiety and coping-depression motives predict different daily mood-drinking relationships. *Psychology of Addictive Behaviors*, *23*(2), 226–237.

Grant, V. V., Stewart, S. H., O'Connor, R. M., Blackwell, E., & Conrod, P. J. (2007). Psychometric evaluation of the five-factor Modified Drinking Motives Questionnaire-Revised in undergraduates. *Addictive Behaviors*, *32*(11), 2611–2632.

Green, L. W., & Lewis, F. M. (1986). *Measurement and evaluation in health education and health promotion*. Palo Alto, CA: Mayfield Publishing Company.

Gullo, M. J., Dawe, S., Kambouropoulos, N., Staiger, P. K., & Jackson, C. J. (2010). Alcohol expectancies and drinking refusal self-efficacy mediate the association of impulsivity with alcohol misuse. *Alcoholism: Clinical and Experimental Research*, *34*(8), 1386–1399.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55.

Jones, R. E., Spradlin, A., Robinson, R. J., & Tragesser, S. L. (2014). Development and validation of the Opioid Prescription Medication Motives Questionnaire: A four-factor model of reasons for use. *Psychology of Addictive Behaviors*, *28*(4), 1290–1296.

Kairouz, S., Gliksmann, L., Demers, A., & Adlaf, E. M. (2002). For all these reasons, I do... drink: A multilevel analysis of contextual reasons for drinking among Canadian undergraduates. *Journal of Studies on Alcohol*, *63*(5), 600–608.

Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking "big" personality traits to anxiety, depressive, and substance use disorders: A meta-analysis. *Psychological Bulletin*, *136*(5), 768–821.

Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. (2005). Why do young people drink? A review of drinking motives. *Clinical Psychology Review*, *25*, 841–861.

Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. (2006). Who drinks and why? A review of socio-demographic, personality, and contextual issues behind the drinking motives in young people. *Addictive Behaviors*, *31*(10), 1844–1857.

Lee, C. M., Neighbors, C., Hendershot, C. S., & Grossbard, J. R. (2009). Development and preliminary validation of a comprehensive marijuana motives questionnaire. *Journal of Studies on Alcohol and Drugs*, *70*(2), 279–287.

Lee, C. M., Neighbors, C., & Woods, B. A. (2007). Marijuana motives: Young adults' reasons for using marijuana. *Addictive Behaviors*, *32*(7), 1384–1394.

Lewis, M. A., Phillippi, J., & Neighbors, C. (2007). Morally based self-esteem, drinking motives, and alcohol use among college students. *Psychology of Addictive Behaviors*, *21*(3), 398–403.

Long, E. C., Milcheva, S., Pseuderska, E., Vasilev, G., Bozgunov, K., Nedelchev, D., ... Vassileva, J. (2018). Validation of the Substance Use Risk Profile Scale (SURPS) with Bulgarian substance dependent individuals. *Frontiers in Psychology*, *9*, 11–26.

Malouff, J. M., Thorsteinson, E. B., Rooke, S. E., & Schutte, N. S. (2007). Alcohol involvement and the five-factor model of personality: A meta-analysis. *Journal of Drug Education*, *37*, 277–294.

McCabe, S. E., & Teter, C. J. (2007). Drug use related problems among nonmedical users of prescription stimulants: A web-based survey of college students from a Midwestern

- university. *Drug and Alcohol Dependence*, 91(1), 69–76.
- Muthén, L. K., & Muthén, B. O. (2012). *MPlus: Statistical analysis with latent variables—user's guide*. Los Angeles, CA: Muthén & Muthén.
- Newcomb, M. D., & Bentler, P. M. (1988). Impact of adolescent drug use and social support on problems of young adults: A longitudinal study. *Journal of Abnormal Psychology*, 97(1), 64–75.
- Passini, S. (2013). A binge-consuming culture: The effect of consumerism on social interactions in western societies. *Culture & Psychology*, 19(3), 369–390.
- Piko, B. F., Wills, T. A., & Walker, C. (2007). Motives for smoking and drinking: Country and gender differences in samples of Hungarian and US high school students. *Addictive Behaviors*, 32(10), 2087–2098.
- Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*, 41(1), 203–212.
- Read, J. P., Wood, M. D., Kahler, C. W., Maddock, J. E., & Palfai, T. P. (2003). Examining the role of drinking motives in college student alcohol use and problems. *Psychology of Addictive Behaviors*, 17(1), 13–23.
- Simons, J. S., Correia, C. J., Carey, K. B., & Borsari, B. E. (1998). Validating a five-factor marijuana motives measure: Relations with use, problems, and alcohol motives. *Journal of Counseling Psychology*, 45(3), 265–273.
- Simons, J. S., Gaher, R. M., Correia, C. J., Hansen, C. L., & Christopher, M. S. (2005). An affective-motivational model of marijuana and alcohol problems among college students. *Psychology of Addictive Behaviors*, 19(3), 326–334.
- Smit, K., Groefsema, M., Luijten, M., Engels, R., & Kuntsche, E. (2015). Drinking motives moderate the effect of the social environment on alcohol use: An event-level study among young adults. *Journal of Studies on Alcohol and Drugs*, 76(6), 971–980.
- Spence, R., Owens, M., & Goodyer, I. (2012). Item response theory and validity of the NEO-FFI in adolescents. *Personality and Individual Differences*, 53(6), 801–807.
- Teter, C. J., McCabe, S. E., Cranford, J. A., Boyd, C. J., & Guthrie, S. K. (2005). Prevalence and motives for illicit use of prescription stimulants in an undergraduate student sample. *Journal of American College Health*, 53(6), 253–262.
- Thornton, L. K., Baker, A. L., Lewin, T. J., Kay-Lambkin, F. J., Kavanagh, D., Richmond, R., & Johnson, M. P. (2012). Reasons for substance use among people with mental disorders. *Addictive Behaviors*, 37(4), 427–434.
- Woicik, P. A., Stewart, S. H., Pihl, R. O., & Conrod, P. J. (2009). The substance use risk profile scale: A scale measuring traits linked to reinforcement-specific substance use profiles. *Addictive Behaviors*, 34(12), 1042–1055.