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Reliability and Validity of the Modified Drinking Motives Questionnaire Revised (MDMQ-R) and the Marijuana Motives Measure (MMM) in a sample of South African university students

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Abstract

Alcohol and marijuana are the most frequently and heavily consumed substances in South Africa, both in the general population and among university students. Understanding the motivations that lead to substance use can help inform prevention and intervention programmes. To date, many studies have examined the alcohol and marijuana use motivations of university students, however, these have largely been based in North America with little research emerging from low- and middle-income contexts such as South Africa. Identifying valid and reliable instruments to assess substance use motives in the South African context is an important first step in understanding and intervening in the underlying motives that drive substance use. The current study examined the psychometric properties of the Modified Drinking Motives Questionnaire – Revised (MDMQ-R) and the Marijuana Motives Measure (MMM) in a sample of students from the University of Cape Town (N = 345). Participants completed the motivation scales and the Rutgers Alcohol Problem Index (RAPI) and the Brief Marijuana Consequences Questionnaire (BMCQ) to assess the severity of alcohol and marijuana related problems. A confirmatory factor analysis did not support the original 5-factor structure of the MDMQ-R, but rather a 3-factor structure with a conformity factor, coping factor, and a combined social and enhancement factor. A 4-factor structure was most suitable for the MMM data, with conformity, coping, expansion factors as well as a combined social and enhancement factor. A multiple regression analysis indicated that only coping motives were predictive of harmful alcohol use and that both coping and expansion motives predicted harmful marijuana use. In light of the high rates of alcohol and marijuana use in the general South African population, further validation of the MDMQ-R and the MMM with non-university samples in South Africa is recommended, as well as research examining the contribution of different motivations to harmful substance use in the general population.

Harmful alcohol use is a global concern and is responsible for approximately 3 million deaths each year, or about 5.3% of all deaths (World Health Organization [WHO], 2018). Furthermore, alcohol contributes to more than 200 forms of diseases and injuries and contributes to over 5.1% of the global disease burden. The global alcohol consumption rate is 6.4 litres per person each year, aged 15 and older (WHO, 2018). Moreover, less than half of the world's population (38.8%) consume alcohol which means that of those who do drink, the consumption rate is 17 litres per person annually (WHO, 2018). In addition to alcohol, marijuana is a highly popular substance of choice with a global consumption rate of 2.5%, thus making it the not only the most widely consumed, but also the most cultivated and abused illicit drug in the world (WHO, 2016). Since the 1960's, the use of marijuana has increased substantially, particularly in younger age groups, and has a younger age of onset than any other drug (WHO, 2016).

The consumption of both alcohol and marijuana are of particular concern among university students. University presents students with newfound independence and freedom, and often, it is at university that people first experience alcohol and marijuana (Karam et al., 2007; Skidmore et al., 2016).University students worldwide are reported to consume more alcohol and have a higher prevalence of alcohol use disorders than their non-university counterparts (Karam et al., 2007). In the United States, prevalence rates for alcohol use amongst university students are as high as 76% and binge drinking has been identified as the leading cause of death for American students (Karam et al., 2007; Skidmore et al., 2016). Similar trends have also been reported in the United Kingdom and Ireland where 60-70% of university students engaging in hazardous drinking and over 20% exceed safe limits of alcohol consumption each week (Davoren et al., 2016). Heavy alcohol consumption in university populations is not confined to the United States as more emerging research shows increasing levels of both alcohol consumption and the proportion of heavy drinking in young adults in other nations. For example, more than 40% of young adult males reported recent heavy drinking episodes in several nations including Belgium, Columbia, Ireland, the Netherlands, Poland, Slovakia, and the United States (Dantzer et al., 2010), and countries with larger proportions of university students showed higher rates of heavy and harmful drinking (Dantzer et al., 2010).

Similarly, marijuana is consumed at high rates amongst university students globally (Skidmore et al., 2016). In the United States, 38% of students regularly use marijuana while 21% had used marijuana in the most recent 3-week period (Schulenberg et al., 2017). Likewise,

marijuana has been identified as the most used illicit drug in the European Union consumed by 20% of university students (European Monitoring Centre for Drugs and Drug Addiction, 2019). South American countries such as Columbia, Peru, Bolivia, and Ecuador all report that marijuana is used most heavily and frequently in the 18-25 year age group with consumption rates similar to that of Europe at 17.2% (Hynes et al., 2015).

In South Africa, comprehensive data on alcohol and marijuana rates is somewhat limited, however, the national South African Stress and Health (SASH) study in 2002-2004 reported that alcohol abuse was the most common lifetime disorder (11.4%) (Williams et al., 2007). In comparison to other African countries included in the World Health Organization mental health surveys, South Africa has the highest alcohol consumption rate per person, with 33.1% of adults who regularly drink (Vellios & van Walbeek, 2018). Of the adult drinkers in South Africa, 29.2% meet the criteria for binge drinking and most notably, the age group in which the highest alcohol consumption rates occur is 18-30-year olds (Vellios & van Walbeek, 2018; Peltzer et al., 2011). South Africa, therefore, is no different from the other nations discussed above, as the alcohol consumption rate is highest in the university aged population (Peltzer et al., 2011) At a university in the Eastern Cape, 29% of the student population engaged in hazardous drinking while 7% were alcohol dependent (Young & de Klerk, 2008) and among first year students at two Western Cape universities the 12-month prevalence of a diagnosable alcohol use disorder was 5.6% (Bantjes et al., 2019). Alcohol is also the most dominant substance of abuse across all treatment sites in the country (Plüddemann et al., 2010). Marijuana on the other hand, is the most used illicit substance in South Africa, particularly amongst the country's youth with up to 29% of university students regularly using marijuana (Peltzer et al., 2018; Tesfai, 2016). Among first year university students, the 12-month prevalence of a diagnosable substance use disorder is 3.1% (Bantjes et al., 2019).

Both alcohol and marijuana are strongly associated with adverse effects (Vellios & van Walbeek, 2018). Alcohol, in particular, can have serious and harmful consequences when consumed in excess and can lead to the harm of both the individual and other members of society (WHO, 2018). Alcohol is associated with poor impulse control which can lead to various forms of violence such as fights, car accidents, injury, abuse, and suicide, the latter being highly correlated with younger age groups such as university students (WHO, 2018). Furthermore, alcohol can lead to foetal alcohol syndrome, as well as other diseases and health complications such as liver cirrhosis, cancer, and cardiovascular diseases (WHO, 2018). Excessive alcohol consumption amongst university students is further associated with

interpersonal problems amongst peers, anti-social problems including fighting, theft, and vandalism, as well as negatively affecting academic performance (McGee & Kypri, 2004). Marijuana is also associated with decreased impulse control resulting in risky and dangerous behaviour (Simons et al., 2012). A meta-analysis found that regular marijuana use can have an adverse impact on neurocognitive functioning of users when compared to non-marijuana users (Duperrouzel et al., 2020). In addition, marijuana and alcohol use are associated with an increased risk of mental disorders such as depression and anxiety, an increased risk of contracting HIV/AIDS and a higher likelihood of criminal activity (Peltzer et al., 2018)

In order to develop effective prevention and intervention strategies for alcohol and marijuana use in South Africa, it is imperative to understand the underlying motives that cause young adults to engage in substance use. As alcohol and marijuana have been identified as the most used substances in South Africa, and young adults are at particularly high risk of harmful alcohol and substance use, research into understanding motivations to use these substances is critical (Peltzer & Phaswana-Mafuya, 2018). Gaining knowledge on motivations for substance use can provide an insight into the amount of a substance an individual is likely to consume, the conditions under which they may consume the substance, and most importantly, understanding motivations can guide potential therapeutic intervention (Cooper, 1994).

Cooper et al. (1992) theorised three key motivations for engaging in alcohol use which were explored in the Drinking Motives Questionnaire (DMQ) which included social, enhancement, and coping motivations. Cooper et al. (1992) validated the 3-factor model for alcohol motivations in a longitudinal study with sample of 1616 adult participants, concluding the 3-factor structure to be an adequate fit for the data, with three distinguishable factors. Later, Cooper (1994) explored a 4-factor model for drinking motivations based on a conceptual model by Cox and Klinger (1988) which theorised that individuals consume alcohol in order to attain certain outcomes, and that different motivations for drinking will result in distinct patterns of alcohol use. Cooper (1994) modified the DMQ by including a fourth factor of conformity, renaming the scale the DMQ-R (Drinking Motives Questionnaire – Revised). The DMQ-R has subsequently provided the foundation of all research into motivations for substance use. Cooper's (1994) four motivations for drinking were categorised based on Cox and Klinger's (1988) theories of reinforcement, the source of the reinforcement as well as the internal and external rewards or states (Kuntsche et al., 2006). The two positively reinforced motives can be separated into enhancement and social motives – either an internally generated motive to enhance one's mood or drinking socially amongst peers for external social rewards (Cooper,

1994; Kuntsche et al., 2006). Negatively reinforced motives include coping and conformity motives which involve an internal motive to reduce negative affect or drinking to avoid the external state of social rejection. Cooper (1994) distinguished between positively and negatively reinforced drinking motives as they result in different drinking patterns: drinking for social motivations has been shown to be associated with lighter and more infrequent drinking amongst peers, whereas drinking for coping purposes can be linked to heavier and problematic drinking. Cooper (1994) conducted his exploratory research amongst adolescents aged 13-19 in the United States, finding the four-factor model to be an excellent fit for the data, with each item on the DMQ-R loading significantly onto one of the hypothesized factors, making the DMQ-R a more comprehensive model for assessing drinking motivations than its predecessor the DMQ.

Kuntsche et al. (2006) sought to extend Cooper's (1994) drinking motives theory to Europe to investigate whether the motivations of adolescents in Switzerland would differ from those in the United States. Using a sample of a similar age range to Cooper (1994) with adolescents of 12-18 years, Kuntsche et al. (2006) found support for the DMQ-R with high factor loadings and high correlations between the drinking motive factors. Cooper's (1994) four factor structure was an adequate fit for the data and high alpha values of .82-.88 were reported.

However, Cooper's (1994) motivations for alcohol use are not entirely exhaustive. Blackwell and Conrod (2003) argued that the coping motives factor did not engage fully with the complexity of using alcohol or substances for coping and that, rather, coping motives should be separated into two distinct motives – coping with anxiety and coping with depression. Blackwell and Conrod (2003) subsequently proposed a five-factor modified DMQ-R (MDMQ-R), for which Grant et al. (2007) conducted a Confirmatory Factor Analysis (CFA) in two separate samples of undergraduate students in the United States. The CFA found support for a five-factor structure and, further, the five-factor structure showed a better fit for the data than Cooper's (1994) four-factor model with its generic coping motive. Grant et al. (2007) reported that the coping depression motive, more so than the coping anxiety motive, was related to a larger quantity of drinks consumed at a single drinking event. However, drinking to cope with anxiety was more predictive of alcohol related problems, while drinking to cope with depression was only indirectly related due to the typically higher number of drinks consumed.

Grant et al. (2009) found further psychometric support for the MDMQ-R items in another sample of American university students, reporting high alpha results of .90 for all conformity items, .82 for enhancement items, .94 for coping-depression items, and .68 for coping-anxiety items. Support for the separate coping motives of anxiety and depression was again reported, with significant differences in drinking patterns between the two coping motives. There was a stronger relationship between conformity motives and coping-anxiety motives, perhaps because individuals with social anxiety are more likely to drink for conformity reasons. By contrast, conformity motives negatively moderated depressed mood drinking, thus clearly displaying the distinction between coping-anxiety and coping-depression motives.

Noting a lack of research exploring motivations for marijuana use, Simons and colleagues (1998) adapted Cooper's (1994) DMQ-R to the Marijuana Motives Measure (MMM). The MMM contains the four factors that Cooper (1994) had identified, namely enhancement, conformity, coping, and social motives, however with an additional fifth factor of expansion, due to the psychedelic nature of the drug. Simons et al. (1998) validated the MMM alongside the DMQ-R in a sample of undergraduate students, resulting in strong internal consistency with alpha scores ranging from .84-.94 for the factors. Additionally, construct validity was found for the added expansion motive. The motivations for initial use of marijuana and alcohol are distinguishable based on Simons and colleagues' (1998) results, as social and conformity motives were strong predictors of alcohol use, but not marijuana use. However, social motives were a strong predictor in marijuana-use related problems. Bonn-Miller and Zvolensky (2009) found further psychometric support for the 5-factor structure of the MMM in a sample of 200 adults in Vermont and reported high alpha coefficients ranging from .72-.92.

Benschop et al. (2015) evaluated the MMM with a slightly older sample of 18-30-year olds in the Netherlands. Benschop et al. (2015) analysed the MMM through a CFA, resulting in good internal consistency with alpha values ranging from .72-.85 for the motivations and significant inter-correlations for the scales. However, Benschop et al. (2015) added an additional motive of "Routine" to the questionnaire as it was argued that motivations that are unique to marijuana use such as boredom, relaxation, and habit were not explored in Simons and colleagues' (1998) scale. Benschop et al. (2015) employed an Exploratory Factor Analysis to examine the structure of the additional Routine items. Support was found for the Routine motive as six distinguishable factors were identified with internally consistent alpha values of

.68-.85 as well as significant intercorrelation between the routine factor and the original five factors. However, Benschop et al. (2015) noted that the sixth factor of routine might be conflated with a "just because" motivation and may obfuscate the real reasons individuals consume marijuana.

A large proportion of the research validating the MDMQ-R and MMM has been conducted with samples of adolescents and undergraduate students, predominantly in the United States (Kuntsche et al., 2006). There is therefore a paucity of knowledge on substance use motivations in populations outside of the United States, and particularly in low to middle income countries (Karam et al., 2007). Although it can be argued that the circumstances at a South African university, such as UCT, are not too dissimilar to an American university, there are still a great number of students who have very different cultural backgrounds to that of American undergraduate students and may have different motivations for substance use. Additionally, South African students may also have different contextual experiences when considering the country's history of colonisation, Apartheid, and persistent inequality which may frame the university experience and culture in particular ways, unique to South Africa. The many different languages spoken in South Africa, may also influence the reliability and validity of the motivation scales. The MMM and MDMQ-R's validity in an American population may not be upheld in a South African population and it is important to establish the transferability of these measures to determine their relevance to different population groups. Understanding the alcohol and substance use motives of South African university students could help inform prevention and intervention programmes on South African university campuses.

Although it is clear that alcohol and marijuana use are prevalent among South African university students and that identifying specific motivations for their use can help to inform effective interventions, there remains a lack of research identifying reliable and valid measures for assessing motivations for alcohol and substance use in South African university students. One study has reported on the psychometric properties of the DMQ-R in South African students, conducted at Rhodes University in the Eastern Cape (Maphisa & Young, 2018). Reliability and factor analyses were conducted on the scale, resulting in high Cronbach's alpha scores of .80 for all conformity motives and .88 for enhancement motives, thus proving the scale to be psychometrically sound. Within the student sample, it was found that social motives were the most common reason for alcohol use, followed closely by enhancement motives. However, the MDMQ-R with the 5-factor structure has not been validated with university

students in South Africa, while the psychometric properties of the MMM have not been explored at all in local populations to date.

The current study sough to conduct a confirmatory factor analysis of the MDMQ-R and the MMM in a sample of university students in South Africa. In addition, the study aimed to establish the concurrent validity of different substance use motives by examining and comparing their association with problematic substance use.

Method

Study Design

The study employed a cross-sectional survey design which incorporated the use of convenience sampling. Due to restrictions of COVID-19, the surveys for the study were completed online, however, the online format did allow for the study to be both time and cost effective with participants able to access the study from their own home computers. As participants could complete the study individually from their homes, this may have resulted in a decreased social desirability of the responses.

Sample

The sample for the study consisted of undergraduate psychology students studying at the University of Cape Town. An advertisement for the study (see Appendix H) was posted on the SRPP (Student Research and Participation Programme) website. All undergraduate psychology students have access to this website and could view the advertisement and choose to participate. The advertisement described the aims of the study, what was required of participants, and offered 1 SRPP point for completion of the study. The study did not have exclusion criteria.

In order to determine the ideal sample size for the study, the recommendation of Comrey and Lee (1992) was followed: a sample of 100 participants is poor, 200 is fair, 300 is good, 500 is very good, and over 1000 is excellent. For analyses using Cronbach's Alpha, the recommended sample size is roughly 200 (Bujang et al., 2018). After three weeks, there were a total of 345 respondents.

Instruments

Each of the participants was required to complete the following:

1. A brief demographic questionnaire with questions regarding age, year of study, gender, home language, and race (Appendix A). The latter two variables were included as language and race may be associated with particular experiences of stress or exclusion at a historically white institution like UCT, which may in turn impact on substance use patterns and substance use motives such as coping motives.

2. The Modified Drinking Motives Questionnaire-Revised (MDMQ-R; Grant et al., 2007) (Appendix B). Information on this scale is provided in the introduction above. An additional item was added to the questionnaire which is "To help me cope with my worries about the covid-19 pandemic in South Africa" in light of the current state of the country which may have an impact of students' substance use.

3. The Marijuana Motives Measure (MMM; Simons et al., 1998) (Appendix C). Information is provided in the introduction above. As with the MDMQ-R, an additional question regarding the covid-19 pandemic was added to the questionnaire.

4. The Rutgers Alcohol Problems Index (RAPI; White & Labouvie, 1989) (Appendix D). This survey has been designed to assess drinking-related problems in adolescents and young adults and has been validated in samples worldwide (Dick et al., 2011). Validation studies of the RAPI have indicated that adolescents who score highly on the questionnaire, show a strong likelihood of developing alcohol-related diagnoses in adulthood (Dick et al, 2011). Read et al. (2005) found psychometric support for the RAPI in a sample of university students in the USA, reporting a high alpha value of .88 and concluding it to be an adequate scale for assessing alcohol related problems in adolescents and young adults. López-Núñez et al. (2012) demonstrated that the RAPI can be successfully adapted to other countries and cultures in a validation study in Spain, in which the scale was translated and adapted to suit the Spanish sample. The results indicated that the RAPI had a high reliability with a Cronbach's alpha value of .87 and was deemed a successful measure for identifying problematic alcohol use (López-Núñez et al., 2012).

5. The Brief Marijuana Consequences Questionnaire (BMCQ; Simons et al., 2012) (Appendix E). The BMCQ is a shorter 21-item version of its original 50-item Marijuana Consequences Questionnaire (MACQ) which assesses the consequences of extended marijuana use. The BMCQ is the preferred measure to the MACQ as its survey items are more focused on

marijuana use and it has been shown to have a better discriminant validity than the full MACQ. The BMCQ has been validated frequently in university students in the United States, although Bravo et al. (2019) sought to extend the validation of the scale to four other countries, namely Argentina, the Netherlands, Spain, and Uruguay. Bravo et al. (2019) successfully validated the BMCQ finding it to be a valid scale for measuring marijuana related problems and confirmed its suitability and adaptability to different countries and cultures.

Procedure

The advertisement for the study (Appendix G) was uploaded onto the Psychology Department's SRPP website which contained a link to the surveys at the bottom of the advertisement. The advertisement informed students of the details of the study as well as the time it would take to complete the surveys, approximately 30-45 minutes.

Before the survey began, participants were required to complete an online consent form (Appendix F). The survey questions could not be accessed without the consent of the participant who was required to select AGREE at the bottom of the consent form, indicating that they agreed to participate. Included in the consent form, was a resource list of services and contacts for mental health and substance use support. Participants were then required to complete the demographic questions and the four scales which were created online using Google Forms. The four scales were combined into one document for the students to complete, rather than completing each scale individually. Once the survey had been completed, a link was provided to a separate Google forms survey which allowed them to enter their details, such as their names, student numbers and course codes, in order for them to receive their SRPP point. As this information was entered in a separate Google forms document, it could not be linked to responses on the substance use surveys which ensured anonymity.

Data Analysis

Descriptive statistics were calculated for the sample characteristics and each of the scales. A confirmatory factor analysis was performed for both the MDMQ-R and the MMM to assess whether the factors generated in the current study are similar to those identified by previous validation studies. An analysis of internal reliability was conducted by generating Cronbach's alpha values for the scales and sub-scales. Concurrent validity was assessed by correlating the scores on the MDMQ-R with the scores for the RAPI and correlating the scores

for the BMCQ with the scores of the MMM and a multiple regression analysis then was conducted to assess whether the different motive subscales predict harmful substance use.

Ethical Considerations

Before the study began, an ethical application was submitted to the Ethics Committee of the Department of Psychology, which approved the study's commencement. Participants were presented with a consent form prior to the study, which contained details of the study, what their participation would entail, as well as any potential risks or benefits to their participation. The survey questions could not be accessed without the participants' consent, which could be provided by selecting "Agree" at the end of the form. Survey responses remained anonymous as participants were not required to submit any identifying information when completing the surveys. However, in order to receive SRPP points, participants were directed to an additional survey link, separate from the substance use surveys, in which they could submit their names, student numbers, and course codes. The data were placed into an Excel spreadsheet in which the answers were de-identified in a numeric form and saved in a document on the password protected computers of the researchers. No raw data or individual data has been included in the results.

Results

The data from the surveys were transferred into an Excel spreadsheet. To address the missing data, it was decided that any participant who had not completed at least 80% of each scale would be excluded from the analysis. However, all participants did meet this threshold and so none were excluded. All analyses were conducted in RStudio

Sample characteristics

The study sample consisted of 345 undergraduate psychology students who had responded to the online survey. The mean age of the sample was 20.1 years (SD = 3.6) with more than half of the sample enrolled in their first year and almost a third in their second year of university. As can be seen in Table 1, the majority of the participants were female, with far fewer male and non-binary respondents. The most common race group that participants identified with was white, although the numbers of participants who selected "Coloured" or "African" as their race group were not much lower. The smallest identified race group was Indian and there was a small minority of the sample who selected "other". The majority of the

participants selected English as their home language with isiXhosa and isiZulu as the next most common home languages. Undergraduate psychology classes at UCT tend to skew towards female, white, English-speaking students which is reflected in the sample. The study sample is not representative of the university population, as white students contribute only 22% of the student population and 46% of the population is male, compared to the 17.1% of male respondents in this study (University of Cape Town, 2018).

Table 1

Sample characteristics:

	Frequency	%
Gender		
Male	59	17.1
Female	269	78
Non-binary	13	3.8
Race		
White	121	35.1
African	95	27.5
Coloured	99	28.7
Indian	18	5.2
Other	9	1.7
Home Language		
Afrikaans	14	4.1
English	259	75.1
Zulu	17	4.9
Xhosa	22	6.4
Venda	3	0.9
Southern Sotho	9	2.6
Northern Sotho	10	2.9
Twsana	10	2.9
Tsonga	2	0.6
Swati	3	0.9
Ndebele	3	0.9
Other	15	4.3
Year of Study		
1st Year	196	56.8
2nd Year	103	29.9
3rd Year	33	9.6
4th Year	10	2.9

N = 345

An audit was included in the survey questions to assess current alcohol and marijuana usage of the participants. As this study aimed to assess the psychometric properties of scales assessing motives for alcohol and marijuana use, only the participants who indicated that they had used either marijuana or alcohol in the month prior to the study were included in further data analysis. Of the total sample of 345, 48.9% (*n* = 169) reported past month alcohol use and 29.5% (*n* = 102) reported past month marijuana use. It is possible that the proportion of past-month alcohol and marijuana users was impacted by the COVID-19 lockdown and alcohol ban conditions in place in South Africa during data collection. There may have been less substance use than usual due to the lack of availability. Alternatively, the stress of the nationwide lockdown may have precipitated more substance use than normal, however, this is unlikely in light of the unavailability of substances and the expense of purchasing them illegally during the lockdown period.

Only the 169 participants who reported past-month alcohol use were included in the data analyses for the MDMQ-R and RAPI and only the 102 participants with past-month marijuana use were included in the analyses for the MMM and BMCQ.

Scale statistics

The maximum possible scores for each of the four scales are 290 for the MDMQ-R (*M* = 86.24, *SD* = 46.43), 69 for the RAPI (*M* = 11.94, *SD* = 8.39), 130 for the MMM (*M* = 45.45, *SD* = 23.72), and 21 for the BMCQ (*M* = 9.17, *SD* = 5.13). The scale statistics for the sample for the MDMQ-R, RAPI, MMM, and BMCQ are reported in Table 2 below.

Table 2

Descriptive scale statistics for the MDMQ-R, RAPI, MMM, and BMCQ

	N	Min	Max	*M*	*SD*	Std.Error
MDMQ-R	169	29	290	86.24	46.43	3.57
RAPI	169	0	69	11.94	8.39	0.61
MMM	102	26	130	45.45	23.72	2.34
BMCQ	102	0	21	9.17	5.13	0.48

Factor analysis of the MDMQ-R and MMM

For the MDMQ-R, the Kaiser-Meyer-Olkin (KMO) values indicated a high MSA value (.94) suggesting that there is good covariance between the data. KMO values are used as a means to test the sampling adequacy of the data to see if it is suitable for factor analysis (Field,

2013). All the KMO values were above .7 which are considered acceptable values and an indication of good covariation (Field, 2013). The subsequent Bartlett Test result was significant ($p < .001$) and a scree plot of the data displayed a recommended 3 factor structure, rather than the 5 factor structure for which Grant et al. (2007) had found evidence nor the 4 factor structure that Cooper (1994) proposed and Kuntsche et al. (2006) replicated. As the factor structure for the DMQ-R contained 4 distinct factors (Cooper, 1994), this factor structure was initially applied to the data. However, as expected, the 4-factor structure was not a suitable factor solution as there was no distinct or discernible fourth factor, despite rotating the data both with a varimax normalised rotation and an oblique rotation. A cut-off of .3 was applied to the factor loadings as loadings of $\geq .3$ are considered meaningful. The data were rotated in a varimax rotation which resulted in a cumulative variance of .6. The 29 questionnaire items were divided amongst the 3 identified factors which included a Coping factor (12 items), a Conformity factor (5 items) and a combined Social and Enhancement factor (12 items). The factor loadings for the MDMQ-R are reported in Table 3.

Table 3

Factor loadings for MDMQ-R

Questionnaire Item	Coping	Social/Enhancement	Conformity
1. As a way to celebrate		.65	
2. To relax		.57	
3. Because I like the feeling		.68	
4. Because it's what most of my friends do when we get together		.63	
5. To forget my worries	.72		
6. Because it's exciting		.63	
7. To be sociable		.68	
8. Because I feel more self-confident and sure of myself		.58	
9. To get a high		.54	
10. It is customary on special occasions		.43	
11. It helps me when I'm feeling nervous	.59		
12. It's fun		.86	
13. It makes social gatherings more enjoyable		.80	
14. To cheer me up when I'm in a bad mood	.71		
15. To be liked			.40

16. To numb my pain	.85			
17. It helps me when I'm feeling depressed	.87			
18. So that others won't kid me about not using				.61
19. To reduce my anxiety	.72			
20. To stop me from dwelling on things	.82			
21. To turn off negative thoughts about myself	.84			
22. To help me feel more positive about things in my life	.80			
23. To stop me from feeling so hopeless about the future	.84			
24. My friends pressure me to use				.86
25. To fit in with the group I like				.85
26. It makes me feel good			.66	
27. To forget painful memories	.84			
28. So I won't feel left out				.74
29. To help me cope with COVID-19	.46			

The same procedure was followed when conducting factor analysis for the MMM which displayed a good level of covariation between the questionnaire items with a high MSA value (.84). The KMO values for the MMM were lower than those computed for the MDMQ-R, however all values were above .5 which is the minimum requirement for factor analysis suitability. The Bartlett test further confirmed that the data was fit for factor analysis as it produced a significant result ($p < .001$). The parallel analysis and scree plot indicated that a 4-factor structure would be the best fit for the data, rather than the 5-factor structure originally proposed by Simons et al. (1998). A cut-off of .3 was applied to the factor loadings as well as an oblique rotation which produced a cumulative variance of .6. The identified 4 factors included a Coping factor (6 items), a Conformity factor (5 items), an Expansion factor (6 items), and, similar to the results for the MDMQ-R, a combined Social and Enhancement factor (9 items). The factor loadings for the MMM are reported in Table 4.

Table 4

Factor loadings for MMM

Questionnaire item	Social/ Enhancement	Expansion	Conformity	Coping
1. To forget my worries				.96

2.	Because my friends pressure me to use marijuana			.80		
3.	It helps me enjoy a party	.75				
4.	It helps me when I am depressed or nervous					.60
5.	To be sociable					.44
6.	To cheer me up when I'm in a bad mood					.64
7.	I like the feeling					.60
8.	So that others won't kid me about not using marijuana			.93		
9.	It's exciting	.83				
10.	To get high	.50				
11.	It makes social gatherings more fun	.89				
12.	To fit in with the group I like			.81		
13.	It gives me a pleasant feeling	.46				
14.	It improves parties and celebrations	.90				
15.	I feel more self-confident and sure of myself	.48				
16.	To celebrate a special occasion	.77				
17.	To forget my problems					.92
18.	It's fun	.73				
19.	To be liked			.78		
20.	So I won't feel left out			.77		
21.	To know myself better		.83			
22.	It helps me be more creative and original		.80			
23.	To understand things differently		.90			
24.	To expand my awareness		.86			
25.	To be more open to experiences		.59			
26.	To help me with my anxiety about COVID-19		.34			

Table 5 displays the average scores and Cronbach's alpha values for each of the subscales of both the MDMQ-R and the MMM.

Table 5

Sub-scale Statistics

Subscale:	Number of items	Cronbach's Alpha	*M*	*SD*	*N*
MDMQ-R Social/Enhancement	12	.4	53	24.44	169
MDMQ-R Coping	12	.46	26.55	21.67	169
MDMQ-R Conformity	5	.49	9.41	6.89	169
MMM Social/Enhancement	9	.52	27.93	9.87	102
MMM Expansion	6	.5	13.6	7.35	102
MMM Coping	6	.51	16.14	7.853	102
MMM Conformity	5	.52	7.69	4.27	102

The Cronbach's alpha values that were generated were quite low, and therefore, correlation matrices were produced for each subscale in order to assess if particular questionnaire items were reducing the alpha value. For the MDMQ-R social/enhancement subscale, item 10, "Because it is customary on special occasions", was the least correlated item in this subscale. However, removing item 10 increased the Cronbach's alpha value only slightly from .38 to .4. The additional item 29 of the MDMQ-R, "To help me cope with my worries about the COVID-19 pandemic" was the least correlated item on the Coping subscale. Removing this item from the subscale resulted in a small increase in the alpha value from .43 to .46. The additional item 26 of the MMM, "To help me cope with my worries about the COVID-19 pandemic" was intended to form part of the Coping subscale, however, it had a higher factor loading on the Expansion subscale. It was the least correlated item on the Expansion subscale; however, its removal did not improve the alpha value.

To assess whether language issues may have impacted the way in which items were answered, the data were divided between the first language English speakers and second language English speakers and the Cronbach's alpha values for the subscales were computed for both groups. The alpha values of the subscales for the English first language speakers ranged from .6 to .69 whereas the alpha values for the second-language English speakers were lower, ranging from .4-.54. This suggests that second-language English speakers may have responded to some items in ways that reduced the internal reliability of the subscales.

However, according to Loewenthal (1996), Cronbach's alpha values of ≤ .6 are acceptable for shorter scales of less than 10 items; all the subscales of the MMM and the Conformity subscale of the MDMQ-R fall within this threshold.

Concurrent validity

The concurrent validity of the MDMQ-R and the MMM was assessed through the use of correlations. The MDMQ-R subscale scores were correlated with the RAPI total score to assess whether the different alcohol use motives are associated with severity of alcohol use. The MMM subscale scores were correlated with the BMCQ total score to assess whether the different marijuana use motives are associated with severity of marijuana use. As seen in Table 6, the correlation values of the MDMQ-R subscales with the RAPI were quite low (.11 - .55) but all were significant. The correlations between the MMM subscales and the BMCQ were higher (.2-.63) and all were significant except for the MMM Conformity subscale

Compared to the other subscales, the coping motive subscales on the MDMQ-R and the MMM have the strongest correlation with the RAPI ($p \leq .001$) and BMCQ ($p \leq .001$) respectively, indicating that using substances for coping reasons is associated with higher scores on the problems of use scales than are other motives for use.

Table 6

Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9
1. MDMQ-R Social/Enhancement	1								
2. MDMQ-R Coping	0.56***	1							
3. MDMQ-R Conformity	0.34***	0.25***	1						
4. RAPI	0.21**	0.28***	0.11*	1					
5. MMM Social/Enhancement	-0.11	-0.16*	-0.19**	-0.04	1				
6. MMM Expansion	0.02	-0.12*	-0.11*	0.14*	0.64***	1			
7. MMM Coping	-0.3	-0.13*	-0.13*	0.11*	0.68***	0.72**	1		
8. MMM Conformity	-0.2	-0.05	0.01	-0.03	0.14*	0.22*	0.1*	1	
9. BMCQ	0.03	-0.05	0.01	0.16*	0.5***	0.6***	0.63***	0.2	1

*p ≤ .05. **p ≤.01 ***p ≤.001

A multiple regression analysis was then performed in order to determine the predictive value for substance use of each of the subscales. As reported in Table 7, for the MDMQ-R, only the Coping motive subscale ($p = .00$) was found to be a significant predictor of problematic

alcohol use when considered simultaneously with the other motive subscales. Although the model was significant (p = .002), the adjusted R^2 value indicates than only 6% of the variance in problematic alcohol use is explained in the model. As reported in Table 8, both the Coping motive (p = .04) and Expansion motive (p = .01) subscales on the MMM predicted severity of marijuana use. The predictive model for the MMM subscales was not only significant ($p < .001$), but also had a larger adjusted R^2 value than the model for the MDMQ-R, with 38% of the variance in marijuana related problems explained.

Table 7

MDMQ-R motive subscale scores as predictors of high RAPI scores:

Predictors:	Std. Error	*t*	*P*	*N*
Intercept	1.55	5.07	.000***	
Coping	0.03	2.64	.008**	169
Social/Enhancement	0.03	0.77	.44	169
Conformity	0.09	0.33	.739	169

Adjusted R^2 = .06 p = .002

Table 8

MMM motive subscale scores as predictors of high BMCQ scores

Predictors	Std. Error	*T*	*p*	*N*
Intercept	1.30	0.38	.700	
Coping	0.07	2.07	.040*	102
Social/Enhancement	0.05	1.35	.177	102
Conformity	0.09	0.36	.717	102
Expansion	0.08	2.64	.010*	102

Adjusted R^2 = .38 p < .001

Discussion

The first aim of this study was to validate the factor structure of the MDMQ-R and the MMM in a sample of university students outside of the North American or European context. The motivation factors identified in previous validation studies were only partially replicated in our sample of South African university students. The findings for the MDMQ-R and the MMM are discussed respectively below.

With regards to the MDMQ-R, support was not found for Cooper's (1992) initial 3 factor model, which comprised of social, enhancement, and coping factors, Cooper's (1994) revised 4-factor model, which included a conformity factor, nor Grant and colleagues' (2007) 5-factor structure with separated depression and anxiety coping motives. Rather, a 3-factor structure was the most suitable fit for the data, with a combined social and enhancement factor, a coping factor, and a conformity factor. However, all the MDMQ-R factors had Cronbach's alpha values below .5. While this may be acceptable for the coping subscale due to its small number of items (Loewenthal, 1996), it is more concerning for the coping and social/enhancement subscales.

The mean score for the MDMQ-R conformity subscale was relatively low at 9.41 considering the maximum score for the subscale is 50. Benschop et al. (2015) and Cooper (1994) had noted that substance use was less likely to be motivated by conformity in older samples, with younger samples, such as adolescents, far more likely to consume alcohol or marijuana due to conformity motivations. The low mean of the conformity subscale is a possible reflection of this, as perhaps the slightly older sample of university students, in comparison to Cooper's (1994) adolescent sample, are more likely to drink alcohol for social and enhancement motives or coping motives than conformity motives. Alternatively, the low mean for the conformity motives could be attributed to the nationwide lockdown and forced isolation, meaning that individuals may have been less likely to consume alcohol due to social pressure.

Although the 3-factor structure is not in line with previous validation studies (Grant et al., 2007; Kuntsche et al., 2006), the combination of the social and enhancement factors is not entirely surprising as both Grant et al. (2007) and Kuntsche et al. (2006) reported high correlations between the two motives. Grant et al. (2007) reported a correlation between social and enhancement of .82 which is very near to the redundancy cut-off of .85, possibly indicating that social and enhancement items may overlap and be asking similar questions. Furthermore, in the establishment of the MMM, Simons et al. (1998) validated the DMQ-R and also reported a combined social and enhancement factor. The high correlation and the merging of these two factors can be somewhat expected, taking into account the environment and behaviour of alcohol use in the university environment as drinking frequently occurs in social settings in which heavy drinking is encouraged and accepted such as at parties or bars (Cooper, 1994; Simons et al., 1998). Drinking alcohol at parties is often concurrently done for social and

enhancement motives, and it is therefore understandable that these motives are not only related, but why they have merged into one factor in this study.

Attempting the 5-factor structure of the MDMQ-R on our data produced an incoherence in factor loadings, with several unrelated items loading on to the first three factors. Therefore, the 5-factor structure had to be abandoned for the more appropriate 3 factor structure. The inability to find support for a 5-factor solution is potentially due to the small sample size of the study (N = 169) which Lingard and Rowlinson (2007) note can lead to false conclusions and misguided interpretations of the "strength" of the data. Larger samples reduce sampling error and produce more accurate factor structures and are less susceptible to issues such as splintering (division of factors into smaller groups which are actually part of one factor) or misclassified items (the loading of items onto the incorrect factor). Although splintering was not a concern in our data set, misclassified items did occur as item 26 of the MMM, "To help me cope with my worries about the COVID-19 pandemic", had incorrectly loaded onto the Expansion factor rather than the coping factor. Previous validation studies, such as Grant et al. (2007) had a much larger sample size of 726 for the first study, and 603 for the second part of their study. The smaller sample size of the current study might have restricted the variation in depression and anxiety-based coping motives meaning that the factor structure of the coping-anxiety and coping-depression factors was highly unstable.

As with the MDMQ-R, support for the original factor structure was not found for the MMM. A 4-factor structure was the most adequate fit for the data rather than the 5-factor structure proposed by Simons et al. (1998) and confirmed by Benschop et al. (2015). The conformity, coping, and expansion factors of Simons and colleagues' (1998) structure were replicated in our sample, but again, the social and enhancement factors combined into a single factor. It seems that the conditions under which alcohol is consumed amongst university students can also be applied to marijuana, with students being likely to use marijuana in social settings for enhancement motives. Although the Cronbach's alpha values for the MMM are .5-.52, each of the subscales does have less than 10 items, and therefore have acceptable internal reliability (Loewenthal, 1996).

The low Cronbach's alpha values on both the MDMQ-R and the MMM could be attributed to the low sample size, as according to Bujang et al. (2018), a sample of 200 participants is recommended. However, due to the reduction in the sample of 345 participants to 169 past-month alcohol users and 102 past-month marijuana users, our sample sizes for each

of these groups did not meet the recommended threshold. The low alpha values could also be due to differing interpretations of some of the questionnaire items by first-language English versus second-language English speakers in the sample. Although all UCT students can speak English as this is the language of instruction at the university, there are several students who speak English as a second language and may not be as fluent or as nuanced in the language as it is not their first. Some of the items of the questionnaires therefore may have been interpreted by second-language English speakers in a way that differed from their intended meaning which could mean second language English speakers may have answered questionnaire items differently than the first language English speakers. Furthermore, the surveys were designed and established in the United States which could mean that the wording of specific questionnaire items may not be as familiar to South African students, and more specifically to second language English speakers. For example, item 18 on the MDMQ-R "So that others won't kid me for not using", the phrasing of this item might be slightly outdated as the item was written in the 1990's and does seem more in line with American colloquialism meaning that it might not have been too appropriate for a young South African sample.

Predictive value of substance use motives

A second aim of the study was to explore the value of different substance use motives as predictors of problematic substance use. For the 4-factor DMQ-R, Cooper (1994) previously found that both coping and conformity motives predicted drinking problems while Kuntsche et al. (2006) reported that coping and enhancement motives predicted alcohol-related problems. However, for our sample, coping motives were the only motive that predicted alcohol use problems, which is in line with Grant and colleagues' (2007) findings for the MDMQ-R. For the MMM, both the coping and expansion motives predicted marijuana related problems. Benschop et al. (2015) reported a link between coping motives and marijuana dependence and Bonn-Miller et al. (2009) noted the significant association of expansion motives and marijuana abuse. The social/enhancement and conformity motives therefore appear to be poor predictors of problematic substance use across both the MDMQ-R and the MMM in our sample. It is possible that these motives are less prominent for young adults than for adolescents, with harmful alcohol use in the former being driven more by the desire to attain certain psychological states (such as absence of negative feelings, or enhanced positive feelings, creativity and self-understanding) than by social/peer factors. It is also possible that in the context of the COVID-19 lockdown and remote learning, coping and enhancement motives became more important drivers of substance use than social motives.

The prediction models for both the MDMQ-R and the MMM confirm the value of examining specific substance use motives when trying to understand why some South African university students develop substance use problems while others may engage in non-harmful use. However, the motives for alcohol use, while significant, explained only a small amount of variance in alcohol use problems. This suggests that other factors may be more important. It may be valuable for future research to examine whether alcohol use motives are more important for some users than for others in predicting problematic alcohol use. By contrast, marijuana use motives, specifically coping and enhancement motives, explained a more substantial amount of the variance in marijuana use problems, indicating that they are important factors to target in prevention and intervention programmes for harmful marijuana use.

Limitations:

While our study found significant associations between the motive subscales and substance use problems, due to the cross-sectional design of the study no firm conclusions or generalizations can be drawn. As is the case with all survey-based studies, caution must be taken when examining the results as bias is associated with self-administered surveys in which socially desirable responses are common (Shrier & Schere, 2014). The sample characteristics and sample size present further limitations for the applicability and validity of the study's results. The predominantly white, female, and English-speaking sample is not an accurate reflection of the University of Cape Town nor university students in South Africa and therefore, the results cannot be generalized to all university students. However, the results from the regression analysis are in accordance with findings from previous validation studies reporting the association of motive subscales and substance use problems, although, many of the samples from previous studies also consisted of undergraduate psychology students, and therefore, our prediction models are in line with other psychology students, rather than university students in general. The sample size for this study was much smaller than that of previous validation studies (Benschop et al., 2015, Grant et al., 2007) and was reduced further due to the audit which eliminated all respondents who had not consumed either alcohol or marijuana in the month prior to the study. The inclusion of the audit, while intended to establish current alcohol and marijuana use, may not be a true representation of current substance use due to the alcohol ban in place during the study. Excluding participants who did not consume alcohol may have affected the results of the study as it is possible that several participants who had not used alcohol during the lockdown alcohol ban in South Africa, do drink regularly and thus have drinking motivations but simply did not have access to alcohol in the month prior to the study.

Finally, conducting the study, which was part of a postgraduate degree and therefore could not be postponed, during the COVID-19 lockdown may have yielded results that are inconsistent with what may have emerged during a regular academic year. It is therefore important that replication studies be conducted in the future.

Although the sample for our study is not entirely representative of university students in South Africa, or of a normal academic year, it is notable that our study has confirmed previous findings regarding the importance of coping motives in predicting problematic use of both alcohol and marijuana. These accumulating findings regarding the importance of coping motives, and of expansion motives for marijuana use, can potentially form the basis of intervention and prevention strategies. As both alcohol and marijuana are the most widely and most heavily used substances in South Africa, it is imperative to gain further insight into the motivations that trigger substance use in order to develop necessary intervention and prevention programmes. However, future studies desiring to investigate substance use motivations should extend their research beyond the psychology departments of universities to a campus-wide sample in order to obtain a more accurate reflection of the patterns of use and motivations so that more effective intervention programmes can be designed to fit the campus population's needs. Furthermore, the substance use motivations of the general population may differ from those of university students and urgently need to be explored. Additionally, future research should consider translating the MDMQ-R and MMM or perhaps rephrasing the questionnaire items in order to ensure that the scales are more accessible and understandable to a South African population which may yield more accurate results of substance use motivations.

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Appendix A:

Brief Demographic Questionnaire:

Please fill in all the necessary information:

How old are you? _____

Which year of study are you currently in? _____

Which gender do you identify with? (please tick the relevant box)

Male	
Female	
Non-binary	
Prefer not to choose	

Which race group do you identify with? (please tick the relevant box)

White	
African	
Coloured	
Indian	
Other	
Prefer not to choose	

Which of the following is your first home language? (please tick the relevant box)

Afrikaans	
English	
Zulu	
Xhosa	
Venda	
Sothern Sotho	
Northern Sotho	
Tswana	
Tsonga	
Swati	
Ndebele	

Appendix B: MDMQR

INSTRUCTIONS: Listed below are 29 reasons people might be inclined to drink alcohol. Using the scale, decide how frequently your own alcohol use is motivated by each of the reasons listed.

	Never **Always**
As a way to celebrate	0 1 2 3 4 5 6 7 8 9 10
To relax	0 1 2 3 4 5 6 7 8 9 10
Because I like the feeling	0 1 2 3 4 5 6 7 8 9 10
Because it is what most of my friends do when we get together	0 1 2 3 4 5 6 7 8 9 10
To forget my worries	0 1 2 3 4 5 6 7 8 9 10
Because it is exciting	0 1 2 3 4 5 6 7 8 9 10
To be sociable	0 1 2 3 4 5 6 7 8 9 10
Because I feel more self-confident or sure of myself	0 1 2 3 4 5 6 7 8 9 10
To get a high	0 1 2 3 4 5 6 7 8 9 10
Because it is customary on special occasions	0 1 2 3 4 5 6 7 8 9 10
Because it helps me when I am feeling nervous	0 1 2 3 4 5 6 7 8 9 10
Because it's fun	0 1 2 3 4 5 6 7 8 9 10
Because it makes a social gathering more enjoyable	0 1 2 3 4 5 6 7 8 9 10
To cheer me up when I'm in a bad mood	0 1 2 3 4 5 6 7 8 9 10
To be liked	0 1 2 3 4 5 6 7 8 9 10
To numb my pain	0 1 2 3 4 5 6 7 8 9 10
Because it helps me when I am feeling depressed	0 1 2 3 4 5 6 7 8 9 10
So that others won't kid me about not using	0 1 2 3 4 5 6 7 8 9 10
To reduce my anxiety	0 1 2 3 4 5 6 7 8 9 10
To stop me from dwelling on things	0 1 2 3 4 5 6 7 8 9 10
To turn off negative thoughts about myself	0 1 2 3 4 5 6 7 8 9 10
To help me feel more positive about things in my life	0 1 2 3 4 5 6 7 8 9 10
To stop me from feeling so hopeless about the future	0 1 2 3 4 5 6 7 8 9 10
Because my friends pressure me to use	0 1 2 3 4 5 6 7 8 9 10
To fit in with a group I like	0 1 2 3 4 5 6 7 8 9 10

Because it makes me feel good	0 1 2 3 4 5 6 7 8 9 10
To forget painful memories	0 1 2 3 4 5 6 7 8 9 10
So I won't feel left out	0 1 2 3 4 5 6 7 8 9 10
To help me cope with my worries about the covid-19 pandemic in South Africa.	0 1 2 3 4 5 6 7 8 9 10

Appendix C:

Marijuana Motives Measure (MMM): Listed below are 26 reasons people might be inclined to smoke marijuana. Using the scale, decide how frequently your own marijuana use is motivated by each of the reasons listed. If you have never used marijuana, please indicate almost never/never for each item.

	Almost never /never	Some of the time	Half of the time	Most of the time	Almost always/always
To forget my worries					
Because my friends pressure me to use marijuana					
Because it helps me enjoy a party					
Because it helps me when I feel depressed or nervous					
So that others won't kid me about not using marijuana					
Because it's exciting					
To get high					
Because it makes social gatherings more fun					
To fit in with the group I like					
Because it gives me a pleasant feeling					
Because it improves parties and celebrations					
Because I feel more self-confident and sure of myself					
To celebrate a special occasion with friends					
To forget about my problems					

Because it’s fun					
To be liked					
So I won’t feel left out					
To know myself better					
Because it helps me be more creative and original					
To understand things differently					
To expand my awareness					
To be more open to experiences					
To help me with my concerns about the covid-19 pandemic					

Appendix D:

The Rutgers Alcohol Problems Index (RAPI)

These are questions about your use of alcohol.

Have you had any alcohol in the past 30 days (one month)? **(**mark the correct answer with X).

No	
Yes	

How often do you have a drink containing alcohol? (mark the correct answer with X)

Never	
Once a month or less	
2-4 times a month	
2-3 times a week	
4 times a week or more often	

How many drinks containing alcohol do you have on a typical day when you are drinking? (mark the correct answer with X)

I don’t drink alcohol		
1-2 times a day		
3-4 times a day		
5-6 times a day		
7 times or more		

How many times has this happened to you while you were drinking alcohol or because of your drinking alcohol during the last year? (mark the correct answer with a X)

	None	**1-2 times**	**3-5 times**	**More than 5 times**
1. Not able to do your homework or study for a test				
2. Got into fights with other people (friends, relatives, strangers)				
3. Missed out on other things because you spent too much money on alcohol				
4. Went to work or school high or drunk				
5. Caused shame or embarrassment to someone				
6. Neglected your responsibilities				
7. Relatives avoided you				
8. Felt that you needed more alcohol than you used to in order to get the same effect				
9. Tried to control your drinking (tried to drink only at certain times of the day or in certain places, that is, tried to change your pattern of drinking)				
10. Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking				

11. Noticed a change in your personality				
12. Felt that you had a problem with alcohol				
13. Missed a day (or part of a day) of school or work				
14. Wanted to stop drinking but couldn't				
15. Suddenly found yourself in a place that you could not remember getting to				
16. Passed out or fainted suddenly				
17. Had a fight, argument or bad feeling with a friend while drinking alcohol or because of your drinking				
18. Had a fight, argument or bad feeling with a family member while drinking alcohol or because of your drinking				
19. Kept drinking when you promised yourself not to				
20. Felt you were going crazy while drinking alcohol or because of your drinking				
21. Had a bad time while drinking alcohol or because of your drinking				
22. Felt physically or psychologically dependent on alcohol				
23. Was told by a friend, neighbour or relative to stop or cut down drinking				

Appendix E:

Brief Marijuana Consequences Questionnaire (BMCQ)

These are questions about your use of marijuana (also called dagga, cannabis, weed or dope).

Have you had any marijuana in the past 30 days (one month)? **(**mark the correct answer with X).

No	
Yes	

How often do you use marijuana? (mark the correct answer with X)

Never	
Once a month or less	
2-4 times a month	
2-3 times a week	
4 times a week or more often	

How many times do you use marijuana on a typical day when you use marijuana? (mark the correct answer with X)

I don't use marijuana	
1-2 times a day	
3-4 times a day	
5-6 times a day	
7 times of more	

In the past 30 days (one month)…(mark the correct answer with X)

	No	**Yes**
1. The quality of my work or schoolwork has suffered because of my marijuana use.		
2. I have driven a car when I was high.		
3. I have felt in a fog, sluggish, tired, or dazed the morning after using marijuana.		
4. I have been unhappy because of my marijuana use.		
5. I have gotten into physical fights because of my marijuana use.		
6. I have spent too much time using marijuana.		
7. I have felt like I needed a hit of marijuana after I'd gotten up (that is, before breakfast).		
8. I have become very rude, obnoxious, or insulting after using marijuana.		
9. I have been less physically active because of my marijuana use.		
10. I have had trouble sleeping after stopping or cutting down on marijuana use.		
11. I have neglected obligations to family, work, or school because of my marijuana use.		
12. When using marijuana I have done impulsive things that I regretted later.		
13. I have awakened the day after using marijuana and found I could not remember a part of the evening before.		
14. I have been overweight because of my marijuana use.		
15. I haven't been as sharp mentally because of my marijuana use.		

16. I have received a lower grade on an exam or paper than I ordinarily would have because of marijuana use.		
17. I have tried to quit using marijuana because I thought I was using too much.		
18. I have felt anxious, irritable, lost my appetite or had stomach pains after stopping or cutting down on marijuana use.		
19. I often have thought about needing to cut down or to stop using marijuana.		
20. I have had less energy or felt tired because of my marijuana use.		
21. I have lost motivation to do things because of my marijuana use.		

Appendix F: Consent Form:

Study Title: Reliability and validity of the Modified Drinking Motives Questionnaire – Revised (MDMQ-R) and the Marijuana Motives Measure (MMM in a sample of South African university students.

The current study:

This study aims to assess the reliability and validity of two already established surveys on substance use motivations, namely the Marijuana Motives Measure (MMM) and the Modified Drinking Motives Questionnaire-Revised (MDMQ-R). The questionnaires have items which will require participants to answer questions on the reasons they engage in marijuana and alcohol use in each respective survey. In addition to these two surveys, participants will also be required to complete another two surveys, namely the Rutgers Alcohol Problems Index (RAPI) and the Brief Marijuana Consequences Questionnaire (BMCQ).

Participation:

All participants should be between the ages of 18-25 as the study aims to assess the alcohol and marijuana motivations in young adults. Participation in the study is entirely voluntary, and you are not obliged to complete the study, withdrawal is permitted at any point. On completion of the study, 1 SRPP point will be awarded and this point will be held over until the next academic year. However, should you choose not to participate or later decide to discontinue participation in the study, there will be other ways for you to earn SRPP points.

Confidentiality:

All survey responses will be anonymous as no identifying data will be linked to responses. Identifying information such as names, student numbers, and course codes will be required in order for the researchers to award SRPP points, however this information will be entered in a separate web page. The survey data, and student identifying data will be kept separate and stored on the password protected computers of the researchers.

Costs:

There are no financial costs to this study as you will be able to access the surveys from your own mobile devices. However, a cost of mobile data may be required if you do not have internet access. The study will take approximately 30-45 minutes to complete, so you will need to be able to set aside this time.

Risks and Benefits:

There are few risks to participation in this study, however, should you feel any discomfort or distress during the process of answering the surveys, you are free to withdraw and discontinue participation. Contact information for facilities and resources to help with mental illness and substance use will be provided.

On completion of the study, you will earn 1 SRPP point. In addition, the information gained from this study can be used to plan and create potential intervention and prevention strategies for substance use of young adults in a South African context.

Study results:

The results from the study will be documented in an Honours project, but will be presented in summary form and therefore, no individual responses will be reported.

Contacts:

If you have any questions about the study, please feel free to contact one of the researchers of the study, either Robyn Wimberley at robynlaura206@gmail.com, or Sipho Xayimpi at XYMSIP001@myuct.ac.za.

If you are concerned in any way about your own or another's substance use, or are experiencing any difficulties with mental health, please contact any of the following resources:

UCT STUDENT WELLNESS SERVICE: Health service: 021 6501020Counselling service: 021 6501017http://www.students.uct.ac.za/students/support/health-counselling/student-wellness

UCT STUDENT CARELINE: 0800 24 25 26 (free from a Telkom line) or send an SMS to: 31393 for a "call-me-back" service.

CAPE TOWN DRUG COUNSELLING CENTRE (OBSERVATORY): 021 4478026 or http://www.drugcentre.org.za/0214478026 0214478026 0214478026

DEPARTMENT OF SOCIAL DEVELOPMENT SUBSTANCE ABUSE LINE 24HR HELPLINE

0800 12 13 14

SMS 32312

LIFELINE WESTERN CAPE:

Telephone counselling:

WHATSAPP – 063 709 2620 or 021 4611111 (landline call subject to normal Telkom rates) between (09h30 to 22h00) daily

Face to face counselling: Call 021 4611113 (town) or 021 361 9197 (Khayelitsha) to book an appointment

SADAG:011 234 4837 or http://www.sadag.org/

Destiny Helpline for Youth & Students:
0800 41 42 43

By clicking "AGREE" you have read all the information above and are agreeing to participate in the study. If you do not want to participate, do not select "AGREE" and exit the survey.

Appendix G: SRPP Advert

INVITATION TO TAKE PART IN A RESEARCH STUDY ON THE MOTIVES BEHIND SUBSTANCE USE AMONG UNIVERSITY STUDENTS – EARN 1 SRPP POINT

We would like to invite you to volunteer by taking part in a new research study on what motivates substance use among UCT students. This study is part of a local research study that is interested in the reasons behind substance use among university students.

What will your participation in this project involve?

For this study, you will need to complete an online survey which should take approximately 30-45 minutes. The survey will contain questions about alcohol and marijuana use and the reasons that people commonly use each of the substances.

Who can take part?

Any Psychology student at UCT who is 18 and older is eligible to take part in the study. It is also important to note that you do not have to use marijuana and alcohol to take part in this study.

Do you have to take part?

Your participation in this research study is completely voluntary, and you can decide not to participate and earn your SRPP points in other ways that are more suitable to you.

Will my answers to the survey be confidential and anonymous?

Your answers to the survey questions will not be traced back to your identity. Responses will be completely anonymous. To ensure anonymity, your name and your student details will be required on a separate link in order for you to receive your SRPP point. All the information you will provide for you SRPP point will not be linked to your replies on the survey.

Are there any risks involved?

There are very few risks to participating in this study. You may feel some discomfort or distress when answering some of the questions about alcohol or marijuana use, however, you can leave out an item if you do not want to respond. You are also free to withdraw from the study at any time, however, SRPP point will only be given to those who complete the whole survey.

Are there any benefits to taking part?

On completion of the survey, you will receive an SRPP point which will be carried over to the next academic year. Other benefits include the opportunity to help South African students, both at UCT and other universities in the country, as the results from the study will be used to design appropriate interventions for addressing substance abuse in universities.

Who can you contact if you have questions about this study?

If you have any questions about the study, please feel free to contact one of the researchers of the study, either Robyn Wimberley at robynlaura206@gmail.com, or Sipho Xayimpi at XYMSIP001@myuct.ac.za or the research supervisor A.Prof Debbie Kaminer at Debbie.kaminer@uct.ac.za.

If you are concerned in any way about your own or another's substance use, or are experiencing any difficulties with mental health, please contact any of the following resources:

UCT STUDENT WELLNESS SERVICE: Health service: 021 6501020Counselling service: 021 6501017http://www.students.uct.ac.za/students/support/health-counselling/student-wellness

UCT STUDENT CARELINE: 0800 24 25 26 (free from a Telkom line) or send an SMS to: 31393 for a "call-me-back" service.

CAPE TOWN DRUG COUNSELLING CENTRE (OBSERVATORY): 021 4478026 or http://www.drugcentre.org.za/0214478026 0214478026 0214478026

DEPARTMENT OF SOCIAL DEVELOPMENT SUBSTANCE ABUSE LINE 24HR HELPLINE

0800 12 13 14

SMS 32312

LIFELINE WESTERN CAPE:

Telephone counselling:

WHATSAPP – 063 709 2620 or 021 4611111 (landline call subject to normal Telkom rates) between (09h30 to 22h00) daily

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Call 021 4611113 (town) or 021 361 9197 (Khayelitsha) to book an appointment

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Destiny Helpline for Youth & Students:

0800 41 42 43