



Short Communication

Reliability and validity of the Marijuana Motives Measure among young adult frequent cannabis users and associations with cannabis dependence



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HIGHLIGHTS

- Factor analysis of the MMM confirmed a 5-factor structure.
- The original MMM was extended with a sixth factor pertaining to routine motives.
- Coping and routine motives were associated with cannabis dependence.
- The MMM seems reliable and valid in a population of frequent cannabis users.

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ABSTRACT

The Marijuana Motives Measure (MMM) has so far been examined mainly in student populations, often with relatively limited involvement in cannabis use. This study evaluated the factor structure of the MMM in a demographically mixed sample of 600 young adult (18–30 years) frequent (≥ 3 days per week) cannabis users in the Netherlands. Analysis confirmed a five-factor solution, denoting coping, enhancement, social, conformity and expansion motives. Additionally, the original MMM was extended with two items (boredom and habit), which formed a distinct, internally consistent sixth factor labelled routine motives. In a multivariable logistic regression analysis, coping and routine motives showed significant associations with 12-month DSM-IV cannabis dependence. The results suggest general reliability and validity of the MMM in a heterogeneous population of experienced cannabis users.

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1. Introduction

Although the addiction potential of cannabis is relatively low (Lopez-Quintero et al., 2011), due to high prevalence rates (11.7% of Europeans aged 15–34, last year prevalence), cannabis use constitutes 26.3% of drug treatment demand in Europe (EMCDDA, 2013) and cannabis dependence is a significant contributor to the global burden of disease (Degenhardt et al., 2013). Understanding why people use cannabis and the relation between motives and cannabis dependence is critical in the development of prevention and treatment of cannabis use disorders. Past research in the field of risky health-related behaviours has established that differences in affect and behavioural regulation motives predict differences in patterns of drinking behaviours (Cooper, 1994). In order to better understand the motives for cannabis use, Simons and

colleagues (Simons, Correia, Carey, & Borsari, 1998) modified an alcohol motive questionnaire to measure motives for marijuana use. With this Marijuana Motives Measure (MMM) five different motives for using cannabis could be distinguished; enhancement, social, coping, conformity and expansion motives. Simons et al. (1998) reported that individual motives for using cannabis accounted for 35% of the variance in cannabis use and 8% of the variance in cannabis use-related problems among first-year college students in the United States.

Until now, the general factor structure of the MMM has only been replicated in studies among samples that consisted mostly of college students (Chabrol, Ducongé, Casas, Roura, & Carey, 2005; Zvolensky et al., 2007). Like the original study of Simons et al. (1998), these samples were homogenous in terms of age, level of education and employment status. Moreover, the frequency of cannabis use in these samples was rather low. Therefore, the first aim of the current study was to replicate the factor structure and reliability of the MMM in a more heterogeneous sample of frequent cannabis users.

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Moreover, the MMM might not encapsulate all relevant motives for using cannabis. Motives unique to cannabis use may have been omitted in its adaptation from a drinking motives questionnaire (Lee, Neighbors, Hendershot, & Grossbard, 2009; Lee, Neighbors, & Woods, 2007). For example, sleep, boredom, relaxation and habit are reported as important reasons for cannabis use in several studies (Green, Kavanagh, & Young, 2003; Korf, Wouters, Benschop, & Van Ginkel, 2004; Lee et al., 2007, 2009; Schofield, 2006) and are not covered by the MMM. Our second aim was to determine whether these other motives for cannabis use constitute one or more additional motivational factors.

Finally, several studies using the MMM have found associations between specific motives and frequency of cannabis use and cannabis dependence (Bonn-Miller & Zvolensky, 2009; Bonn-Miller, Zvolensky, & Bernstein, 2007; Bonn-Miller, Zvolensky, Bernstein, & Stickle, 2008; Buckner, Bonn-Miller, Zvolensky, & Schmidt, 2007; Bujarski, Norberg, & Copeland, 2012; Chabrol et al., 2005; Fox, Towe, Stephens, Walker, & Roffman, 2011; Johnson, Mullin, Marshall, Bonn-Miller, & Zvolensky, 2010; Mitchell, Zvolensky, Marshall, Bonn-Miller, & Vujanovic, 2007; Simons, Correia, & Carey, 2000; Zvolensky et al., 2007). However, most of these studies were conducted in predominantly 'white' student populations and/or populations with relatively infrequent patterns of cannabis use. Therefore, the third aim of this study was to explore associations between motives for cannabis use and cannabis dependence in a heterogeneous population of frequent cannabis users.

2. Method

2.1. Participants and procedures

The data used in this study is derived from the baseline assessment of the CanDep study, a prospective cohort study on predictors of transitions in frequent cannabis use and dependence (Van der Pol et al., 2011). In brief, 600 frequent cannabis users (≥ 3 days per week for 12 months), aged 18 to 30 years, were recruited from 'coffee shops' (venues where the retail sales of small amounts of cannabis to adults is condoned) and through snowball sampling (i.e. respondents referring to new respondents), and interviewed face-to-face (Liebrechts et al., 2011). All participants provided written informed consent before participating in the study. The study was approved by the Medical Ethics Committee. One of the 600 respondents did not complete the MMM questionnaire and was therefore excluded from the current study, leaving 599 subjects for analysis.

2.2. Measures

Marijuana Motives Measure: The original MMM (Simons et al., 1998) is a 25 item questionnaire assessing five motives for using cannabis (Table 1). Each item has a five-point response option (1 almost never/never, 2 some of the time, 3 half of the time, 4 most of the time, and 5 almost always/always). The five motives are labelled: enhancement, coping, social, conformity and expansion. The MMM was converted to Dutch through forward and backward translation and pretesting. This process was monitored by the project group that designed and supervised this study. For the extended MMM, four items (sleep, boredom, relaxation and habit) were added to the original MMM (Table 1). The four added items emerged from a pilot study in which participants were asked an open-ended question about motives for cannabis use that were not covered in the MMM. Participants completed a paper-and-pencil version of the questionnaire during the interview.

The substance use disorder section of the Dutch Composite International Diagnostic Interview (CIDI 3.0, computer-assisted version) was used to establish 12-month DSM-IV diagnoses of cannabis dependence (De Graaf, Ten Have, & Van Dorsselaer, 2010; Kessler & Üstün, 2004).

Table 1

Rotated factor solutions of the original MMM (CFA) and extended MMM (EFA).

Items original MMM	Original MMM	Extended MMM
<i>Coping</i>		
1. To forget my worries	.84	–.84
4. Because it helps me when I feel depressed or nervous	.69	–.72
6. To cheer me up when I am in a bad mood	.60	–.62
17. To forget about my problems	.91	–.88
<i>Enhancement</i>		
7. Because I like the feeling	.74	.76
9. Because it's exciting	^a	^a
10. To get high	.47	.48
13. Because it gives me a pleasant feeling	.83	.79
18. Because it's fun	.56	.56
<i>Social</i>		
3. Because it helps me enjoy a party	.79	.77
5. To be sociable	.47	.52
11. Because it makes social gatherings more fun	.61	.61
14. Because it improves parties and celebrations	.84	.82
15. Because I feel more self-confident and sure of myself	.45	.42
16. To celebrate a special occasion with friends	^b	.51
<i>Conformity</i>		
2. Because my friends pressure me to use marijuana	^a	^a
8. So that others won't kid me about not using marijuana	^a	^a
12. To fit in with the group I like	.72	.72
19. To be liked	.75	.76
20. So I won't feel left out	.70	.69
<i>Expansion</i>		
21. To know myself better	.69	–.70
22. Because it helps me to more creative and original	.62	–.63
23. To understand things differently	.76	–.79
24. To expand my awareness	.79	–.78
25. To be more open to experiences	.80	–.78
<i>Added items extended MMM</i>		
<i>Routine</i>		
26. Out of boredom		–.87
27. Out of habit		–.59
28. To relax		^c
29. To sleep (better)		^c

^a Item removed from CFA/EFA because of poor factor loading (<0.4).

^b Item not included in Simons' 5-factor model (Simons et al., 1998).

^c Item removed from EFA because of crossloadings (>0.4).

2.3. Statistical analysis

The factor structure of the original MMM was evaluated through confirmatory factor analysis (CFA). To improve model fit, items with factor loadings below 0.4 were removed from the analysis (Stevens, 2002). Exploratory factor analysis (EFA) with principal axis extraction and oblique rotation was used to examine the structure of the extended MMM (25 original items plus 4 added items). Items with factor loadings below 0.4 and items crossloading above 0.4 on more than one dimension were removed from the solution (Stevens, 2002). The number of factors to be retained was determined by eigenvalues (>1) and screeplot (Cattell, 1966). Individual scale scores were constructed by computing the average item score within a factor for each participant. A small number of missing item scores (0.3%) were replaced by the individual within-factor mean. To explore associations between motives for cannabis use and cannabis dependence, scale scores for motives retained in the factor analysis were entered as independent variables in a multivariable logistic regression analysis with 12-month DSM-IV cannabis dependence as dependent variable. The first model included scale scores of the original MMM only; the second model (also) included scale scores of the extended MMM. The two models were compared

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