



# Motives for simultaneous alcohol and marijuana use among young adults



Megan E. Patrick<sup>a,\*</sup>, Anne M. Fairlie<sup>b</sup>, Christine M. Lee<sup>b</sup>

<sup>a</sup> Institute for Social Research, University of Michigan, USA

<sup>b</sup> Department of Psychiatry and Behavioral Sciences, University of Washington, USA

## HIGHLIGHTS

- There are distinct motives for simultaneous alcohol and marijuana (SAM) use.
- Motives for SAM use include conformity, positive effects, calm/coping, and social.
- After controlling for alcohol and marijuana motives, SAM motives were associated with use.

## ABSTRACT

The majority of young adults who use alcohol and marijuana sometimes use the two substances simultaneously. Understanding why young adults engage in simultaneous alcohol and marijuana (SAM) use may inform interventions and help offset negative consequences. To date, research has not yet examined motives for SAM use. The current study tested a 26-item measure of motives for SAM use in a community sample of young adults to identify the factor structure and to evaluate associations of subscales of SAM motives with alcohol and marijuana motives and substance use. Young adults from the Seattle metropolitan area ( $N = 286$ ; 58% female, 67% White/Caucasian) were asked about their motives for using alcohol, marijuana, and SAM as well as their use of alcohol and marijuana and related consequences in the past month. Exploratory factor analysis with promax rotation identified four factors to characterize motives for SAM use: (1) *conformity* (8 items,  $\alpha = 0.87$ , e.g., “to fit in with a group I like,” “pressure from others”), (2) *positive effects* (6 items,  $\alpha = 0.88$ , e.g., “cross-faded effects are better,” “to get a better high”) (3) *calm/coping* (3 items,  $\alpha = 0.77$ , e.g., “to calm me down,” “to cope with anxiety”), and (4) *social* (5 items,  $\alpha = 0.78$ , e.g., “because it is customary on special occasions,” “as a way to celebrate”). Results revealed that alcohol, marijuana, and SAM motives were moderately correlated. Even after controlling for alcohol or marijuana motives, SAM motives were associated with SAM use and marijuana use/consequences (but not alcohol use/consequences).

## 1. Introduction

Young adults exhibit peak lifetime levels of substance use; the majority of young adults (81%) used alcohol and about a third (34%) used marijuana in the past year (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2016). This pervasive use of alcohol and marijuana places young adults at particular risk for SAM use and consequences. The majority of people who use both alcohol and marijuana sometimes use them at the same time (Briere, Fallu, Descheneaxu, & Janosz, 2011; Subbaraman & Kerr, 2015), so that the health risks associated with alcohol (Hingson, Heeren, Winter, & Wechsler, 2005; Hingson, Heeren, & Zakocs, 2001; Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002; NIAAA, 2006; Yi, Williams, & Smothers, 2004) and marijuana (Volkow, Baler,

Compton, & Weiss, 2014) use overlap. Engaging in simultaneous alcohol and marijuana (SAM) use likely increases overall risks compared to using either alone (Briere et al., 2011). SAM users drink significantly more alcohol and have higher levels of alcohol-related consequences compared to alcohol only users (Subbaraman & Kerr, 2015). Documented consequences of SAM use include legal, interpersonal, physical, and mental health problems (Briere et al., 2011; Midanik, Tam, & Weisner, 2007; Pape, Rossow, & Storvoll, 2009). Of great public health concern are the risks of motor vehicle collisions, which occur at higher incidence among SAM users compared to alcohol-only or marijuana-only users (Ramaekers, Berghaus, van Laar, & Drummer, 2004; Sewell, Poling, & Sofuoglu, 2009; Terry-McElrath, O'Malley, & Johnston, 2014). There is debate about whether SAM use occurs incidentally because of the relatively high prevalence of alcohol and

\* Corresponding author at: Institute for Social Research, University of Michigan, 426 Thompson St., Ann Arbor, MI 48106-1248, USA.  
E-mail address: [meganpat@umich.edu](mailto:meganpat@umich.edu) (M.E. Patrick).

marijuana use, or whether it is intentional, based for instance on desired effects of simultaneous ingestion (Barnwell & Earleywine, 2006). Motives for substance use are proximal risk factors associated with extent of use. Distinct drinking motives are associated with problematic alcohol use and later consequences (i.e., coping motives) and with high levels of acute risk (i.e., enhancement motives; Cooper, 1994; Cooper, Frone, Russell, & Mudar, 1995; Cox & Klinger, 1988). Motives for marijuana use also distinguish levels of use and consequences (Lee, Neighbors, & Woods, 2007; Patrick, Schulenberg, O'Malley, Johnston, & Bachman, 2011; Simons, Correia, Carey, & Borsari, 1998; Simons, Gaher, Correia, Hansen, & Christopher, 2005). Motive–use associations and endorsement of motives may distinguish those who use both alcohol and marijuana (Simons et al., 2005), and users of both substances can discriminate between alcohol and marijuana motives (Simons et al., 1998; Simons, Correia, & Carey, 2000). SAM use may be partly based on motivations to achieve unique effects (e.g., to increase effect of one substance by using both substances together), but these motives for SAM use have not yet been examined.

Previous research has shown that more frequent SAM use is related to greater use of alcohol or marijuana to increase the effects of other drugs (Terry-McElrath, O'Malley, & Johnston, 2013). Expectancies for SAM use have shown added predictive power of use beyond separate alcohol and marijuana expectancies (Barnwell & Earleywine, 2006). To date, research has yet to examine why young adults engage in SAM use, despite the fact that SAM use is common and associated with increased negative consequences.

## 2. The current study

Research Questions for the current study were: (1) What is the factor structure of the measure of motivations for SAM use?, (2) How do the SAM motives subscales relate to motives for alcohol use and motives for marijuana use?, and (3) Are SAM motives associated with SAM, alcohol, and marijuana use and their consequences, above and beyond motives for alcohol or marijuana use?

## 3. Method

### 3.1. Sample

A community sample of 779 young adults (ages 18–23 at time of recruitment) living in the greater Seattle metropolitan area participated in a longitudinal study for 24 consecutive months. Recruitment occurred from January 2015 to January 2016. Data for the present manuscript are from surveys completed in May 2016 and range from month 4 to month 15 in the 24-month sequence. The subsample completing the May 2016 survey ( $N = 676$ ) had a mean age of 21.35 years ( $SD = 1.83$ ); was 59.50% female; 76.11% heterosexual; 59.19% White/Caucasian, 18.83% Asian American, and 21.98% other race. All procedures were approved by the local University Institutional Review Board and a federal Certificate of Confidentiality was obtained.

### 3.2. Procedures

Recruitment procedures included advertising (e.g., social networking sites), posting flyers, and conducting community outreach. An online survey determined eligibility (i.e., age 18–23, residence within 60 miles of the project office, valid email address, past-year alcohol use, and willingness to come to local study office), followed by a 1½-hour in-person appointment including age verification (via driver's license or picture ID), consent for longitudinal study, and an online baseline assessment. In total, 779 young adults completed the baseline assessment and were considered enrolled in the longitudinal study.

Each month participants received a series of reminders (e.g., email) to complete the survey between the 1st and 10th of the month. In addition to a core set of monthly measures, periodic measures varied

across months to maintain engagement. Of the 779 original participants, 778 began the monthly surveys.

The present analyses use data collected in May 2016 with a response rate of 84.45% ( $N = 657$ ). Just under half ( $n = 311$ , or 47.34%) reported simultaneous alcohol and marijuana use at least once in their lifetime. Complete data on the SAM motives items (for inclusion in the factor analysis) were available for 286 participants (92.0% of those who reported lifetime SAM use and were eligible to answer these questions).

### 3.3. Measures

Demographics were assessed at baseline and included age (coded as 18–20 = 0; 21 and older = 1); biological sex (0 = Female, 1 = Male); sexual identity status (coded as 0 = did not identify as heterosexual, 1 = identified as heterosexual); student status (0 = not a student, 1 = 4-year college, 2-year college, or graduate student), highest parental education (coded as 0 = less than a Bachelor's degree, 1 = bachelor's degree or higher). Race was coded using two dummy codes comparing participants who identified as “Asian or South Asian” and those who indicated any other race to the reference group “Caucasian or White.”

**Alcohol use motives** were assessed with the 28-item Drinking Motives Questionnaire – Revised (DMQ-R, Grant, Stewart, O'Connor, Backwell, & Conrod, 2007). The DMQ-R assesses the extent to which the individual uses alcohol for four different types of reasons (social [5 items,  $\alpha = 0.75$ ], enhancement [5 items,  $\alpha = 0.82$ ], coping [13 items,  $\alpha = 0.92$ ], and conformity [5 items,  $\alpha = 0.79$ ] reasons), using a response scale from 1 = “Almost never/never” to 5 = “Almost always/always.”

**Marijuana use motives** were assessed with the 36-item Comprehensive Marijuana Motives Questionnaire (CMMQ, Lee, Neighbors, Hendershot, & Grossbard, 2009). The CMMQ assesses the extent to which the individual uses marijuana for twelve different reasons, with three items each (enjoyment [ $\alpha = 0.82$ ], conformity [ $\alpha = 0.53$ ], coping [ $\alpha = 0.76$ ], experimentation [ $\alpha = 0.80$ ], boredom [ $\alpha = 0.82$ ], alcohol-related [ $\alpha = 0.81$ ], celebration [ $\alpha = 0.84$ ], altered perception [ $\alpha = 0.92$ ], social anxiety [ $\alpha = 0.86$ ], low risk [ $\alpha = 0.83$ ], sleep [ $\alpha = 0.86$ ], and availability [ $\alpha = 0.78$ ], using a scale of 1 = “Almost never/never” to 5 = “Almost always/always.”

**Simultaneous alcohol and marijuana use motives** were assessed with a new measure developed based on review of the literature of alcohol and marijuana use motives, review of the perceived effects of SAM use, and qualitative data collected in the screening survey. For the open-ended screening data, the first and last author independently reviewed the open-ended responses. Young adults listed up to five reasons they “use alcohol and marijuana together, that is, so their effects overlapped.” The two authors each came up with a preliminary list of motivations and examples within each motivation and then discussed their lists to reach consensus. Combined, broad motivation topics included conformity/peer pressure, better effects when combined, increasing creative/altered state, coping reasons, social/party facilitation, and because of boredom.

To develop a preliminary measure, the three authors of this manuscript then identified items matching each broad motivation category based on qualitative responses or previously published alcohol and marijuana use motives (e.g., Grant et al., 2007; Lee et al., 2009). The measure assessed the broad categories identified in our review of the open-ended responses and included 26 items with response options from 1 = “Almost never/never” to 5 = “Almost always/always.” Participants were asked “Thinking about when you typically use alcohol and marijuana at the same time, that is so their effects overlap, how often would you say you use them at the same time for each of the following reasons?” The present manuscript describes the psychometric analysis of this measure of motivations for SAM use.

**Simultaneous alcohol and marijuana (SAM) use** was assessed with a single item asking, “How many of the times when you used

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