Short communication

Differences in reporting of perceived acute effects of alcohol use, marijuana use, and simultaneous alcohol and marijuana use

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ABSTRACT

Background: Although there are serious negative harms associated with simultaneous alcohol and marijuana (SAM) use, little is known about the self-reported acute effects of SAM use and how they may be similar to or different than effects experienced when using alcohol or marijuana only. The current study examines the perceived acute effects of SAM use, compared to using alcohol or marijuana only, as well as demographic and substance use predictors of overall SAM effects.

Methods: Participants were a community sample of young adults ages 18–23 participating in a longitudinal study on social role transitions and substance use during young adulthood. Young adults who reported SAM use at least once in their lifetime were selected for the present analyses (N = 315; mean age = 21.42; 58% female) and reported the effects they experienced from typical alcohol use, marijuana use, and SAM use.

Results: There were significant differences in the extent to which young adults perceived the effects depending on the substances used. Most effects (i.e., clumsy, confused, dizzy, difficulty concentrating) were rated strongest when engaging in SAM use, compared to typical alcohol or marijuana use alone. Feeling high and feeling marijuana effects were rated strongest when engaging in marijuana use alone compared to SAM use, but feeling drunk was greater during SAM use compared to alcohol use alone. Greater alcohol use and increased time spent high during typical SAM use were associated with greater overall SAM effects.

Conclusions: When young adults engage in SAM use they report experiencing greater negative physiological and cognitive effects.

1. Introduction

Alcohol and marijuana use are common among young adults in the US: in the past year 82% have used alcohol and 32% have used marijuana (Johnston et al., 2016). The majority of people who use both alcohol and marijuana sometimes do so simultaneously, so that their effects overlap (Brière et al., 2011; Subbaraman and Kerr, 2015). Based on a large population survey of U.S. adults, 15% of young adults aged 18–29 engaged in simultaneous alcohol and marijuana (SAM) use (Subbaraman and Kerr, 2015).

Documented consequences of SAM use include substance-related legal, academic, interpersonal, physical, and mental health problems (Brière et al., 2011; Midanik et al., 2007; Pape et al., 2009). The majority of research on SAM use consequences has focused on the significant outcome of impaired driving. Results indicate the incidence of traffic collisions is higher among those reporting SAM use than alcohol or marijuana use alone (Ramaekers et al., 2004; Sewell et al., 2009; Terry-McElrath et al., 2014). Comparisons of perceptions of acute

consequences of alcohol, marijuana, and SAM use are needed to understand how young adults view the results of their substance use and to inform prevention and intervention efforts regarding simultaneous ingestion.

The purpose of the present study is to examine perceived acute effects of using alcohol and marijuana simultaneously, compared to effects when typically using alcohol or marijuana alone, among young adults. Further, we examine the potential interaction effects of alcohol and marijuana use on overall SAM effects.

2. Method

2.1. Participants

Participants were a subsample of young adults from *Project Transitions* (N = 779, ages 18–23 at recruitment), a longitudinal study including 24 online monthly assessments to examine social role transitions and substance use during young adulthood. The present analyses

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utilize data collected in May 2016, regardless of which monthly survey the participant was given (i.e., participants were on Months 4–15). In May 2016, the overall response rate was 86.8% (N = 676). Those who reported SAM use at least once in their lifetime were selected for the present analyses (46.6%, N = 315, mean age of 21.42 [SD = 1.87], 58.4% female, 78.1% Caucasian, 74.3% heterosexual, 56.2% were students at a 4-year or 2-year post-secondary institution). All procedures were approved by the local University Institutional Review Board and a federal Certificate of Confidentiality was obtained.

2.2. Procedures

Recruitment included mainly online and print advertisements, directing interested participants to a website (or phone number) for more information and to complete a brief online eligibility survey. Eligible participants were 18–23 years old, resided within the greater Seattle metropolitan area, had a valid email address, drank alcohol at least once in the last year, and were willing to come to the study office for an initial baseline assessment (N = 779).

2.3. Measures

2.3.1. Lifetime SAM use

SAM use was assessed with the item, "On how many occasions (if any) in your lifetime have you used alcohol and marijuana at the same time, that is, so their effects overlapped?" with responses ranging but coded as 0 = none and 1 = at least once.

2.3.2. Perceived effects of alcohol use, marijuana use, and SAM use

Regarding alcohol effects, participants were asked to complete the Subjective High Assessment Scale (Eng et al., 2005) which included 7 items from the larger SHAS (Schuckit et al., 1997a,b) that have the greatest sensitivity to the effects of alcohol and cluster together (Schuckit et al., 2000). Instructions include, "The following words describe feelings that are sometimes produced by drinking alcohol. Please rate the extent to which you feel each of the following when you typically use alcohol." Participants rated the extent to which they felt three general effects (i.e., feeling alcohol effects, drunk, high) and four more specific effects of alcohol (i.e., clumsy, confused, dizzy, difficulty concentrating, from 0 = not at all to 4 = extremely).

The SHAS-7 was modified to ask the same items in relation to marijuana use and to SAM use due to many of the SHAS effects being relevant for marijuana use. For when participants "typically use marijuana," they rated the extent to which they felt two general effects (i.e., feeling marijuana effects, high) and four specific effects (i.e., clumsy, confused, dizzy, difficulty concentrating). For when participants "typically use alcohol and marijuana at the same time - that is so their effects overlap," they rated the extent to which they felt four general effects (i.e., feeling alcohol effects, feeling marijuana effects, drunk, high) and four specific effects (i.e., clumsy, confused, dizzy, difficulty concentrating). All responses were from 0 = not at all to 4 = extremely. The mean of the 8 SAM effects item was used to create an "average SAM effects" item.

2.3.3. Alcohol use on typical drinking and SAM occasions

Alcohol use on typical occasions was assessed with, "When you drink alcohol, how many drinks in total do you typically have?" *Alcohol use on typical SAM occasions* was assessed with, "These next questions are about your typical use of alcohol and marijuana at the same time, that is, so that their effects overlap...How many drinks in total do you have?" Response options for both questions were 1 = 1 drink to 25 = 25 or more drinks.

2.3.4. Marijuana use on typical marijuana and SAM occasions

Marijuana use on typical occasions was assessed with, "Thinking about when you typically use marijuana, how long are you high?"

Marijuana use on typical SAM occasions was assessed with, "These next questions are about your typical use of alcohol and marijuana at the same time, that is, so that their effects overlap... How long are you high in total?" Response options were 0 = 0 hours to 12 = 12 or more hours.

2.4. Analytic plan

To address the first aim of the study, within-person repeated measures ANOVA models examined mean differences in perceived effects for typical alcohol use, typical marijuana use, and typical SAM use. For models with two comparisons (e.g., drunk effect for alcohol use only compared to SAM use), paired samples t tests were used to examine differences. To address the second aim, hierarchical multiple regression analyses examined predictors of the average SAM effects (Step 1: sex, student status, ethnicity, and age), and evaluated the extent to which levels of alcohol and marijuana use (Step 2: number of drinks consumed and hours high on typical SAM occasions) and their interaction (Step 3) were associated with SAM effects. Drinks and hours high were mean centered to reduce collinearity and aid in interpretation. Results of the final model (Step 3) are presented.

3. Results

On average, participants reported typically drinking nearly four drinks (M = 3.86, SD = 2.73) and being high about three hours (M = 2.97, SD = 1.85). There were no significant differences when comparing typical alcohol only and marijuana only occasions to typical SAM occasions for alcohol (M = 4.01, SD = 2.41; t(244) = −1.038, p = 0.300) nor for marijuana (M = 2.92, SD = 1.67; t(198) = −1.361, p = 0.175). Nearly half of the sample used SAM at least ten or more times in their lifetime (48.6%), with 21.9% using 1–2, 19.0% using 2–5, and 10.5% using 6–9 occasions.

Table 1 provides mean differences of perceived effects of typical alcohol use, typical marijuana use, and typical SAM use. For each effect, with the exception of "feeling alcohol effects," there was a significant difference in the extent to which participants felt the effect depending on the typical substance(s) used. The majority of effects (i.e., clumsy, confused, dizzy, difficulty concentrating) were rated strongest during SAM use, compared to alcohol or marijuana use alone. The effects of "high" and "feeling marijuana effects" were weaker during SAM use compared to marijuana use alone, although the effect of "drunk" was greater during SAM use compared to alcohol use alone. Table 2 summarizes regression results of the final model for the average SAM effects.

Being female, greater alcohol use during typical SAM use, and greater time spent high during typical SAM use were associated with more overall SAM effects. There was a significant interaction between drinks and hours high. Examination of simple slopes (Fig. 1) indicated that for people who spent less time high, greater alcohol use was associated with increased overall SAM effects (β = 0.122, p < 0.001). For those who spent more time high, alcohol use was not associated with overall SAM effects (β = 0.041, p > 0.05).

4. Discussion

While epidemiological evidence suggests there are serious negative harms associated with SAM use, including greater rates of drunk driving (Brière et al., 2011; Subbaraman and Kerr, 2015; Terry-McElrath et al., 2014), behavioral research had not yet examined self-reported acute effects of SAM use and how they may be similar to or different than effects experienced when typically using alcohol or marijuana alone. The present study aimed to extend our knowledge of these SAM effects. There has been some research to suggest that young adults engage in SAM use for different reasons including to increase intoxication (e.g., cross-faded effects) or to reduce the negative effects of alcohol (e.g.,