

College Cannabis Use: The Unique Roles of Social Norms, Motives, and Expectancies

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ABSTRACT. Objective: Given that the majority of college cannabis use occurs in social situations, descriptive norms (beliefs about others' use) and injunctive norms (others' approval of risky use) may be particularly relevant to cannabis-related behaviors. Yet, little research has examined the unique impact of these norms on one's own behaviors when accounting for the variance attributable to other relevant cognitive factors. The current study is the first known investigation of the unique impact of social norms, cannabis use motives, and cannabis effect expectancies on cannabis use. **Method:** Data came from 223 (64.1% female) current cannabis-using undergraduates who completed an online questionnaire in exchange for psychology-course research credit. **Results:** Descriptive norms regarding friends (not students in general) and injunctive

norms (friends and parents) were related to cannabis use frequency. Descriptive norms (friends, not students in general) and injunctive norms (friends, not parents) were related to cannabis problems. Relevant norms, expectancies, and motives accounted for 66.8% of the variance in cannabis use frequency and 28.7% of the variance in cannabis problems. In multivariate analyses, descriptive norms (friends) accounted for the greatest amount of unique variance in cannabis use frequency, whereas coping motives accounted for the greatest amount of unique variance in cannabis-related problems. **Conclusions:** Descriptive norms (friends) and coping motives may be two cognitive vulnerability factors that could be particularly important targets for interventions. (*J. Stud. Alcohol Drugs*, 74, 720–726, 2013)

COLLEGE SUBSTANCE USE is strongly influenced by beliefs about others' substance use (i.e., descriptive norms) and others' approval of substance use (i.e., injunctive norms) (for review, see Borsari and Carey, 2001). Although most of this research has concerned alcohol, descriptive and injunctive norms do seem to play important roles in cannabis use. Regarding descriptive norms, cannabis users believe a greater percentage of other students also use cannabis (Wolfson, 2000). College students who believed typical students used cannabis in the past month were three times more likely to have used cannabis themselves in the past month than were students who believed typical students did not use it (Arbour-Nicitopoulos et al., 2010). Descriptive norms are related to more frequent use (Grossbard et al., 2009; Kilmer et al., 2006; Neighbors et al., 2008a; White et al., 2006a) and to more cannabis-related problems (Kilmer et al., 2006; Neighbors et al., 2008a). Regarding injunctive norms, believing that friends approve of cannabis use is related to more frequent self-use and cannabis-related problems (Neighbors et al., 2008a). In the only known examination of the unique impact of social norms on cannabis use behaviors, descrip-

tive and injunctive norms regarding friends, but not social expectancies, remained significantly related to the frequency of cannabis use in multivariate analyses (Neighbors et al., 2008a). Notably, descriptive norms are prospectively related to increases in cannabis use (White et al., 2006a), suggesting a potential causal relationship.

The strength of the relationship between social norms and cannabis use appears to vary as a function of the reference group. Cannabis use was positively correlated with injunctive norms regarding close friends and parents but not students in general (LaBrie et al., 2010). Further, among regular cannabis users (i.e., used cannabis ≥ 20 times in the past year), injunctive norms regarding close friends were significantly greater than for students in general or parents (LaBrie et al., 2011). It appears that descriptive norms regarding friends were more strongly related to the frequency of self-use and use-related consequences than descriptive norms regarding students in general (Kilmer et al., 2006), although reference groups were not directly compared in that study.

There remain several gaps in our understanding of the impact of social norms on cannabis use behaviors that the current study sought to elucidate. First, direct comparisons between reference groups regarding descriptive norms have not been conducted. Given that college students tend to grossly overestimate the prevalence of cannabis use among other college students (Kilmer et al., 2006; Perkins et al., 1999), elucidating beliefs about which groups of people most influence students' cannabis use behaviors could have important implications for prevention and treatment efforts. The current study tested whether normative beliefs regarding more proximal reference groups (e.g., friends) were

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more strongly related to cannabis use behaviors than beliefs regarding more distal groups (e.g., students in general, parents).

Second, the relative strength of social norms in the prediction of cannabis use has received little attention. As stated above, prior work (Neighbors et al., 2008a) found descriptive and injunctive norms regarding friends to be stronger predictors of cannabis use than social expectancies. This work was extended in the current study by testing whether social norms remained significantly related to cannabis use frequency and cannabis-related problems after accounting for the variance attributable to both positive and negative cannabis-effect outcome expectancies as well as cannabis use motives, cognitive factors related to cannabis use behaviors (Lee et al., 2007; Schafer and Brown, 1991; Simons et al., 1998). Prior work was also extended by examining the unique contribution of descriptive and injunctive norms by reference group. Given that normative beliefs are malleable in brief interventions and changes in normative beliefs lead to better outcomes (Carey et al., 2010; Terlecki et al., 2012), identifying the relative contribution of known cognitive predictors of cannabis use could provide important information that could guide treatment and prevention efforts.

Method

Participant selection and procedures

Participants were recruited through the psychology undergraduate participant pool as part of a study on cognitive factors related to cannabis use (Buckner et al., 2013). The study was approved by the university's institutional review board, and informed consent was obtained before data collection. Participants completed an online survey via survey-monkey.com and received research credit for completion of the survey.

Although 969 participants began the survey, 4.4% were deemed ineligible because they were outside the target age range of 18–24 years ($n = 22$), had incomplete responses ($n = 15$), or had questionable validity ($n = 4$; detailed below). In line with the time frame of the measure used to assess cannabis-related problems (described below), the current study included the 24.8% of the remaining 926 who endorsed current (i.e., past-3-month) cannabis use. An additional seven participants were identified as outliers and were excluded from analyses for scoring more than 3 *SD* from the mean on variables of interest (specifically, on the measure of cannabis-related problems [$n = 3$], injunctive norms regarding parents [$n = 3$], or both [$n = 1$]). The final sample ($n = 223$) was predominantly female (64.1%) and non-Hispanic/Latino (92.4%), with 57.0% working part or full time. The racial composition was 5.8% African American, 2.7% Asian American, 85.7% White, 4.5% mixed, and 1.3% other. Ages ranged from 18 to 23 years ($M = 19.70$, $SD = 1.35$), and

class standings were 25.6% first year, 30.5% second year, 19.7% third year, 23.8% fourth year, and 0.4% other. Nearly half (43.5%) endorsed frequent (weekly) cannabis use, and 17.0% endorsed daily use.

Measures

Descriptive norms and self-use. Consistent with the Core Institute's Campus Assessment of Alcohol and Other Drug Norms and prior work on social norms (Buckner et al., 2010; Perkins et al., 1999), participants were asked to indicate how often they, their friends, and students in general typically use cannabis. Response options were as follows: 8 (*daily*), 7 (*nearly every day*), 6 (*two to three times per week*), 5 (*one time per week*), 4 (*two to three times per month*), 3 (*one time per month*), 2 (*three to six times per year*), 1 (*one to two times per year*), and 0 (*never*).

Injunctive norms. Modified from a measure of injunctive norms of alcohol (Baer, 1994), perception of friends' and parents' approval of risky cannabis use behaviors was assessed by asking how friends/parents would respond if they knew the participant (a) used cannabis every weekend, (b) used cannabis daily, (c) drove after using cannabis, and (d) used enough cannabis to pass out. Each item was rated from 1 (*strong disapproval*) to 7 (*strong approval*). Responses were summed; thus, higher scores reflect greater approval of risky cannabis use. The friend and parent scales demonstrated adequate internal consistency in our sample ($\alpha = .87$, $\alpha = .92$, respectively).

Other cognitive risk factors. Expectations regarding cannabis use were assessed with the Marijuana Effect Expectancy Questionnaire (MEEQ; Aarons et al., 2001; Schafer and Brown, 1991). In the present sample, the higher order MEEQ scales demonstrated adequate internal consistency: positive expectancies ($\alpha = .86$) and negative expectancies ($\alpha = .86$). Cannabis use motives were assessed with the Marijuana Motives Measure (Simons et al., 1998), a 25-item measure assessing on a 1 (*almost never/never*) to 5 (*almost always/always*) scale the degree to which participants smoked cannabis for particular reasons. Subscales have demonstrated adequate internal consistency in prior work (Chabrol et al., 2005) and in the present sample: conformity ($\alpha = .81$), enhancement ($\alpha = .90$), social ($\alpha = .87$), coping ($\alpha = .87$), and expansion ($\alpha = .91$).

Cannabis problems were assessed with the Marijuana Problems Scale (Stephens et al., 2000), a 19-item list of negative consequences related to cannabis use in the past 90 days. Endorsed items were summed to create an index of the total number of cannabis-related problems. This measure has demonstrated adequate internal consistency in prior work (Buckner et al., 2010; Stephens et al., 2000) and in the present sample ($\alpha = .76$).

Infrequency Scale. To identify responders who provided random or grossly invalid responses, we included four ques-

TABLE 1. Means, standard deviations, and correlations among study variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. No. of cannabis problems	–												
2. Cannabis use frequency	.42*	–											
3. Descriptive norms (friends)	.33*	.66*	–										
4. Descriptive norms (students)	.00	.17	.35*	–									
5. Injunctive norms (friends)	.26*	.61*	.60*	.21*	–								
6. Injunctive norms (parents)	.13	.35*	.23*	.05	.35*	–							
7. Positive expectancies	.23*	.37*	.20*	-.05	.24*	.18	–						
8. Negative expectancies	.19	-.35*	-.31*	-.10	-.30*	-.15	.07	–					
9. Social motives	.23*	.43*	.33*	.09	.42*	.27*	.49*	-.08	–				
10. Coping motives	.46*	.50*	.33*	.04	.34*	.22*	.51*	.00	.52*	–			
11. Enhancement motives	.20*	.61*	.40*	.03	.49*	.24*	.46*	-.31*	.65*	.43*	–		
12. Conformity motives	.02	-.14	-.06	.09	-.07	-.07	.01	.16	.24*	.18	-.09	–	
13. Expansion motives	.22*	.46*	.33*	.06	.31*	.23*	.42*	-.18	.46*	.58*	.43*	.13	–
<i>M</i>	3.2	4.1	5.2	4.6	12.9	5.4	82.2	50.2	11.2	8.7	17.0	6.6	9.4
<i>(SD)</i>	(2.9)	(2.3)	(2.0)	(1.6)	(4.9)	(2.9)	(14.8)	(11.9)	(4.7)	(4.2)	(5.9)	(2.9)	(4.8)

Note: No. = number.

* $p < .003$.

tions from the Infrequency Scale (Chapman and Chapman, 1983). As in similar studies (Buckner et al., 2010; Cohen et al., 2009), those who endorsed three or more infrequency items were excluded ($n = 4$).

Results

Correlations among study variables

Bivariate correlations among study variables are presented in Table 1. Bonferroni corrections ($.05 / 13 = .003$) were applied. The frequency of cannabis use was significantly positively correlated with descriptive norms (friends, but not students); injunctive norms (friends and parents); positive expectancies; and social, coping, enhancement, and expansion motives. Frequency was negatively correlated with negative expectancies. The number of cannabis-related problems was significantly positively correlated with cannabis use frequency; descriptive norms (friends, but not students in general); injunctive norms (friends, not parents); positive expectancies; and social, coping, enhancement, and expansion motives.

Reference group

Figure 1 illustrates the estimated marginal means and standard errors for students' own use and their descriptive norms regarding friends and students in general presented separately by cannabis use frequency (weekly vs. less than weekly). To test the within- and between-subjects effects of cannabis use frequency and reference group on social norms, mixed-model analyses of variance (ANOVAs) were conducted separately for descriptive and injunctive norms. Regarding descriptive norms, there was a significant main effect for reference group, $F(1, 220) = 31.86, p < .001$, and cannabis use frequency, $F(1, 220) = 41.73, p < .001$. The 2

(weekly vs. infrequent) \times 2 (friends vs. students) interaction was significant, $F(1, 220) = 51.02, p < .001$. Follow-up contrasts indicate that compared with infrequent users, weekly users endorsed significantly greater descriptive norms regarding friends, $F(1, 220) = 85.06, p < .001, d = 1.25$, but not students in general, $F(1, 220) = 1.66, p = .199, d = 0.17$. Inspection of Figure 1 suggests that although infrequent users rated friend and student use similarly, weekly users reported that their friends used more frequently than did students in general.

To examine students' perception of their own use compared with peers' use, difference scores were created in

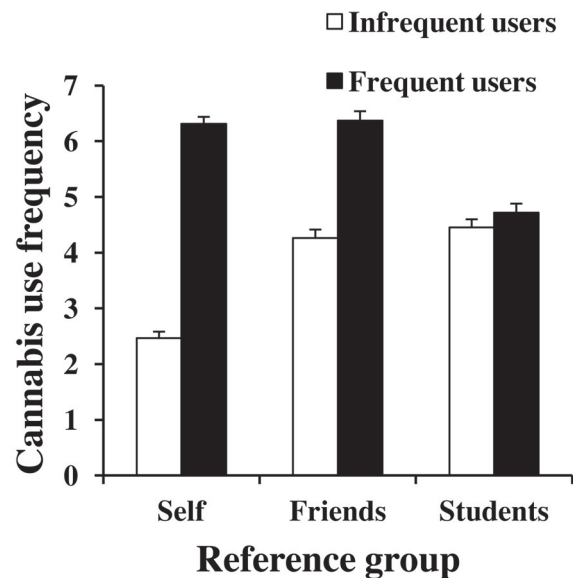


FIGURE 1. Means and standard errors for students' own cannabis use and descriptive norms by frequency of self-use. Compared with infrequent users, weekly users endorsed significantly greater descriptive norms regarding friends, $F(1, 220) = 85.06, p < .001, d = 1.25$, but not students in general, $F(1, 220) = 1.66, p = .199, d = 0.17$.

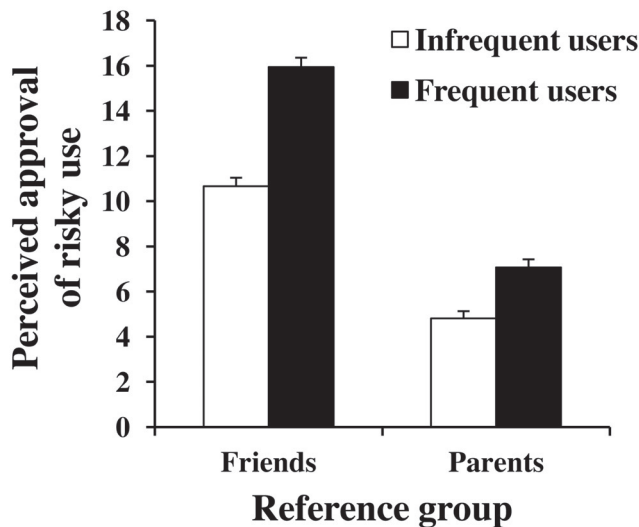


FIGURE 2. Means and standard errors for injunctive norms by frequency of self-use. Compared with infrequent users, weekly users endorsed significantly more positive injunctive norms regarding friends, $F(1, 220) = 84.23, p < .001, d = 1.25$, and parents, $F(1, 220) = 18.98, p < .001, d = 0.59$.

which the marijuana use by friends or students in general was subtracted from students' own use. Two one-way ANOVA models compared weekly versus infrequent users on these difference scores. The model was significant for both descriptive norms regarding friends, $F(1, 222) = 73.07, p < .001, d = 1.16$, and students in general, $F(1, 222) = 31.86, p < .001, d = 1.94$. Although infrequent users perceived their own use to be less than their friends' use, weekly users perceived their own use to be comparable to that of their friends. Infrequent users perceived their own use to be less than that of students in general, whereas weekly users perceived their own use to be greater than that of students in general.

Regarding injunctive norms, there was a significant main effect for reference group, $F(1, 220) = 661.82, p < .001$, and cannabis use, $F(1, 220) = 82.00, p < .001$. The 2 (infrequent vs. weekly) \times 2 (friends vs. parents) interaction was significant, $F(1, 220) = 35.04, p < .001$ (Figure 2). Follow-up contrasts indicate that compared with infrequent users, weekly

users endorsed significantly more positive injunctive norms regarding friends, $F(1, 220) = 84.23, p < .001, d = 1.25$, and parents, $F(1, 220) = 18.98, p < .001, d = 0.59$. Inspection of Figure 2 indicates that although both groups perceived their friends to be more approving of risky use than parents, the difference between friend and parental approval was particularly pronounced for weekly users.

Unique predictors

Variables that were significantly correlated with cannabis use frequency were simultaneously entered into a regression model in which cannabis use frequency was the dependent variable (Table 2). To address multicollinearity, variables were standardized. The overall model was significant, $F(10, 211) = 42.47, p < .001$. Together, the independent variables accounted for 66.8% of the variance in cannabis use frequency. Descriptive norms (friends), injunctive norms (friends, parents), and coping and enhancement motives remained significantly, positively related to cannabis use frequency. Negative expectancies and social motives were negatively related to use. Descriptive norms (friends) accounted for the greatest percentage of unique variance in cannabis use frequency, followed by enhancement motives, injunctive norms (friends), and coping motives.

Standardized versions of the variables that were significantly correlated with cannabis-related problems were simultaneously entered into a regression model in which the number of cannabis-related problems was the dependent variable (Table 3). The overall model was significant, $F(9, 212) = 9.49, p < .001$. Together, the independent variables accounted for 28.7% of the variance in cannabis-related problems. Frequency of self-use and coping motives remained significantly related to cannabis-related problems. Coping motives accounted for the greatest amount of unique variance, followed by self-use.

Discussion

These findings contribute to our understanding of the impact of cognitive factors on cannabis-related behaviors in

TABLE 2. Linear regression model predicting frequency of cannabis use

Variable	<i>B</i>	β	<i>t</i>	<i>p</i>	<i>sr</i> ²
Sex ^a	-0.31	-.06	-1.51	.133	.00
Descriptive norms (friends)	0.77	.34	6.46	.000	.07
Injunctive norms (friends)	0.40	.17	3.14	.002	.02
Injunctive norms (parents)	0.26	.09	2.03	.043	.01
Positive expectancies	0.11	.05	0.97	.335	.00
Negative expectancies	-0.22	-.10	-2.10	.037	.01
Social motives	-0.27	-.12	-2.03	.044	.01
Coping motives	0.44	.19	3.44	.001	.02
Enhancement motives	0.63	.27	4.57	.000	.03
Expansion motives	0.12	.05	0.98	.327	.00

^aSex was dummy coded such that 0 = male and 1 = female.

TABLE 3. Linear regression model predicting number of cannabis-related problems

Variable	<i>B</i>	β	<i>t</i>	<i>p</i>	<i>sr</i> ²
Sex ^a	-0.41	-.07	-1.10	.272	.00
Frequency of self-cannabis use	0.79	.27	2.74	.007	.03
Descriptive norms (friends)	0.32	.11	1.33	.183	.01
Injunctive norms (friends)	-0.07	-.03	-0.31	.756	.00
Positive expectancies	0.04	.01	0.18	.861	.00
Social motives	0.04	.01	0.16	.875	.00
Coping motives	1.15	.39	4.83	<.001	.08
Enhancement motives	-0.40	-.14	-1.54	.125	.01
Expansion motives	-0.37	-.13	-1.68	.094	.01

^aSex was dummy coded such that 0 = male and 1 = female.

several ways. First, this is the first known study of the relative impact of social norms, cannabis use motives, and cannabis effect expectancies on college cannabis use behaviors. Second, this study is the first to directly test the impact of reference group on the relationships of both descriptive and injunctive norms to cannabis-related behaviors, determining that cognitions regarding more salient groups (normative beliefs about friends) appear to play especially important roles in the frequency of cannabis use, whereas coping motives appear to be especially important in use-related problems.

Although prior work (Neighbors et al., 2008a) found descriptive and injunctive norms regarding friends to be stronger predictors of cannabis use than social expectancies, this is the first known study to determine that social norms are among the best predictors of illicit substance use (in this case, cannabis) after accounting for variance attributable to both positive and negative expectancies as well as other cognitive vulnerability factors related to substance-related behaviors (i.e., motives). Consistent with the college drinking literature (Neighbors et al., 2007), descriptive and injunctive norms (friends) were among the strongest predictors of the frequency of self-use in the current study. Notably, descriptive norms (friends) were the strongest predictor of the frequency of one's own cannabis use, and injunctive norms (friends) were as strong a predictor as coping motives.

Although descriptive and injunctive norms regarding friends were robustly related to more frequent cannabis use, they were not robustly related to cannabis-related problems in multivariate analyses. Rather, coping motives were the strongest predictor of cannabis-related problems. This finding is consistent with a growing body of work suggesting that young adults with chronically elevated negative affect appear especially vulnerable to cannabis-related impairment (Buckner and Schmidt, 2008; Buckner et al., 2012), particularly if they use cannabis as a means to manage that negative affect (Buckner et al., 2007; Johnson et al., 2010).

Some findings suggest that the relations of social norms to cannabis-related behaviors may be somewhat different from the relations of social norms to drinking behaviors. Injunctive norms (friends) were unique predictors of alcohol-related problems (Neighbors et al., 2007). Yet, injunctive norms were not uniquely related to cannabis problems, sug-

gesting that those experiencing cannabis-related problems do not simply engage in risky use (e.g., driving under the influence) because they believe their friends or parents approve of such behaviors. To better understand the role of injunctive norms on cannabis use behaviors, future work could benefit from assessing whether injunctive norms regarding a wider range of cannabis-related behaviors (e.g., approval of missing class to smoke, of attending class after using, or of neglecting homework or other responsibilities to use) are related to experiencing cannabis problems.

A second difference is that although drinking frequency mediated the relationships of alcohol-related problems to motives (Neighbors et al., 2007), coping motives remained significantly related to cannabis-related problems after accounting for the variance attributable to cannabis use frequency. This finding suggests that students who use cannabis as a means to manage negative affect may not experience more cannabis-related problems simply because they tend to use cannabis more frequently. Rather, something about the ways in which they use cannabis may place them at greater risk for problems. Perhaps they do not use cannabis more frequently but use in greater quantities when they do use. Alternatively, perhaps they are more likely to use in high-risk situations (e.g., while driving) or in ways that cause functional impairment (e.g., using before class or doing homework instead of waiting until afterward). Future work will be necessary to identify what use-related behaviors place these individuals at risk for problems.

Another contribution of the current study is that it is the first to directly test the impact of reference group on the relationships of both descriptive and injunctive norms to cannabis-related behaviors. The present study replicated prior work finding that the frequency of cannabis use was positively correlated with injunctive norms (friends and parents) (LaBrie et al., 2010) and that more frequent users endorsed more positive injunctive norms regarding friends than parents (LaBrie et al., 2011). Prior work was extended by determining that descriptive norms regarding friends (but not students in general) were related to the frequency of cannabis use. Taken together, these findings support the contention that social norms regarding more proximal groups appear more strongly related to substance-related behaviors

than those concerning more distal groups. They also highlight the need to attend to specific reference groups when assessing the impact of social norms on cannabis use.

It is noteworthy that in the current study, weekly users perceived that their use was comparable to their friends' use and more frequent than that of students in general. This is contrary to the college drinking literature, which finds that students tend to perceive that friends and students drink more than they themselves drink (Neighbors et al., 2008b). This finding suggests that more frequent cannabis users may have a somewhat accurate sense that they use cannabis more frequently than do most other students. However, consistent with prior work in which, despite the finding that only one third of students endorsed cannabis use, the vast majority of undergraduates believed that students in general use cannabis at least once per year (Kilmer et al., 2006), both infrequent and weekly users overestimated the frequency of cannabis use of typical students. Specifically, although the majority of students who completed the survey denied current use, cannabis users in this sample estimated that students in general tend to use cannabis two to four times per month.

Given that decreases in normative beliefs lead to better outcomes during brief motivational interventions with college students (Carey et al., 2010; Terlecki et al., 2012), identification of the relative contribution of specific normative beliefs has potentially important clinical implications. Brief motivation-based interventions for college substance use (White et al., 2006b) tend to target social norms regarding students in general. In light of the current findings as well as those obtained in prior work (LaBrie et al., 2010), future work is necessary to determine whether these interventions could benefit from targeting normative beliefs concerning friends rather than students in general. For instance, future work could determine whether involving peers in brief motivational interventions with college students could change misperceptions regarding friends' substance use and thus improve outcomes. Further, given the unique relationships of coping motives to cannabis problems, clinicians may consider teaching students skills to help them better manage their negative affect.

The study should be considered in light of limitations that suggest the need for additional work in this area. First, the cross-sectional nature of the design limits our ability to test causal relations. Second, the sample consisted solely of a convenience sample of undergraduate psychology students, and replication with other populations is necessary. Third, given that participants completed study measures online, some participants may have completed measures under the influence. Fourth, injunctive norms regarding students in general and descriptive norms regarding parental use were not assessed, and future work could benefit from inclusion of these norm types. Fifth, future work could benefit from assessment of actual use (rather than perceived use) by friends.

In sum, data from the current study indicate that social norms (particularly normative beliefs regarding friends) are strongly and uniquely related to more frequent cannabis use. Further, coping motives are robustly related to cannabis use behaviors. An important next step in this line of work will be to determine whether cognitive-behavioral strategies that specifically target these cognitive factors improve treatment outcomes for college students seeking treatment to help them manage or cease their cannabis use.

References

- Aarons, G. A., Brown, S. A., Stice, E., & Coe, M. T. (2001). Psychometric evaluation of the marijuana and stimulant effect expectancy questionnaires for adolescents. *Addictive Behaviors, 26*, 219–236.
- Arbour-Nicotopoulos, K. P., Kwan, M. Y. W., Lowe, D., Taman, S., & Faulkner, G. E. J. (2010). Social norms of alcohol, smoking, and marijuana use within a Canadian university setting. *Journal of American College Health, 59*, 191–196.
- Baer, J. S. (1994). Effects of college residence on perceived norms for alcohol consumption: An examination of the first year in college. *Psychology of Addictive Behaviors, 8*, 43–50.
- Borsari, B., & Carey, K. B. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse, 13*, 391–424.
- Buckner, J. D., Bonn-Miller, M. O., Zvolensky, M. J., & Schmidt, N. B. (2007). Marijuana use motives and social anxiety among marijuana-using young adults. *Addictive Behaviors, 32*, 2238–2252.
- Buckner, J. D., Ecker, A. H., & Cohen, A. S. (2010). Mental health problems and interest in marijuana treatment among marijuana-using college students. *Addictive Behaviors, 35*, 826–833.
- Buckner, J. D., Ecker, A. H., & Welch, K. D. (2013). Psychometric properties of a valuations scale for the Marijuana Effect Expectancies Questionnaire. *Addictive Behaviors, 38*, 1629–1634.
- Buckner, J. D., Heimberg, R. G., Matthews, R. A., & Silgado, J. (2012). Marijuana-related problems and social anxiety: The role of marijuana behaviors in social situations. *Psychology of Addictive Behaviors, 26*, 151–156.
- Buckner, J. D., & Schmidt, N. B. (2008). Marijuana effect expectancies: Relations to social anxiety and marijuana use problems. *Addictive Behaviors, 33*, 1477–1483.
- Carey, K. B., Henson, J. M., Carey, M. P., & Maisto, S. A. (2010). Perceived norms mediate effects of a brief motivational intervention for sanctioned college drinkers. *Clinical Psychology: Science and Practice, 17*, 58–71.
- Chabrol, H., Ducongé, E., Casas, C., Roura, C., & Carey, K. B. (2005). Relations between cannabis use and dependence, motives for cannabis use and anxious, depressive and borderline symptomatology. *Addictive Behaviors, 30*, 829–840.
- Chapman, L. J., & Chapman, J. P. (1983). *Infrequency Scale*. Unpublished test.
- Cohen, A. S., Iglesias, B., & Minor, K. S. (2009). The neurocognitive underpinnings of diminished expressivity in schizotypy: What the voice reveals. *Schizophrenia Research, 109*, 38–45.
- Grossbard, J., Hummer, J., LaBrie, J., Pederson, E., & Neighbors, C. (2009). Is substance use a team sport? Attraction to team, perceived norms, and alcohol and marijuana use among male and female intercollegiate athletes. *Journal of Applied Sport Psychology, 21*, 247–261.
- Johnson, K., Mullin, J. L., Marshall, E. C., Bonn-Miller, M. O., & Zvolensky, M. J. (2010). Exploring the mediational role of coping motives for marijuana use in terms of the relation between anxiety sensitivity and marijuana dependence. *The American Journal on Addictions, 19*, 277–282.

- Kilmer, J. R., Walker, D. D., Lee, C. M., Palmer, R. S., Mallett, K. A., Fabiano, P., & Larimer, M. E. (2006). Misperceptions of college student marijuana use: Implications for prevention. *Journal of Studies on Alcohol, 67*, 277–281.
- LaBrie, J. W., Hummer, J. F., & Lac, A. (2011). Comparing injunctive marijuana use norms of salient reference groups among college student marijuana users and nonusers. *Addictive Behaviors, 36*, 717–720.
- LaBrie, J. W., Hummer, J. F., Lac, A., & Lee, C. M. (2010). Direct and indirect effects of injunctive norms on marijuana use: The role of reference groups. *Journal of Studies on Alcohol and Drugs, 71*, 904–908.
- Lee, C. M., Neighbors, C., & Woods, B. A. (2007). Marijuana motives: Young adults' reasons for using marijuana. *Addictive Behaviors, 32*, 1384–1394.
- Neighbors, C., Geisner, I. M., & Lee, C. M. (2008a). Perceived marijuana norms and social expectancies among entering college student marijuana users. *Psychology of Addictive Behaviors, 22*, 433–438.
- Neighbors, C., Lee, C. M., Lewis, M. A., Fossos, N., & Larimer, M. E. (2007). Are social norms the best predictor of outcomes among heavy-drinking college students? *Journal of Studies on Alcohol and Drugs, 68*, 556–565.
- Neighbors, C., O'Connor, R. M., Lewis, M. A., Chawla, N., Lee, C. M., & Fossos, N. (2008b). The relative impact of injunctive norms on college student drinking: The role of reference group. *Psychology of Addictive Behaviors, 22*, 576–581.
- Perkins, H. W., Meilman, P. W., Leichliter, J. S., Cashin, J. R., & Presley, C. A. (1999). Misperceptions of the norms for the frequency of alcohol and other drug use on college campuses. *Journal of American College Health, 47*, 253–258.
- Schafer, J., & Brown, S. A. (1991). Marijuana and cocaine effect expectancies and drug use patterns. *Journal of Consulting and Clinical Psychology, 59*, 558–565.
- Simons, J., Correia, C. J., Carey, K. B., & Borsari, B. E. (1998). Validating a five-factor marijuana motives measure: Relations with use, problems, and alcohol motives. *Journal of Counseling Psychology, 45*, 265–273.
- Stephens, R. S., Roffman, R. A., & Curtin, L. (2000). Comparison of extended versus brief treatments for marijuana use. *Journal of Consulting and Clinical Psychology, 68*, 898–908.
- Terlecki, M. A., Buckner, J. D., Larimer, M. E., & Copeland, A. L. (2012). Brief motivational intervention for college drinking: The synergistic impact of social anxiety and perceived drinking norms. *Psychology of Addictive Behaviors, 26*, 917–923.
- White, H. R., McMorris, B. J., Catalano, R. F., Fleming, C. B., Haggerty, K. P., & Abbott, R. D. (2006a). Increases in alcohol and marijuana use during the transition out of high school into emerging adulthood: The effects of leaving home, going to college, and high school protective factors. *Journal of Studies on Alcohol, 67*, 810–822.
- White, H. R., Morgan, T. J., Pugh, L. A., Celinska, K., Labouvie, E. W., & Pandina, R. J. (2006b). Evaluating two brief substance-use interventions for mandated college students. *Journal of Studies on Alcohol, 67*, 309–317.
- Wolfson, S. (2000). Students' estimates of the prevalence of drug use: Evidence for a false consensus effect. *Psychology of Addictive Behaviors, 14*, 295–298.