

# Frequency of Use Matters: The Role of Peer Norms and Approval on College Students' Marijuana Use

*Cannabis*

2018, Volume 1 (2), 14-21

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researchmj.org

DOI: 10.26828/cannabis.2018.02.002



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## ABSTRACT

Social norms play a critical role in motivation for marijuana use, particularly for emerging adults. The current report evaluated the differential impact of perceived friends' approval of use (injunctive norms) and perceived friends' and classmates' use (descriptive norms) on marijuana use in 187 college students. While injunctive norms were significantly associated with participants' marijuana use, most reported their friends would be indifferent to abstinence or infrequent use. Our model using a traditional measure of injunctive norms indicated that perceptions of friends' approval of marijuana use is not uniquely associated with use when considered in combination with descriptive norms. Given the lack of variability in perceptions of friends' approval of all but regular use, we compared our original model with an exploratory one evaluating the differential impact of injunctive norms for regular use in addition to descriptive norms. Results indicated that perceptions of friends' approval of regular use influenced participants' use above and beyond perceptions of friends' actual use. Such findings may be indicative of the current social climate, in which occasional use of marijuana is accepted, and may parallel similar findings in the binge drinking literature.

**Key words:** cannabis, undergraduates, social norms, injunctive norms, emerging adults

Marijuana use is a significant public health concern that has been linked to short- and long-term consequences, including changes in mood, impaired movement and memory, and decreases in executive functioning, especially among early onset and heavy users (Buckner, Ecker, & Cohen, 2010; Gruber, Sagar, Dahlgren, Racine, & Lukas, 2012; Curran et al, 2016). Recent work indicates that there is a softening of the perceived risk associated with marijuana use among adolescents, with the majority of high school seniors reporting that they do not consider regular marijuana use to be harmful (Johnston et al., 2015). These lowered perceptions of risk are troublesome given previous research illustrating

an inverse relationship between perception of harm and frequency of use (Bachman, Johnson, & O'Malley, 1998). This change in risk perception merits further consideration within college-aged youth, as marijuana is the leading illicit drug used by 18-25 year olds (SAMHSA, 2014). Social norms theory has provided a useful framework for understanding problematic alcohol use in this age group, and may provide similar insight for marijuana use.

Social norms theory posits that behaviors are influenced by one's perceptions of the behaviors and opinions of peers (Berkowitz, 2004; LaBrie, Hummer, Lac, & Lee, 2010). Indeed, peer influence is key to understanding a number of

health behaviors in college students, including risky sexual behaviors (Scholly, Katz, Gascoigne, & Holck, 2005) and unhealthy weight-control behaviors (Eisenberg, Neumark-Sztainer, Story, & Perry, 2005), in addition to substance use (Borsari & Carey, 2003; Buckner, 2013; LaBrie et al., 2010; Neighbors, Geisner, & Lee, 2008). Injunctive norms, or the perceived peer approval for engaging in a certain behavior, are considered separately from descriptive norms, or the perception of how frequently peers engage in the same behavior. Both descriptive and injunctive norms have been linked to alcohol use among college students, who tend to overestimate peers' drinking behaviors and approval of drinking, which is, in turn, positively associated with their own use (Borsari & Carey, 2001; Borsari & Carey, 2003; LaBrie, Hummer, Neighbors, & Larimer, 2010; LaBrie, Hummer, & Lac, 2011; Larimer et al., 2011; Neighbors, Larimer, & Lewis, 2004).

More recently, researchers have applied social norms theory to marijuana use among college students (Buckner, 2013; LaBrie et al., 2010; LaBrie et al., 2011; Neighbors et al., 2008). Similar to alcohol use, college students believe that a much higher percentage of their peers have tried marijuana (83.6% of their peers; ACHA, 2014) than actually have (18.3%; ACHA, 2014). This divergence between perceived and actual use underscores the potential importance of correcting norms for this population. Both descriptive and injunctive norms are associated with marijuana use above and beyond other cognitive factors, including expectancies and coping motives (Neighbors et al., 2008; Buckner, 2013). Perceived approval and use of closer reference groups, like close friends, show the strongest association with use behavior, highlighting the importance of reference group for the role of norms in the decision to use marijuana (LaBrie et al., 2011).

Among high school seniors, injunctive norms influence marijuana use above and beyond descriptive norms of such proximal reference groups (Neighbors et al., 2008; Buckner, 2013). However, these studies have been limited by age group (e.g., recently graduated high school seniors only, Neighbors et al., 2008), or by narrowly defining injunctive norms as approval of risky marijuana use only (i.e., regular use in combination with risky behaviors while intoxicated; Buckner, 2013). While high school

seniors are not chronologically distant from college students, there is a meaningful shift during this developmental period, punctuated by newfound autonomy, instability, identity-seeking (Merrill & Carey, 2005), and the highest rates of substance use and substance use disorders compared to other age groups (Center for Behavioral Health Statistics and Quality, 2016). Furthermore, there is not currently sufficient evidence to suggest that perceived approval of risky marijuana use alone would impact frequency of use, though lowered perceptions of risk (Johnston et al., 2015) highlight the importance of considering the continuum of marijuana use patterns in norms research. Taken together with recent concern regarding replication work in psychology (Open Science Collaboration, 2015), as well as the key role of norms research in informing prevention and intervention efforts, further investigation into the influence of norms on marijuana use in college students beyond their first academic year is merited. Thus, the current study aimed to replicate and extend previous work by examining whether injunctive norms (i.e., perception of peer approval) significantly impacts frequency of marijuana use above and beyond descriptive norms (i.e., perceived frequency of peers' marijuana use) in a college student sample of marijuana users. We hypothesized that those who perceived their friends as more approving of marijuana use would use marijuana more frequently, and that these injunctive norms would influence use above and beyond perception of friends' and classmates' actual use.

## METHOD

### *Participants*

Responses were gathered from a larger campus survey of undergraduate and graduate students on well-being, substance use, and interpersonal violence that was conducted in November, 2011. All students were invited to participate in an online, anonymous survey, which was programmed to prevent multiple responses from a single IP address. Raffle incentives including one \$100 and ten \$20 gift cards to the university bookstore were offered. Study methods were approved by the institution's board of ethics.

Inclusion criteria for the current analysis included age between 18 and 24 at the time of the survey in order to limit the sample to the typical college student age range. Further, we included only those participants who reported at least one instance of marijuana use in the two months preceding the survey. This criterion allowed us to evaluate the influence of norms on a continuum of current use patterns. Of the 612 students who participated in this larger study, 187 (30.5%) met these inclusion criteria. Participants' average age was 20.07 ( $SD = 1.43$ ) years old, and the majority of participants (73.3%) were female. The majority of the sample was White (90.9%), followed by Multiracial (4.3%), Asian (1.1%), Black (1.1%), and Latino/a (1.1%); 1.6% did not provide racial/ethnic information. Class years were well-represented, with 18.7% first year, 25.7% sophomore, 23.0% juniors, 24.1% seniors, and 8.6% graduate students. Distribution by class year for the larger sample did not differ as a function of marijuana use in the past two months [ $\chi^2(4, N=534) = 5.45, p = .245$ ].

### Measures

*Frequency of use.* Frequency of marijuana use was assessed by asking participants to answer the question "How often do you use marijuana?" Responses were coded as 0 = Never, .5 = Less than once per week, 1 = Once per week, 2 = Twice per week, 3.5 = 3-4 times per week, and 5 = 5+ times per week.

*Descriptive norms.* Descriptive norms were assessed by asking participants to indicate "How often do you think most students at your school use marijuana?" and "How often do you think your friends use marijuana?" Responses were coded following the same scheme as frequency of use (above).

*Injunctive norms.* Similar to previous studies (Neighbors et al., 2008), injunctive norms were assessed by asking participants to indicate their friends' approval if they (a) abstained from marijuana use, (b) if they tried marijuana once or twice, (c) if they used marijuana occasionally, and (d) if they used marijuana regularly. Friends' approval was used due to the importance of proximity of reference group for injunctive norms (LaBrie et al., 2011). For each item, responses

were coded as -1 = they would disapprove, 0 = they wouldn't care, and 1 = they would approve. All four items were collapsed into a single continuous variable according to the method used by Neighbors and colleagues (2008), resulting in a 6-point scale in which 6 = approval of regular use; 5 = approval of moderate but not regular use; 4 = approval of using once or twice but not more; 3 = disapproval of abstinence but not caring about or not approving of use; 2 = not caring about abstinence or use; and 1 = disapproval of regular use.

## RESULTS

All data was examined to ensure assumptions for normality were met. Missingness was less than 5% for all variables. Mean value replacement was used for all variables, with the exception of the injunctive norms questions. Given the nature of the injunctive norms questions, missing responses for these items were not mean-replaced for the 4 participants who did not provide responses, resulting in a sample size of  $n = 183$  for all analyses that included the injunctive norms variable. While mean value replacement is limited by its simplicity (Meyers, Gamst, & Guarino, 2013), this method was retained due to follow-up analyses indicating that the pattern of results did not differ when cases with missing data were excluded.

Descriptive statistics and inter-correlations for frequency of use and injunctive norms are presented in Table 1. Over half of participants (53.5%) reported using marijuana less than once per week, with about a quarter (23.0%) reporting use between 1-3 times per week and the remainder (21.4%) reporting use three or more times per week. Participants perceived greater marijuana use frequency among friends (2-4 times per week;  $M = 2.46, SD = 1.72; t(186) = -7.65, p < .001$ ) and students more generally (2 times per week;  $M = 1.94, SD = 1.30; t(186) = -2.66, p = .009$ ), compared to their own reported use (1-2 times per week;  $M = 1.57, SD = 1.61$ ). As shown in Table 1, participants' reported frequency of marijuana use was significantly associated with perceptions of friends' and classmates' use, as well as friends' approval of use.

Table 1. *Means and Intercorrelations of Variables of Interest*

	<i>M</i>	<i>SD</i>	1	2	3
1. Frequency of Use – Self $\diamond$	1.57	1.61			
2. Frequency of Use – Friends	2.46	1.72	.54***		
3. Frequency of Use – Classmates	1.94	1.30	.18*	.29***	
4. Approval of Use – Friends $\ddagger$	2.70	1.79	.20**	.34***	.12

*Note.* \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .  $\diamond$ Frequency of use was measured on a 6-point scale as follows: 0 = Never, .5 = Less than once per week, 1 = Once per week, 2 = Twice per week, 3.5 = 3-4 times per week, and 5 = 5+ times per week.  $\ddagger$ Approval of Use, or injunctive norms, were measured on a 6-point scale (see method section).

To examine the relative influence of descriptive and injunctive norms on participants' frequency of use, we conducted a multiple regression analysis (Table 2). The overall model was significant,  $F(3, 179) = 25.46$ ,  $p < .001$ , and accounted for approximately 30% of the variance in marijuana use. However, only descriptive norms for friends' use showed a significant independent influence on use ( $\beta = 0.53$ ,  $p < .001$ ,  $sr^2 = .23$ ), with descriptive norms for classmates ( $\beta = 0.03$ ,  $p = .622$ ) and the six-point injunctive norms score ( $\beta = 0.01$ ,  $p = .905$ ) failing to show a significant influence on use above and beyond descriptive norms for friends.

Examination of response patterns to the four individual injunctive norms questions indicated lack of variability in some items along the continuum of abstinence through occasional use. The vast majority (76.4%) of respondents

indicated that their friends would not care if they abstained from smoking marijuana, zero respondents indicated that their friends would disapprove of them trying marijuana once or twice, and only 2% of participants indicated that their friends would disapprove of occasional use. Friends' approval of regular use was the only question with substantial variability in responses, with 36% of respondents indicating that friends would disapprove, 48.8% indicating that their friends would not care, and 12.8% indicating that friends would approve of regular use. Regular marijuana use patterns are most consistently associated with a broad range of adverse mental and physical health outcomes (Hall, 2014). Taken together with the lack of variability in approval of other use patterns, this item pertaining to friends' approval of regular marijuana use appeared worthy of further investigation.

Table 2. *Results of Multiple Regression Analyses Predicting Marijuana Use Frequency*

	<i>B</i>	<i>SE B</i>	$\beta$	<i>p</i>	<i>F</i>	<i>p</i>	<i>R</i> <sup>2</sup>	<i>AIC</i>
Initial Model					25.46	<.001	.30	119.98
Descriptive Norms-F	.49	.06	.53	<.001				
Descriptive Norms-P	.04	.08	.03	.622				
Injunctive Norms	.01	.06	.01	.905				
Regular Use Model					28.12	<.001	.32	114.36
Descriptive Norms-F	.43	.06	.47	<.001				
Descriptive Norms-P	.02	.08	.02					
Injunctive Norms-R	.40	.17	.16	.019				

*Note.* Descriptive Norms-F = Perceived frequency of friends' use; Descriptive Norms-P = Perceived frequency of classmates' use; Injunctive Norms = Perceived friends' approval of marijuana use; Injunctive Norms-R = Perceived friends' approval of regular use only.

Thus, we conducted an exploratory regression analysis to examine whether peers' approval of only *regular* marijuana use influenced participants' marijuana use, using the injunctive norms for the regular use (injunctive norms-R) item in a model together with descriptive norms (Table 2). This overall model was significant,  $F(3, 179) = 28.12$ ,  $p < .001$ , and accounted for approximately 31% of the variance in marijuana use. Both descriptive norms for friends ( $\beta = 0.47$ ,  $p < .001$ ,  $sr^2 = .17$ ) and injunctive norms-R ( $\beta = 0.16$ ,  $p = .019$ ,  $sr^2 = .02$ ) showed significant independent influences on participants' use in this model, though descriptive norms for classmates did not ( $\beta = 0.02$ ,  $p < .001$ ).

Descriptive norms for friends accounted for a greater percentage of unique variance in the model than injunctive norms, as indicated by the squared semi-partial correlation ( $sr^2$ ). Approximately 12% of the variance in participants' use of marijuana was due to shared variance between descriptive norms and injunctive norms for regular use.

## DISCUSSION

The current study aimed to examine whether injunctive norms impact marijuana use above and beyond descriptive norms in a college sample of undergraduate and graduate students. The current study partially replicates Neighbors and colleagues' (2008) findings of a significant independent contribution for injunctive norms above and beyond descriptive norms on marijuana use. For our sample, only injunctive norms for regular marijuana use (injunctive norms-R) was uniquely associated with marijuana use, whereas overall injunctive norms were not. Our finding that descriptive norms accounted for more of the unique variance in marijuana use relative to injunctive norms also aligns with the extant literature (Neighbors et al., 2008; Buckner, 2013). In addition to highlighting the importance of perceptions of friends' approval of regular marijuana use, the current study extends previous findings of these relationships in entering college student marijuana users to a college age sample that spans across class years and into graduate school.

These findings could be indicative of the current social climate, which may normalize and even promote experimental or occasional use of

marijuana, but recognize the potential health/academic consequences associated with regular use. Further, our results align with previous work evaluating injunctive norms related to risky use among college students (Buckner, 2013). Of note, 23.6% of the sample indicated that friends would care to some extent if the participant abstained from marijuana use. Thus, college students may find themselves trying to navigate a fine line between occasional use and regular marijuana use, seeking approval from friends, and succeeding at school. This observed phenomenon is reminiscent of perceived friends' approval of binge drinking in undergraduate populations – that friends are more likely to approve of occasional alcohol consumption, but acknowledge the potentially damaging impact of more frequent or heavy drinking. For example, Strano and colleagues (2004) measured predictors of binge drinking in an undergraduate sample, and discovered that perceived friends' approval was a significant predictor of binge drinking behavior (i.e., students engaged in less binge drinking if they perceived friends' disapproval).

### *Limitations*

There were a number of limitations in this study. First, our sample is not reflective of university students in general, though similar results may be found in liberal arts colleges of similar size, of which there are over 500 in the US. Second, more recent evaluations of injunctive norms have adapted the Neighbor's et al. (2008) approach using a 7-point, rather than a 3-point, approval scale, which may better capture variability in approval of marijuana use. Despite assurance of anonymity, the use of self-report and sensitivity of substance use as a topic may have resulted in more conservative estimates of marijuana use.

A number of additional limitations are due to the use of a larger dataset in which participant burden was an important consideration. First, we included only participants who reported any marijuana use in the past two months, which allowed for evaluation of the influence of norms along the continuum of current use. However, additional analyses considering the influence of norms on any lifetime history of marijuana use (an item not included in our database), could provide additional information with respect to the

continuum from limited experimentation to regular use. Second, a more traditional measure of marijuana use that does not impose restrictions to the upper limit of use (i.e., 5+ times per week) could provide a more accurate measure of the frequency and severity of marijuana use. The question in the current study was designed to match a series of similar questions in the climate survey, and is thus a less sensitive measure than those used in studies focused specifically on substance use issues. Nonetheless, our upper limit of five or more times per week aligns with the epidemiological definition of “regular” or “heavy” use that is most often associated with negative health outcomes (Hall, 2014). Similarly, future research into the relationship between social norms and marijuana use should consider measuring frequency and consequences of use (Buckner, 2013) concurrently, as each has been considered in isolation. Reference groups, like friends, may report more disapproval when someone uses and engages in risky behaviors (i.e., driving under the influence), and this may or may not align closely with frequency of use.

### Conclusion

The current results suggest that perceptions of others’ use impacts frequency of marijuana use throughout students’ college careers. Notably, our findings provide preliminary evidence for the role of marijuana use frequency in social norms research and applications, a consideration that should be explored further in future work. Emerging findings suggests that social norms related to marijuana use can be modified with brief interventions (Elliot & Carey, 2012) and that marijuana use decreases in the short term in response to such interventions (e.g., over the semester; Lee et al., 2013). However, future research on efficacious prevention and intervention programs with lasting, long-term effects for marijuana users is greatly needed. In addition to considerations of use frequency, the influence of other close reference groups, including parents (Napper, Hummer, Chithambo, & LaBrie, 2015), will be important to monitor amidst ongoing societal shifts in perception of marijuana use.

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**Funding:** This work was supported by the U.S. Department of Justice under Grant No. 2009-WA-AX-0012; and the U.S. Department of Education under Grant No. Q184H090012.

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