College Student Marijuana Involvement: Perceptions, Use, and Consequences across 11 College Campuses

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Abstract

Background—Marijuana is currently the most commonly used illicit drug in the United States, and with the movement toward legalization of recreational marijuana, the country faces numerous issues regarding policy, prevention, and treatment of marijuana use. The present study examines the prevalence of marijuana use and consequences and compare users and non-users on a wide range of other marijuana-related constructs among college students across 11 universities.

Method—Participants included 8,141 college students recruited from the psychology department participant pools of 11 universities throughout the US, including four major regions of the US (West, South, Midwest, Northeast) and states with varying policies regarding the legality of marijuana use.

Results—We observed marijuana use rates similar to representative samples of young adults and college students (i.e., 53.3% lifetime marijuana users, 26.2% past month marijuana users). About 1 in 10 past month marijuana users experienced no consequences from their use, whereas nearly 1 in 10 experienced 19 or more consequences. Lifetime marijuana users had more positive perceptions of marijuana compared to non-users on a wide-range of marijuana-related constructs.

Conclusions—We report descriptive statistics on a wide range of marijuana-related variables. We hope that these data provide a useful baseline prior to increased legalization of recreational marijuana use. Multi-site studies like this one are needed to study the risky and protective factors for problematic marijuana use. These findings can inform interventions and public policy.

Keywords

marijuana use; marijuana consequences; college students; social norms; marijuana motives

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Considering major shifts in marijuana laws in the United States, Bob Dylan's (1964) lyrics are, indeed, true today: "The times, they are a changin'." As of mid-2016, four states (Alaska, Colorado, Oregon, and Washington) and the District of Columbia have legalized possession and recreational use of marijuana. Medical marijuana has become legal in 23 states and the District of Columbia. At least eleven states have decriminalized possession of marijuana (i.e., they have reduced the penalties associated with possession) and it is plausible if not likely that these states will move toward legalization soon (Stebbins, Frohlich, & Sauter, 2015).

In the current climate of spreading legalization and decriminalization of marijuana use, there are countless issues facing the country regarding policy, prevention, and treatment of marijuana use. Although data from large epidemiological studies demonstrate that chronic marijuana use is associated with various psychosocial and medical problems, many questions still remain. For example, as more states make it legal to possess and use marijuana:

- How will recreational marijuana use in the general public be impacted?

- How will recreational marijuana use among adolescents and young adults be impacted?

- How will perceptions of healthy versus unhealthy use of marijuana be determined?

- What new standards might be necessary for the diagnosis of cannabis use disorder?

- What are the likely public health consequences of legalization?

- How will attitudes regarding marijuana change?

- How can regulation of legal marijuana markets minimize potential harm?

Hasin and her colleagues (2015) analyzed data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) from years 2001–2002 and 2012–2013 to determine changes in the prevalence of cannabis use disorders (CUD) based on DSM-IV criteria, including marijuana abuse and dependence. They found that past-year prevalence of DSM-IV CUD in 2012–2013 was 2.9%, approximately double the prevalence of those with CUD in 2001–2002 (1.5%). They also found that approximately 30% to 36% of past-year users between 2001 and 2013 had a CUD. In a sample of first-year college students between the ages of 17 and 20 years old, Caldeira, Arria, O'Grady, Vincent, and Wish (2008) found that 9.4% of these students had CUD, or 24.6% of those who reported cannabis use in the past year. Students who had used cannabis five times or more over the past year had various cannabis-related problems. According to the National Survey of Substance Use and Health (NSDUH), the peak period of marijuana use occurs between the ages 18 and 25 years old (Center for Behavioral Health Statistics and Quality, 2015), which is also the age of most college students in the United States (U.S. Census Bureau, 2014). The long-term consequences of heavy marijuana use (especially in younger populations) may include addiction, altered brain development, poor educational outcome, increased likelihood of

school dropout, cognitive impairment, lower IQ, diminished life satisfaction, and lower achievement (Volkow, Baler, Compton, & Weiss, 2014).

Altogether, these findings suggest that college students are an important group to study with regards to marijuana use. In the Monitoring the Future study (Johnston, O'Malley, Bachman, et al., 2015), respondents in 2014 were asked to rate the risk associated with marijuana use. Only 8–10% of respondents between 19 and 30 years old rated experimental use as a "great risk," while approximately 35% rated regular use to carry "great risk." This latter response (35%) reflected a steep decline in the assessment of risk from the year 2006, when 55–58% of respondents perceived regular marijuana use to be a "great risk." Johnston and colleagues (2015) attribute this decline in the perception of marijuana risk to the legalization of recreational and medical marijuana. Furthermore they attribute peak levels of daily marijuana use to decreased perceptions of risk. While surveys like the MTF and NSDUH attempt to estimate marijuana-related attitudes of college students (e.g., MTF, NSDUH), these surveys are necessarily limited in their ability to assess a wide range of marijuana-related constructs.

In the present study, we examine a wide range of marijuana-related constructs that may be profoundly impacted by legalization/decriminalization of marijuana use, and/or hold promise as predictors of marijuana-related outcomes. For example, to capture the overall level and variability in personal beliefs, we assessed beliefs regarding marijuana-related policies and perceived impacts of marijuana. In terms of predictors, marijuana use motives (Simons, Correia, Carey, & Borsari, 1998), social norms (Clayton, Geisner, & Lee, 2008; Connor & McMillan, 2010; Napper, Kenney, Hummer, Firot, & LaBrie, 2016), identification with being a marijuana user (Neighbors, Foster, Walker, Kilmer, & Lee, 2013), and perceived availability of marijuana (Swaim, 2003) have been found to predict higher marijuana use and/or negative consequences. On the other hand, use of protective behavioral strategies (Pedersen, Hummer, Rinker, Traylor, & Neighbors, 2016) has been found to predict lower marijuana use/consequences. Taken together, assessment of these constructs can serve as an informative baseline for future research examining the antecedents, mechanisms, and sequelae of marijuana-related policy changes.

Given the unprecedented changes in the legal status of marijuana occurring in states across the United States (Stebbins, Frohlich, & Sauter, 2015), it is imperative that large scale studies be conducted to observe the impact of such policy changes. The present study reports descriptive statistics and basic findings from a large, multi-site study conducted by the Marijuana Outcomes Study Team (MOST) designed to examine many fundamental research questions. In the present study, we examined the prevalence of marijuana use among college students in the United States and characterized the different levels of marijuana-related consequences experienced by current (i.e., past month) marijuana users. Further, we examined a wide range of marijuana-related constructs that may cause or be influenced by marijuana-related policy changes including marijuana descriptive norms, marijuana injunctive norms, marijuana internalized norms, beliefs regarding marijuana users, marijuana user identification, perceived availability of marijuana, protective behavioral strategies for marijuana, marijuana motives, and beliefs regarding policies and impacts of

marijuana. As a preliminary analysis, we examined the differences between lifetime marijuana users and non-users on these marijuana-related constructs.

Method

Participants and Procedures

We recruited college students from the psychology department participant pools at 11 universities throughout the United States (see Supplemental Figure 1). This protocol was approved by the institutional review boards at each participating university. At each site, a consent document was presented to the participants on which they provide consent by either clicking "Continue" or by answering affirmatively to a question of whether they would like to participate. Although we received 8,894 total survey entries, 1.80% (n=160) were identified as duplicate cases, .004% (n=37) reported their age to be under 18 years old, and 6.83% of responders missed over one-third of the items (n=556), leaving a sample of 8,141 respondents. To ensure that data collection was standardized at each data collection site, all data were collected using the same software (i.e., PsychData), and all participants completed the same survey items in the same order and format across all sites. All data were collected between September 2015 and May 2016 by participants who were awarded research participation credit. Participating universities were deliberately chosen to represent the four major regions of the United States (West, South, Midwest, Northeast) as defined by the United States census, and to include states with varying policies regarding the legality of marijuana use, including two states with legal recreational marijuana use (Colorado and Washington), four states with legal medical marijuana use (New Mexico, New York, Wyoming, and California), and five states without legal provisions for marijuana use (Alabama, Virginia, North Dakota, Texas, Kansas).

The majority of the sample was White (64.7%), with 12.1% Black/African American, 15.5% Asian, 3.1% American Indian/Alaska Native, 1.3% Native Hawaiian/Pacific Islander, and 9.3% Other. About 18.0% of the sample reported being Hispanic, Latino, or of Spanish origin. Women were over-represented in our sample (66.9%), likely as a result of recruiting from psychology department participant pools. About 93.8% of the sample were between the ages of 18 and 25 years old (M=20.40, Median=19.00, SD=4.19). About 6.7% of the sample reported being a student athlete, and about 14.2% reporting being in a fraternity or sorority. Although the modal student was a freshman (45.0%), sophomores (22.3%), juniors (17.9%), and seniors (13.3%) were also represented. Additional basic and school-related demographic information on our full sample as well as each site is shown in Supplemental Tables 1 and 2.

Measures

Cronbach's alphas for multi-item measures are displayed along the diagonal in Table 1.

Marijuana use—To determine lifetime marijuana user status, we asked, "In your lifetime, have you ever used marijuana in any form?" If participants answered "yes," they were branched to two additional questions: 1) "Approximately how many days in your lifetime have you used marijuana?", and 2) "On how many days during the last 30 days did you use

marijuana?" If participants responded with one or greater to this second question, they were then asked the remainder of the marijuana-related questions.

More detailed marijuana use frequency was assessed using a measure patterned after the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). Specifically, each day of the week was broken down into six 4-hour blocks of time (12a-4a, 4a-8a, 8a-12p, etc.), and participants were asked to report at which times they used marijuana during a "typical week" and their "heaviest use week" in the past 30 days. From this measure, we created two marijuana use frequency estimates by summing the total number of time blocks for which they reported using during the typical and heaviest use weeks (ranges: 0–42). The initial measure has shown adequate reliability and validity in previous research (Dvorak & Day, 2014; Williams, Adams, Stephens, & Roffman, 2000). To our knowledge, the measure of "heaviest week" has not been used in prior studies, but was modeled after measures of heavy weekly alcohol use.

Marijuana consequences—The 50-item Marijuana Consequences Questionnaire (MACQ; Simons, Dvorak, Merrill, & Read, 2012) assesses eight domains of marijuana consequences: social-interpersonal consequences (6 items), impaired control (6 items), negative self-perception (5 items), self-care (9 items), risk behaviors (8 items), academic/ occupational consequences (5 items), physical dependence (4 items), and blackout use (7 items). Participants are asked whether they experienced each of these consequences due to their marijuana use in the past month. Participants respond to dichotomously coded responses (0=*no*, 1=*yes*). Each subscale is summed to provide a number of marijuana problems experienced in each category as well as a summed total score. Previous research supports the test-retest reliability, convergent, and discriminant validity of the MACQ as a measure of marijuana-related problems (Simons et al., 2012). This scale is adapted from the Young Adult Alcohol Consequences Questionnaire (YAACQ; Read et al., 2006).

Marijuana descriptive norms—Marijuana descriptive norms were assessed using the same marijuana use frequency measure to assess one's own marijuana use (see above); however, the grids for typical and heaviest use weeks were filled out in reference to the "typical college student."

Marijuana injunctive norms—Marijuana injunctive norms were assessed with 9 items that asked about others' views of marijuana use. Items ranged from "strong disapproval" to "strong approval" by three reference groups (best friends, college students, parents) for three behaviors (using marijuana, using marijuana daily, and using marijuana to get high). For example, they rated the extent to which their best friends, college students, and their parents would approve of using marijuana, using marijuana daily, and using marijuana to get high. Averaging across the three behaviors, injunctive norms composites were created for the three reference groups.

Marijuana availability—We assessed both the ease with which subjects could obtain marijuana ("How difficult is it for you to obtain marijuana?") and their perceptions regarding others' ability to obtain marijuana ("How difficult is it for the typical college student to obtain marijuana?").

Marijuana internalized norms—Using a measure developed for the present study, we modified 13 items from the College Life Alcohol Salience Scale (CLASS, Osberg et al., 2010) to reference "using marijuana" instead of "drinking" in order to assess marijuana internalized norms, or the tendency to believe marijuana use is an integral part of the college experience. For example, "To get high on marijuana is a college rite of passage" and "A college party is not a true college party without marijuana."

Marijuana user beliefs—Beliefs about marijuana users were assessed using 11 items ranked on a 5-point Likert-type scale (1=completely disagree, 5=completely agree). Items were developed from focus groups of college students in Fall 2014 (see Dvorak et al., under review). Items assess the individual perceptions of marijuana users (sample item: "Marijuana Users are more fun to be around than non-users.").

Marijuana identification—Marijuana identification was adapted from the Smoker Self-Concept Scale (Shadel & Mermelstein, 1996) and the Alcohol Self-Concept Scale (Lindgren et al., 2014). Participants rate their agreement from 1 (strongly disagree) to 6 (strongly agree) in response to five statements about how much marijuana plays a part in their life and personality, and others' perceptions of the role of marijuana in their life (e.g., "Marijuana is a part of 'who I am'").

Protective behavioral strategies—Protective behavioral strategies for marijuana were assessed using a 50-item version of the Protective Behavioral Strategies-Marijuana (PBSM; Pedersen et al., 2016) scale. This measure consists of behaviors engaged in while using marijuana to reduce marijuana-related problems (for example, "Only use at home."). Items are rated on a 6-point Likert-type scale from 1 (never) to 6 (always). Previous research supports the validity and reliability of this measure (Pederson et al., 2016). The measure provides a single index of PBSM use.

Marijuana motives—Based on the Drinking Motives Questionnaire (DMQ; Cooper et al., 1994), the 25-item Marijuana Motives Questionnaire (MMQ; Simons, Correia, Carey, & Borsari, 1998) assesses five distinct marijuana motives: enhancement (5 items), conformity (5 items), expansion (5 items), coping (5 items), and social motives (5 items). Each item is rated on a 5-point Likert-type scale from 1 (almost never/never) to 5 (almost always/always). Previous research has shown adequate reliability and validity for this measure (Simons et al., 1998).

Policies and impacts of marijuana use—We developed a 10-item Policies and Impacts of Marijuana Use Scale (PIMUS) for the present study to assess individuals' beliefs regarding legalization of recreational and medical marijuana use, decriminalization, addiction potential, and whether it is safer than alcohol. Our 7-point scale anchors ranged from 1 (Strongly Disagree) to 7 (Strongly Agree). Examples of items include, "Using marijuana should be legal for the treatment of physical illnesses" and "Adults caught selling marijuana to adults should not be charged with a crime."

Results

Prevalence of Marijuana Use and Consequences

Across campuses, lifetime prevalence ranged from 42.5% to 63.6%, with an average 53.3% lifetime prevalence in the total sample. Past month prevalence ranged from 15.5% to 38.7%, with an average of 26.2% past month prevalence in the total sample. Near daily use (i.e., 20+ days of use in the past month) ranged from 2.8% to 9.9%, with an average of 5.8% near daily use in the total sample. On average, marijuana users experienced approximately eight distinct negative consequences from marijuana use in the past 30 days. Among past month marijuana users, 9.2% reported experiencing no consequences, 24.2% reported experiencing 1 – 3 consequences, 30.1% reported experiencing 4–8 consequences, 26.9% reported experiencing 9–18 consequences, and 9.6% reported experiencing 19 or more consequences in the past 30 days. The most commonly endorsed consequences were driving a car while high (49.2%), saying or doing embarrassing things (45%), using on nights when planned not to use (44.9%), and feeling in a fog, sluggish, tired or dazed the morning after use (44.7%). The least commonly endorsed consequences were injuring someone else (1.7%), getting into physical fights (2%), having unprotected sex (3.1%), and damaging property or doing something disruptive (3.4%). Supplemental Table 3 summarizes marijuana use and consequences across data collection sites.

Descriptive Statistics for Marijuana-Related Constructs

Supplemental Table 4 summarizes the descriptive statistics for a wide range of marijuana-related correlates in the full sample and across data collection sites. Correlations among these variables are shown in Table 1. Marijuana users perceived that the typical college student consumed marijuana more frequently during the typical week (M=9.06, SD=7.99) compared to themselves (M=5.76, SD=6.92), t(2128)=17.230, $p < .001$, d=.376. They also perceived that the typical college student consumed marijuana more frequently during the heaviest use week in the past 30 days (M=10.23, SD=8.81) compared to themselves (M=6.78, SD=8.45), t(2128)=17.068, $p < .001$, d=.370. Marijuana users were most likely to report using marijuana for enhancement motives (M=3.65), followed by social motives (M=2.67), expansion motives (M=2.44), coping motives (M=2.20), and conformity motives (M=1.48).

In the full sample, participants viewed typical college students to be between "Neutral" and "Somewhat Approving" (M=4.80) of marijuana, one's own best friends to be between "Somewhat Disapproving" and "Neutral" (M=3.91) of marijuana use, and one's parents to be between "Strongly Disapproving" and "Disapproving" (M=1.90) of marijuana use. Thus, typical college students were perceived to be significantly more approving of marijuana use than one's best friends, t(8131)=50.76, $p < .001$, d=.579. Both typical college students, t(8128)=151.30, $p < .001$, d=1.171, and one's best friends, t(8129)=101.37, p < .001, d=1.683, were perceived to be significantly more approving of marijuana use then one's parents. Based on the average score on the Marijuana Internalized Norms Scale, the sample largely did not see marijuana use to be an integral part of the college experience (M=2.08, average of "Disagree"). Further, the sample had somewhat negative views toward marijuana users (M=2.48, below neutral score of 3).

On a scale of 1–5, students reported their ability to obtain marijuana on average to be 3.55 (between "Fairly Difficult" and "Fairly Easy)." In contrast, they reported the typical college student's ability to obtain marijuana, on average, to be significantly easier (M=4.25), t(8067)=49.19, $p < .001$, d=.622.

Table 5 summarizes the descriptive statistics for beliefs regarding marijuana legalization, decriminalization, addiction potential, and safety relative to alcohol in the full sample and across data selection sites. We conducted one-sample t-tests examining whether the average scores on these beliefs items were above or below the neutral midpoint of 4 ("Neither Agree nor Disagree"). All scores were significantly ($p < .001$) above or below this neutral point. Students tended to be in favor of legalization of medical marijuana for physical (M=5.37) or mental illnesses (M=5.16), in favor of legalization of recreational marijuana for adults (M=4.37) but not for children (M=2.13), and in favor of decriminalizing the use of marijuana by adults (M=4.18) but not for selling or use by children (2.22 < Ms < 3.76), disagreed with the notion that people cannot become addicted to marijuana (M=2.98), but agreed that using marijuana is safer than drinking alcohol (M=4.33).

Comparing Lifetime Marijuana Users and Lifetime Non-Users

Table 2 summarizes the comparisons between lifetime marijuana users and non-users on the marijuana-related constructs reviewed above. Other than on marijuana descriptive norms, lifetime marijuana users reported medium to large differences from non-users on all other variables (ds .283 – 1.099). Compared to non-users, lifetime marijuana users perceived others to be more approving of marijuana, especially one's best friends. Compared to non-users, lifetime marijuana users reported significantly higher internalized norms, but these mean scores remained below the neutral midpoint (3="uncertain or unsure") indicating that lifetime marijuana users do not necessarily perceive marijuana to be an integral part of the college experience. Compared to non-users, lifetime marijuana users report significantly more positive beliefs about marijuana users, but these mean scores were below the midpoint ("Neither Agree Nor Disagree") suggesting that even lifetime marijuana users do not perceive marijuana users to be better than non-users. Lifetime marijuana users reported significantly stronger identification with being a marijuana user, but both lifetime marijuana users and non-users reported low identification with being a marijuana user. Compared to non-users, lifetime marijuana users perceived that the typical college student had somewhat easier access to obtaining marijuana, but perceived that they personally had much easier access to marijuana.

Compared to non-users, lifetime marijuana users were significantly more supportive of marijuana legalization and decriminalization, were more likely to view marijuana as not addicting, and viewed marijuana to be safer than alcohol. On average, both lifetime users and non-users were supportive of medical marijuana for physical and mental illnesses, both were against legalization of recreational marijuana use by children, both were against decriminalization of marijuana use involving children, and both disagreed that marijuana is not addicting. Lifetime marijuana users tended to be in favor legalization of recreational marijuana for adults and decriminalization of use and dealing marijuana among adults,

whereas non-users tended to be against these. Lifetime users tended to believe using marijuana to be safer than drinking alcohol, whereas non-users did not.

Discussion

Marijuana Use Rates among College Students

The present study reports basic findings, including descriptive statistics, from a large, multi-site study conducted by the Marijuana Outcomes Study Team (MOST). In our first year of collaborating we obtained over 8,000 participants from 11 different universities across the United States, representing every major region. In the present sample, the weighted average of lifetime marijuana use during 2015–2016 was 53.3% and the unweighted average of lifetime marijuana use was 52.5%. The prevalence of lifetime marijuana use among college students in Monitoring The Future (MTF) study was 48.5% in 2014 (Johnston et al., 2015), and lifetime prevalence was 52.6% among individuals ages 18–25 years old in NSDUH in 2014 (Center for Behavioral Health Statistics and Quality, 2015). In the present sample, the weighted average of past month marijuana use was 26.2% and the unweighted average of lifetime marijuana use was 26.8%. These rates were somewhat higher than past month marijuana use rates reported in MTF (20.8%) and NSDUH (19.6%) rates in 2014. Taken together, we observed prevalence rates of lifetime marijuana use comparable to recent nationally representative samples and prevalence rates of past month marijuana use that were somewhat higher than rates obtained as part of MTF (Johnston et al., 2015) and NSDUH (Center for Behavioral Health Statistics and Quality, 2015). As more recent reports are released from the MTF and NSDUH studies, we will be able to determine if the somewhat higher past month prevalence rates obtained in the present study reflect a general trend of increasing marijuana use in this population, or if they reflect idiosyncrasies in our sampling procedures.

Marijuana Consequences among College Students

Among current marijuana users (i.e., reporting use in the past month), we observed considerable variability in the experience of negative consequences from marijuana use. Although nearly one in ten users did not report any negative consequences from their marijuana use, nearly one in ten users reported experiencing 19 or more (out of 50 possible) negative consequences from their marijuana use. These results highlight the importance of distinguishing between non-problematic and problematic marijuana use. Although several safe use guidelines are available for alcohol consumption in the United States (National Institute on Alcohol Abuse and Alcoholism, 2005; McGuire, 2011), there is little empirically-based guidance regarding safe use of marijuana. Although the illicit status of marijuana may have delayed the development of such guidelines, the increasing number of legal marijuana markets highlights the importance of developing such guidelines. Without such empirically-based guidelines, we expect that psychologists, counselors, psychiatrists, and other health care professionals are likely to provide recommendations to clients and patients based on personal beliefs rather than science. Therefore, it is important that future investigations identify factors and characteristics that distinguish between problematic and non-problematic use in service of developing safe use guidelines that have strong clinical utility.

Normative (Mis)Perceptions among College Students

Supporting a large substance use literature (e.g., Borsari & Carey, 2003), we found that marijuana users exhibited a self-other discrepancy such that they perceived the typical college student to use marijuana at rates higher than themselves. The existence of this discrepancy as well as the empirical support for a robust correlation between descriptive norms and marijuana use (Kilmer et al., 2006) supports the utilization of personalized normative feedback interventions in this population. Interestingly, this same self-other discrepancy was observed for perceived availability of marijuana such that individuals perceived that the typical college student had higher access to marijuana than themselves; this trend was found among both lifetime marijuana users and non-users. Although personalized normative feedback interventions have demonstrated some limited support targeting marijuana outcomes (e.g., Lee, Neighbors, Kilmer, & Neighbors, 2010; Lee et al., 2013; Palfai et al., 2014), these interventions are in their infancy relative to personalized normative feedback interventions targeting college student alcohol use (Carey, Scott-Sheldon, Elliott, Garey, & Carey, 2012). Additional research is needed to identify how to best target normative misperceptions surrounding marijuana use. For example, research is needed to identify what factors might influence efficacy of norm-based interventions for marijuana (e.g., social identity, Neighbors, Foster, Walker, Kilmer, & Lee, 2013) and what aspects of marijuana use should be targeted (e.g., frequency of marijuana use, quantity of marijuana use, marijuana-related consequences, protective behavioral strategies for marijuana).

Consistent with findings of LaBrie, Hummer, and Lac (2011), both marijuana users and non-users perceived parental approval of marijuana use to be low, typical college students' approval to be significantly higher, and friends' approval to be related to user status (i.e., marijuana users report best friends to have high approval, non-users report best friends to have low approval). The degree to which norm-based interventions for marijuana should address injunctive norms is another area of research that needs attention.

Policy Belief Differences between Lifetime Users and non-Users

Although lifetime marijuana users reported higher support for legalization and decriminalization compared to non-users, lifetime marijuana user status differentiated some beliefs regarding important public policies surrounding marijuana use more than others. For example, neither lifetime marijuana users nor non-users were supportive of marijuana use among children. Interestingly, in our sample we found that lifetime marijuana users tended to be in favor of legalization of recreational marijuana use whereas non-users tended to be against legalization of recreational marijuana use. It will be important to examine the degree to which personal experience with marijuana influences perceptions regarding marijuana legalization and vice versa.

Limitations

It is important to note limitations of the present study. Although our goal was to characterize marijuana use and consequences across multiple college campuses, we did not take active steps to ensure that the sample was nationally representative. For example, we did not restrict the number of responses from each university and did not attempt to collect a

balanced sample on demographic variables. Most notably, women are over-represented in our sample. Relatedly, all participants were recruited from psychology department participant pools. One strength of the present study is that all participants were recruited in essentially the same manner and completed an identical survey. However, some biases may be present based on sampling from psychology department participant pools. Although participants were recruited to complete a "survey assessing psychological variables," we also noted that we were "interested in perceptions and behaviors related to marijuana use." Hence, it may be that self-selection may have led to more individuals in the study with extreme views.

Conclusion

We observed prevalence rates of lifetime marijuana use comparable to nationally representative samples (Johnston et al., 2015; Center for Behavioral Health Statistics and Quality, 2015), and prevalence rates of past month marijuana use that were somewhat higher (~6% higher). The experience of negative consequences across marijuana users varied widely, reflecting the need to differentiate between problematic and non-problematic marijuana use. Lifetime marijuana users held many more favorable perceptions regarding marijuana compared to non-users, but the general patterns of normative misperceptions were similar across users and non-users. By collecting and reporting detailed descriptive statistics on a wide range of putative correlates of marijuana-related outcomes and beliefs regarding important public policies surrounding marijuana, we hope that this study can serve as an informative baseline from which changes can be observed as a result of increased legalization of marijuana. Future investigations by the Marijuana Outcomes Study Team will attempt to monitor such trends over time, and answer key research questions concerning the antecedents and sequelae of distinct marijuana use patterns among college students.

Acknowledgments

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Highlights

We examined the prevalence of marijuana use and consequences across 11 universities

We observed marijuana use rates similar to representative samples of college students

We observed large differences in the number of consequences experienced

Marijuana users had more positive perceptions of marijuana compared to non-users

These data provide a useful baseline prior to increased legalization of marijuana use

Table 1

Correlations and descriptive statistics among marijuana-related constructs in the full sample

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Marijuana Use Typical	—																		
2. Marijuana Use Heavy	.86	—																	
3. Descript. Norms Typical	.31	.24	—																
4. Descript. Norms Heavy	.37	.42	.54	—															
5. Injunctive Norms-BF	.30	.32	.06	.12	(.93)														
6. Injunctive Norms-CS	.07	.06	.17	.16	.55	(.89)													
7. Injunctive Norms-Par	.23	.25	.00	.06	.38	.16	(.91)												
8. Internalized Norms	.28	.24	.02	.07	.48	.22	.35	(.89)											
9. Marijuana User Beliefs	.26	.25	−.01	.04	.43	.12	.34	.57	(.77)										
10. Marijuana Identification	.52	.50	.02	.07	.26	.06	.28	.49	.36	(.96)									
11. Marijuana Avail. Self	.18	.19	−.00	.06	.47	.27	.24	.36	.28	.18	—								
12. Marijuana Avail. CS	.04	.05	.14	.14	.23	.29	.07	.11	.06	.03	.46	—							
13. Prot. Beh. Strat.	−.48	−.47	−.15	−.18	−.18	.00	−.15	−.33	−.25	−.45	−.11	.02	(.96)						
14. Social Motives	.16	.13	.03	.02	.20	.17	.06	.40	.16	.30	.01	−.04	−.13	(.87)					
15. Coping Motives	.24	.20	.09	.11	.09	.09	.08	.38	.20	.40	−.01	.06	−.22	.53	(.89)				
16. Enhancement Motives	.23	.24	.02	07	30	17	09	.25	.23	.23	.12	.04	−.14	.49	.28	(.86)			
17. Conformity Motives	−.03	−.07	−.06	−.08	−.06	−.01	.03	.24	−.04	.21	−.10	−.06	−.06	.33	35	−.07	(.89)		
18. Expansion Motives	.28	.26	.06	.09	.20	.05	.15	.38	.31	.43	.01	−.07	−.21	.43	.50	.35	29	(.92)	
19. Consequences	.35	.35	.06	.15	.05	−.07	.01	.23	.00	.33	.02	−.07	−.40	.15	.28	.10	.19	.21	(.92)
M	5.76	6.78	11.03	10.33	3.91	4.80	1.90	2.08	2.48	1.63	3.55	4.25	4.14	2.67	2.20	3.65	1.48	2.44	8.10
SD	6.92	8.45	8.27	9.31	1.84	1.42	1.24	0.71	0.60	1.18	1.43	0.73	0.94	1.02	1.05	0.98	0.77	1.16	7.83

Note. Ns range from 2116 (among variables only assessed among past month marijuana users) to 8133.

Table 2

A comparison of lifetime marijuana users and non-users on marijuana-related constructs and beliefs.

General Marijuana-Related Correlates	Lifetime Use?				Beliefs Regarding Marijuana	Lifetime Use?			
	No	Yes				No	Yes		
	M (SD)	M (SD)	t (p)	d		M (SD)	M (SD)	t (p)	d
Descript. Norms Typical (range 0–42)	11.41 (7.95)	10.70 (8.52)	3.865 (<.001)	−.086	To treat physical illnesses (range 1–7)	4.84 (1.75)	5.84 (1.57)	27.90 (<.001)	.602
Descript. Norms Heavy (range 0–42)	10.32 (9.26)	10.36 (9.35)	.200 (.841)	.004	To treat mental illness (range 1–7)	4.61 (1.76)	5.63 (1.53)	27.77 (<.001)	.620
Injunctive Norms-BF (range 1–7)	2.96 (1.69)	4.74 (1.55)	49.46 (<.001)	1.099	Recreationally to adults (range 1–7)	3.34 (1.88)	5.27 (1.69)	48.42 (<.001)	1.081
Injunctive Norms-CS (range 1–7)	4.45 (1.59)	5.12 (1.16)	21.97 (<.001)	.487	Recreationally to children (range 1–7)	1.88 (1.37)	2.34 (1.58)	13.88 (<.001)	.283
Injunctive Norms-Par (range 1–7)	1.56 (0.99)	2.20 (1.36)	23.90 (<.001)	.545	For adults using (range 1–7)	3.29 (1.91)	4.95 (1.87)	39.26 (<.001)	.878
Marijuana Avail. Self (range 1–5)	2.89 (1.51)	4.12 (1.07)	17.23 (<.001)	.953	For adults dealing (range 1–7)	2.96 (1.87)	4.46 (1.92)	35.38 (<.001)	.792
Marijuana Avail. CS (range 1–5)	4.10 (0.79)	4.37 (0.65)	42.59 (<.001)	.375	For children using (range 1–7)	2.55 (1.66)	3.45 (1.80)	22.98 (<.001)	.520
Internalized Norms (range 1–5)	1.76 (0.63)	2.35 (0.67)	40.98 (<.001)	.908	For adults dealing to child. (range 1–7)	1.92 (1.49)	2.48 (1.71)	15.43 (<.001)	.350
Marijuana User Beliefs (range 1–5)	2.26 (0.60)	2.67 (0.54)	32.44 (<.001)	.719	Not Addicting (range 1–7)	2.43 (1.63)	3.46 (1.90)	25.91 (<.001)	.584
Marijuana Identification (range 1–7)	1.39 (0.98)	1.84 (1.30)	17.68 (<.001)	.395	Safer than alcohol (range 1–7)	3.42 (1.80)	5.13 (1.73)	43.53 (<.001)	.969