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It Depends on When You Ask: Motives for Using Marijuana Assessed Before versus After a Marijuana Use Event

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Abstract

Marijuana use motives are typically evaluated retrospectively using measures that summarize or generalize across episodes of use, which may compromise validity. Using Ecological Momentary Assessment data, we examined the main reason for a specific marijuana use event measured both prospectively and retrospectively. We then determined reason types, event characteristics, and user characteristics that predicted change in reason. Thirty-six medical outpatients age 15 to 24 years who used marijuana two times a week or more used a handheld computer to select their main reason for use from the five categories of the Marijuana Motives Measure (Simons, Correia, & Carey, 1998) just before and after each time they used marijuana over two weeks ($n = 263$ events with before/after reason). Reasons were examined individually and according to dimensions identified in motivational models of substance use (positive/negative, internal/external). Reason assessed before use changed to a different reason after use for 20% of events: 10% of events for pleasure; 21%, to cope; 35%, to be more social; 55%, to expand my mind; and 100%, to conform. In the multivariable model, external and expansion reasons each predicted change in reason for use ($p < 0.0001$ and $p = 0.001$, respectively). Youth were also more likely to change their reason if older ($p = 0.04$), if male ($p = 0.02$), and with weekend use ($p = 0.002$). Retrospective assessments of event-specific motives for marijuana use may be unreliable and

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Contributors

Dr. Shrier was the PI of the study, designed the study, supervised the analysis, and interpreted the results. Dr. Scherer developed and implemented the analytic plan, and contributed to interpretation of the results. Dr. Shrier wrote the manuscript and Dr. Scherer contributed to and approved the final manuscript.

Conflict of Interest

Both authors declare that they have no conflicts of interest.

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therefore invalid for a substantial minority of events, particularly if use is for external or expansion reasons.

Keywords

Marijuana; motive; reason; event; youth; momentary

1. Introduction

Frequent marijuana use is a growing problem among adolescents and young adults in the United States (Johnston, O'Malley, Bachman, & Schulenberg, 2011). Different motives for using marijuana have been associated with marijuana use frequency, use-related problems, and severity of use (Brodbeck, Matter, Page, & Moggi, 2007; Lee, Neighbors, Hendershot, & Grossbard, 2009; Simons, et al., 1998). Therefore, understanding motives for use among young people who use marijuana frequently is important for designing specific and effective interventions for harmful use.

Motivational models of substance use underscore the differences in substance use along two motivational dimensions, positive vs. negative affect regulation (e.g., drinking to enhance vs. drinking to cope; Cooper, Frone, Russell, & Mudar, 1995) and intrinsic (internal) vs. extrinsic (external) reasons for use (e.g., to cope vs. to conform). Consideration of both these dimensions has resulted in a four-factor model of reasons for alcohol use: enhancement, social, coping, and conformity motives (Cooper, et al., 1995). In light of the drug's perceptual effects, measures of reasons for using marijuana, as compared to alcohol, have added expanded experiential awareness (Simons, et al., 1998; Simons, Correia, & Carey, 2000) or altered perception (Lee, Neighbors, & Woods, 2007) as a distinct motive. Other empirically-derived reasons may also motivate marijuana use in certain populations (e.g., experimentation among college students; Lee, et al., 2007). Studies have noted distinct antecedents, correlates, and consequences of substance use for different types of motives for marijuana use (Bonn-Miller & Zvolensky, 2009; Lee, et al., 2007; Simons, et al., 1998; Zvolensky et al., 2007).

Most research on reasons for marijuana use have been assessed using qualitative lists of motives (e.g., what motivates you to use marijuana; Lee, et al., 2007) or frequency of using for particular motives (e.g., how often used for a given reason over all times used; Simons, et al., 1998). These assessments assume a "cross-situational consistency" (Cooper, et al., 1995) and consider motive type or frequency as a characteristic of the individual. However, individuals may use marijuana for different reasons at different times (Shrier, Walls, Rhoads, & Blood, 2013). Thus, reasons for using marijuana may also be considered a situational characteristic, influenced by conditions of the specific marijuana use event.

Importantly, nearly all studies have asked individuals to retrospectively report motives for marijuana use. Retrospective assessments may reflect salience of motives more so than likelihood or frequency (Piasecki, Richardson, & Smith, 2007). Recall of information pertaining to marijuana use is also subject to bias associated with the experience of the episode of use itself, intervening experiences, time elapsed since use, and method of data

collection (e.g., interview vs. self-administered survey and conditions of non-anonymity, which may result in socially desirable responding; Turner et al., 1998). In addition, cognitive reappraisal may result in reinterpreting motives for marijuana to attenuate a negative emotional response to the marijuana use, as has been suggested by research in cigarette smokers (Fucito, Juliano, & Toll, 2010).

Arguably, the optimal time to evaluate the event-specific reason an individual is using marijuana is just before that person is about to use. One approach to prospective event-level measurement is Ecological Momentary Assessment (EMA), a method of data collection that assesses thoughts, feelings, behaviors, and related environmental factors repeatedly in real time and in the natural environment (Shiffman, 2000). With EMA, internal experiences, such as reason for using marijuana, can be assessed in relation to specific behaviors, such as an episode of marijuana use (Shiffman, 2009). In this way, bias associated with recall can be minimized or eliminated and additional situational factors (e.g., social context) can be evaluated contemporaneously. In one EMA study, event-specific reasons for using marijuana assessed just before marijuana use were analyzed along with reasons assessed after use at random times and on daily diaries, thereby treating prospective and retrospective measures of reasons for use as equally valid (Buckner, Zvolensky, & Ecker, 2013). However, it is likely that reports of reason for use differ depending on whether the use event has occurred. In an EMA study of cigarette smoking, participants were asked to select from among eight motives as they began to smoke a particular cigarette (Piasecki, et al., 2007). Real-time reports of smoking to socialize were negatively related to scores on a smoking motives subscale identifying exposure to social/environmental smoking cues. This finding suggests that motives as a characteristic of the individual (“how true for me”) may not accurately reflect experienced reasons for episodes of substance use.

In sum, motivation for marijuana use precedes use, yet motives are typically assessed after use, introducing the potential for recall bias, and are often considered as individual characteristics, without accounting for factors related to a specific marijuana use event that may influence post-use reporting. Thus, we sought to evaluate whether, how, and under what conditions event-specific motives for using marijuana changed from before to after marijuana use. Specifically, the objectives of this study were to determine the frequencies with which different reasons for use changed from just before using marijuana to after the use event. We then sought to identify types of reason, characteristics of the marijuana use event, and characteristics of the individual that were associated with changing the reason for use.

2. Materials and Method

2.1. Participants

Participants were recruited from two adolescent/young adult medical clinics as part of a study of affective and social factors associated with marijuana use events (Shrier, et al., 2013; Shrier, Walls, Kendall, & Blood, 2012). To be eligible, clinic patients needed to be between 15 and 24 years of age and use marijuana at least two times per week. The affiliated hospital provided institutional review board approval, waiving parental consent for minors. A Certificate of Confidentiality was obtained from the National Institutes of Health.

Of the 44 patients enrolled, two were lost to follow-up, one did not provide any data, one did not report any use events, and four did not have complete data on reasons for use, resulting in 36 participants (82%) contributing data to the present analyses. Participant had a mean age of 18.6 years ($SD = 1.94$; 64% were 15 to 19 years of age). Just over one-half of the sample (53%) was female. More than one-third of participants (36%) reported using marijuana > 7 times per week, on average. Approximately two-thirds of participants (66%) met criteria for cannabis dependence (*Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, 1994*).

2.2 Procedures

Following informed consent, participants completed an audio computer-assisted self-interview (ACASI; QDS Software, Nova Research v. 2.1, Bethesda, MD) that assessed sociodemographic and psychological characteristics, and substance use history. Participants then used a handheld computer (Palm Tungsten E2) to complete a brief report immediately before and after each time they used marijuana for two weeks. Participants were also asked to complete a brief report several times a day when prompted by an auditory signal (response rate $M = 74\%$, $SD = 20\%$). The report included questions on recent marijuana use events. This duplicative reporting permitted collection of data following marijuana use if participants forgot to initiate a report just after using marijuana. Participants completed 3586 reports ($M = 99.6$ reports, $SD = 40.3$). At a follow-up visit, participants were remunerated up to \$140 depending on their signal response rate and study visit adherence.

2.3. Measures

2.3.1. Reasons for marijuana use—On the reports made just before using marijuana, participants reported the main reason they were about to use marijuana (for pleasure, to cope, to conform, to be more social, to expand my mind); *reason about to use marijuana* measure was adapted from the Marijuana Motives Measure (Simons, et al., 1998; Zvolensky, et al., 2007). In keeping with the domains identified in development of the original measure, we examined reasons as negative (cope, conform) versus positive (pleasure, social, expand) valence, and external (social, conform) versus internal (pleasure, cope, expand) locus, as well as the five types of motives. Expansion was thus included with positive reasons and with internal reasons, in addition to being a distinct category. On reports made following marijuana use, participants were asked to report the main reason that they had used the marijuana, using the same response options (*reason used marijuana*). The main outcome of interest was *change in reason for use* (yes, no), which was determined by examining agreement between “reason about to use marijuana” with “reason used marijuana” for each event.

2.3.2. Marijuana use event characteristics—On reports made after a marijuana use event, participants indicated whether they were alone when they used the marijuana and, if not, who their main companion was. For these analyses, *companionship* was analyzed as alone, friends (boyfriend/girlfriend, other friends), and other companions (parents, other family, other). Participants also reported their *location* when they were using the marijuana (home, friend’s house, school, work, other; the last three categories were reported relatively infrequently and were thus combined for the analyses). Participants indicated the main *way*

marijuana was used during the event (joint, blunt, bong, pipe, ate it, vaporizer, other; the last three categories were less frequent and were combined for analysis). *Dose* of marijuana was assessed with a question on how many hits of marijuana participants had during the event (1–5, 6–10, 11–15, 16–20 and 21 or more; responses were categorized into 1–5 vs. 6 or more hits). *High* from the marijuana use was assessed on a 9-point Likert-type scale from 0, Not at all high, to 8, Extremely high; a median split was used to categorize the responses as 0–5 vs. 6–8). Participants reported the date and time that they had used marijuana, which distinguished *weekend* (Friday 3 pm to Sunday 11:59 pm; Shrier, et al., 2013) from weekday use.

2.3.3. Individual characteristics—Participants were asked to indicate their *age* (in years; categorized as 15–19 years and 20–24 years) and *gender* (male, female). Using questions from the Adolescent Diagnostic Interview (Winters & Henly, 1993), *average weekly frequency of using marijuana* (number of times per week; categorized as 2–7 times versus 8 or more times per week) and *cannabis dependence* diagnosis were assessed.

Psychological characteristics and symptoms were assessed, including past-2-week positive and negative affect (Positive Affect-Negative Affect Schedule; Watson, Clark, & Tellegen, 1988), past-2-week depressive symptoms (Beck Depression Inventory-II; Beck, Steer, & Brown, 1996), social anxiety (Social Anxiety Scale for Adolescents; La Greca, 1999), and state and trait anxiety (State-Trait Anxiety Inventory; Spielberger, 1983). These scale scores were highly correlated, so we used latent-class analysis to identify individuals with *poor vs. good mental health* (Shrier, et al., 2013). More than one-fourth of the sample (28%) was thus classified as having poor mental health.

2.4. Data Analysis

We identified reports made about the same marijuana use event using the date and time of the report made just before using and the date and time of the event indicated on reports made post-use. Of 500 marijuana use events identified, reason about to use was reported for 385 (77%). Of these, reason for having just used was available for 263 events (68.3%), which comprised the analytic sample (median = 6 per participant, range = 1–34). The distributions of before and after reasons for use for the events not included in the analytic sample were similar to the reasons distributions for the analyzed events.

We first examined the frequency of each reason reported just before a marijuana use event and the proportion of these events for which participants reported the reason differently after use. Because researchers most commonly assess reasons for using marijuana retrospectively, we also examined frequency of each reason recalled after use had occurred and the proportion that was changed from another reason.

Descriptive statistics were computed for the reason types and the participant and event characteristics and are presented according to whether reason for use changed. Bivariate and multivariable associations with change in reason for use were analyzed with generalized linear mixed effects models (GLMMs). To provide clear comparisons between categories of reasons, reason for marijuana use was represented by valence (negative/positive), locus

(internal/external), and expansion. Analyses were conducted using SAS version 9.3 (SAS Institute, Cary, NC). The significance level was set *a priori* at 0.05.

3. Results

3.1. Distribution of prospectively-assessed reasons for marijuana use and proportion changed to another reason when recalled after use

Participants reported a different reason for using marijuana just before versus after 20% of marijuana use events (Table 1). Participants most frequently reported that they were about to use marijuana for pleasure (62% of all events). When participants reported that they were about to use marijuana for pleasure, they recalled a different reason following only 1 in 10 of these events. Participants next most frequently cited that they were about to use marijuana to cope (16%). When they reported that they were about to use marijuana to cope, they changed to a different reason following approximately one-fifth of these events. For 13% of events, participants reported that they were about to use marijuana to be more social. Following use, they changed their reason for more than one-third of these events. Participants reported that they were using marijuana to expand their mind before 8% of events. They reported a different reason following use for more than one-half of these events. Participants reported that they were about to use marijuana to conform for only three events (1%). Following use, they reported another reason for all of these events.

When we examined the reason for use recalled following a marijuana use event, we found that similar frequencies for each reason type were reported and similar proportions of each reason type were changed from another reason (data not shown). Participants endorsed having used marijuana for pleasure most frequently (62% of events) and they had change from another reason for use least frequently (10% events recalled as for pleasure). Participants recalled using to cope after 15% of events (18% of these events were changed from another reason), to be more social after 12% of events (31% of these events were changed from another reason), and for expansion after 10% of events (60% of these events were changed from another reason). Participants reported having used to conform the least frequently (2%, four events); for all of these events (100%), participants had reported another reason just before using marijuana.

3.2. Bivariate associations of reason type, event characteristics, and individual characteristics with change in reason for use

When participants reported that they were about to use marijuana for pleasure, they were least likely to change their reason to another reason when asked after use, compared to when they reported being about to use for any other reason (odds ratio [OR] 0.21, 95% confidence interval [CI] 0.11–0.41, $p < 0.0001$; Table 1). When they were about to use marijuana to be more social or to expand their mind, they were more likely to change their reason than when they reported another reason (OR 2.47, 95% CI 1.11–5.50, $p = 0.03$ and OR 5.84, 95% CI 1.32–14.7, $p = 0.0002$, respectively). Participants changed their reason from being about to use to conform to having used for another reason in every instance. However, because participants reported using to conform before only 3 events, the model predicting change in reason for use could not be fit.

We then examined the valence (positive-negative) and locus (internal-external) of motives for use. When participants reported that they were about to use marijuana for a negative reason (cope, conform), they changed their reason for use more frequently than when they were about to use marijuana for a positive reason, but the difference was not statistically significant (27% vs. 19%, OR 1.47, 95% CI 0.68–3.17, $p = 0.33$). When they reported being about to use marijuana for an external reason (social, conform), they were significantly more likely to change their reason for use than when they were about to use for an internal reason (41% vs. 17%, OR 3.39, 95% CI 1.57–7.30, $p = 0.002$).

With regard to characteristics of the use event, reason for marijuana use tended to change when use occurred on the weekend as opposed to a weekday, but the difference was not statistically significant (26% vs. 16%, OR 1.82, 95% CI 0.94–3.52, $p = 0.08$). Other characteristics of the marijuana use event were also not significantly associated with change in reason for use on bivariate analysis.

Older (age 20 to 24 years) versus younger (age 15 to 19 years) participants were more likely change their reasons for marijuana use (30% vs. 15%, OR 2.47, CI 1.33–4.57, $p = 0.001$). Other individual characteristics were not significantly associated with change in event-specific reason for use on bivariate analysis.

3.3 Multivariable model predicting change in reason for marijuana use

On multivariable analysis (Table 2), the odds of change in reason were higher if the reason before use was external (to be more social or to conform), compared to other reasons (adjusted odds ratio [AOR] 13.6, 95% CI 3.88–47.3, $p < 0.0001$) and if the reason before use was for expansion, compared to other reasons (AOR 12.1, 95% CI 2.83–51.7, $p = 0.001$). Use on the weekend was independently associated with greater odds of change in reason for use (AOR 4.30, 95% CI 1.72–10.7, $p = 0.002$). Older participants (age 20–24 years) were more likely than younger participants (age 15–19 years) to change their reason for using marijuana (AOR 2.71, 95% CI 1.05–7.02, $p = 0.04$). Males were almost 4 times as likely as females to change their event-specific reason for marijuana use (AOR 3.80, 95% CI 1.22–11.9, $p = 0.02$). Using a transformation to Cohen's effect size definitions that depends on the underlying prevalence of a predictor (Chen, Cohen, & Chen, 2010), the magnitude of the effects would be categorized as large (Cohen's $d > 0.8$) for all significant results except for age, which would be considered between medium and large (Cohen's $d = 0.6$).

4. Discussion

Applying motivational models to understanding and intervening on marijuana use requires valid and reliable measurement of marijuana use motives. Our results suggest that young people who use marijuana frequently may report a different reason for a specific marijuana use event depending on whether they are asked just before or after the event. We found that the reason reported before versus after marijuana use differed for a substantial proportion of marijuana use events (1 in 5 events). Youth most commonly changed their reason for use when they initially reported that they were about to use marijuana for an external reason (i.e., to be more social or to conform) or for expansion.

There are several pathways by which motives for marijuana use may be changed. First, marijuana affects cognitive processes and, in specific, may impair immediate recall (Heishman, Stitzer, & Yingling, 1989). As a result, participants may have recalled their reason inaccurately or simply may not have remembered why they used marijuana following the episode. Second, recollection of the motivation for use may be influenced by the experience of the use episode itself. For example, participants who felt relaxed after using marijuana may have been more likely to recall using to cope, whereas participants who experienced euphoria may have been more likely to recall using for expansion. Third, socially desirable responding may have resulted in underreporting of motives for use that might be perceived in a negative light. It is notable that conformity was reported as a motive for very few episodes and was completely unstable, always changing from or to another reason. Substance users with high scores on measures of socially desirable responding may underreport expressions of negative emotion (Welte & Russell, 1993). Fourth, in retrospect individuals may preferentially attribute their behavior to reasons under their control as a form of egocentric bias (Schachter, Gilbert, & Wegner, 2011), resulting in increased likelihood of changing an external motive for using marijuana. Future research is recommended to elucidate the role for these and other models in explaining why individuals change their event-specific motives for marijuana use.

The environmental context of a marijuana use episode may also influence whether individuals change their reason for use. We observed that reason for use was substantially more likely to change when participants used marijuana on the weekend, as opposed to the weekday. Weekend use may be associated with factors we did not analyze that can alter report of motives for using marijuana. For example, marijuana-using youth frequently use substances other than marijuana (Bonn-Miller & Zvolensky, 2009), such as alcohol, the use of which may be concentrated on the weekend (Larson, Csikszentmihalyi, & Freeman, 1984). Motives for using alcohol or other drugs may differ from motives for using marijuana (Simons, et al., 2000). It is possible that participants confused or altered motives as a result of using more than one substance contemporaneously. Weekend time also tends to be less structured and more discretionary in adolescence (Larson & Richards, 1998), which may contribute to looser or more fluid recall of motives for marijuana use.

Individual characteristics also predicted changing reason for use from before to after a use event, with young adults and males being more likely to change their reason in this study. Why young people use marijuana changes with age, with most reasons decreasing in prevalence from the ages of 18 to 30, except to get high, to relax, and to decrease the effects of other drugs (Patrick et al., 2011). However, we are not aware of research that has examined age-related changes in event-specific motive for use, adjusted for motive type. One possible mechanism for the findings is that, owing to cognitive maturation, young adults may be more likely than adolescents to re-evaluate their motives in light of intervening experiences (i.e., the use event itself and subsequent intoxication). Young men tend to have shorter use episodes compared to young women (Shrier et al., 2013); duration of the episode or other characteristics of use not examined in this study may influence reason stability or recall. In addition, there may be differences in the interpretation of motives measures between age groups and between genders. In general, studies developing motives measures have not considered age and gender differences in reliability and validity

when reporting differences in motive prevalence and associations with substance use behaviors and outcomes (Simons et al., 1998), if these differences are examined at all (Lee et al., 2009). Further research into possible mechanisms for the observed age and gender associations should examine both theoretical and methodological models for why marijuana use motives may change from before to after use.

Participants reported that they were about to use marijuana for pleasure most frequently, consistent with retrospective research in college students (Lee, et al., 2009). In our study, pleasure was also the most stable motive, with a different reason being reported retrospectively in only 1 in 10 events for pleasure. Enhancement motives have been associated with increased use (Lee, et al., 2007; Simons, et al., 1998) and thus using frequently for pleasure may reinforce use over time and be part of an ingrained pattern of use.

Participants reported using for social, expansion, and conformity reasons relatively infrequently (13%, 8%, and 1% of events, respectively). This sample of experienced users may consider their marijuana use a lifestyle choice (Osborne & Fogel, 2008) and thus less reactive to the external influence of specific social situations compared to lighter users (Lee, et al., 2009). Further, much of the research on motives for marijuana use in young people who use heavily has been among college students (Buckner, 2013; Buckner et al., 2011), for whom social contexts and norms may be strongly related to marijuana use (Buckner, 2013).

Coping was the second most frequently cited motive for a specific episode of marijuana and, as with pleasure, was relatively infrequently changed to another reason when assessed after use. Anxiety (Buckner, Crosby, Silgado, Wonderlich, & Schmidt, 2012) and negative affect in general (Shrier, Blood, & Ross, In press) predict episodes of marijuana use and thus youth may recognize that they are using to cope. In heavy users, using marijuana to cope with negative feelings may be part of an established affect management strategy (Buckner, 2013; Buckner, et al., 2013) and predictive of problems related to marijuana use (Buckner, 2013; Buckner, Bonn-Miller, Zvolensky, & Schmidt, 2007; Lee, et al., 2009). Difficulties associated with use may exacerbate negative affect, motivating further marijuana use to cope, as has been suggested for co-morbid anxiety and substance use disorders (Stewart & Conrod, 2008).

The results of this study must be considered in light of several limitations. The small sample of participants was recruited from medical clinics, leaving open questions about generalizability of the findings to other populations of young people using marijuana, such as undergraduates (Buckner, 2013) and self-referred community members (Buckner, et al., 2013). In addition, reporting of reasons using the same questions before and after use means that the association between the two are subject to common method variance, possibly inflating the association between before and after reasons, which would result in a biased estimate of proportion of events on which disagreement occurred. We did not assess motives outside of the types in the Marijuana Motives Measure (Simons, et al., 1998). Some motives not ascertained, such as boredom, may be important among heavily-using youth, whereas other motives, such experimentation and availability, may not be as relevant to our population (Lee, et al., 2009). It will be important that future research determine the

prevalence and stability of a broader array of motives for marijuana use for these high-risk youth. Although the distributions of reasons before and after events were similar between the analyzed and excluded events, the sample of use events for which participants made a report both before and after use comprised a subset of all events reported. It is possible that participants did not report on an impending event, or report on an event at all, in a non-random fashion. Conducting retrospective assessments for missed events will be useful for determining representativeness of event samples in future studies.

As in other self-report studies, our findings may have been influenced by measurement biases such as socially desirable responding and assessment reactivity (Barta, Tennen, & Litt, 2012). Although participants may have altered their reason for use to provide a more socially desirable response, the more sensitive issue was the marijuana use behavior, which participants had already reported to get to the question on the reason for use. Socially desirable responding effects may be attenuated with repeated sampling owing to habituation to being asked sensitive questions and providing responses without experiencing consequences (Barta, et al., 2012). We would expect that reactivity effects would be similar before and after marijuana use and thus would not explain discrepancies between reason for the same use event reported at different times. Reactivity to self-monitoring is reduced when, as in this study, previous records cannot be reviewed, multiple states and behaviors are being monitored, and demand for behavior change is minimized or, as in this case, not present (Barta, et al., 2012).

Accurate and reliable measurement of motives for marijuana use is essential for testing motivational models of substance use and developing interventions that target specific motives. Low reliability can compromise the validity of motives measures and attenuate observed associations with marijuana use outcomes. In contrast to previous research, we evaluated reliability of motivation for marijuana use against a criterion standard, motive reported when just about to use, as opposed to testing internal consistency reliability (Mueser, Nishith, Tracy, DeGirolamo, & Molinaro, 1995; Simons, et al., 1998). Further, we examined motives at the event level, permitting examination of situational factors influencing change in reason for using marijuana. Of note, the prevalence of each type of motive for marijuana use did not differ substantially between assessments made just before using and those made after using marijuana. As such, retrospective assessments may not result in inaccurate estimates of the prevalence of motives for use, but rather event-specific misclassification.

Research in motivations for marijuana use will benefit from designs that permit prospective assessment of use motives and include assessments of factors that can provide convergent validation of motives, such as social situation (e.g., use to be more social would be expected to occur in the presence of companions) and emotional state (e.g., use to cope would be expected to occur when an individual is experiencing increased negative affect). Interventions centering on particular reasons, such as coping, can thus be appropriately responsive to the context of the motivation to use marijuana.

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Highlights

- We compared motive for marijuana use before versus after use events.
- We determined factors that predicted change in motive.
- Motive for marijuana use changed in 20% of use events.
- Motives that were external or for expansion were more likely to change.
- Older age, male gender, and weekend use were also associated with motive change.

Reasons for marijuana use, marijuana use event characteristics, and individual characteristics, total and by reason changed following the marijuana use event

Table 1

Characteristic	Total Events N	Reason Changed n (%)	β (SE)	OR (95% CI)	p
<i>Reason about to use marijuana</i>					
Type of reason	263	53 (20%)			
For pleasure	162	17 (10%)	-1.55 (0.33)	0.21 (0.11–0.41)	<0.0001
To cope	42	9 (21%)	-0.16 (0.45)	0.86 (0.35–2.08)	0.73
To be more social	34	12 (35%)	0.90 (0.41)	2.47 (1.11–5.50)	0.03
To expand my mind	22	12 (55%)	1.76 (0.47)	5.84 (2.32–14.7)	0.0002
To conform	3	3 (100%)	-	-	-
Valence of reason					
Negative	45	12 (27%)	0.38 (0.39)	1.47 (0.68–3.17)	0.33
Positive	218	41 (19%)			
Locus of reason					
External	37	15 (41%)	1.22 (0.39)	3.39 (1.57–7.30)	0.002
Internal	226	38 (17%)			
<i>Marijuana use event</i>					
Companionship					
Alone	65	12 (18%)	-0.79 (0.50)	0.45 (0.17–1.21)	0.18
Friends	132	23 (17%)	-0.77 (0.45)	0.46 (0.19–1.12)	0.11
Other people (referent)	37	11 (30%)			0.09
Location					
Home (referent)	133	26 (20%)			0.92
Friend's house	59	11 (19%)	0.02 (0.41)	1.02 (0.43–2.29)	0.96
Other place	42	9 (21%)	0.18 (0.44)	1.19 (0.50–2.86)	0.69
Time of day					
Afternoon	80	13 (16%)	-0.63 (0.66)	0.53 (0.14–1.95)	0.13
Evening	103	17 (17%)	-0.61 (0.64)	0.54 (0.1–1.80)	0.34
Early morning	36	12 (33%)	0.31 (0.68)	1.36 (0.35–5.25)	0.65
Morning (referent)	15	4 (27%)			

Characteristic	Total Events N	Reason Changed n (%)	β (SE)	OR (95% CI)	p
Time of week					
Weekend	85	22 (26%)	0.60 (0.33)	1.82 (0.94–3.52)	0.08
Weekday	149	24 (16%)			
Way marijuana used					
Blunt	142	27 (19%)	0.39 (0.60)	1.48 (0.45–4.83)	0.51
Bong	38	8 (21%)	0.75 (0.70)	2.13 (0.53–8.47)	0.28
Pipe (referent)	31	4 (13%)			
Other	23	7 (30%)	1.12 (0.72)	3.05 (0.74–12.6)	0.12
Dose of marijuana					
1–5 hits	43	10 (23%)			
6 or more hits	191	36 (19%)	–0.29 (0.31)	0.75 (0.33–1.70)	0.49
Level of high (0–8 scale)					
Median or below (0–5)	138	30 (22%)			
Above median (6–8)	95	15 (16%)	0.49 (0.36)	1.61 (0.79–3.30)	0.19
Individual					
Age					
15–19 years	165	24 (15%)			
20–24 years	98	29 (30%)	0.90 (0.31)	2.47 (1.33–4.47)	0.001
Gender					
Female	168	29 (17%)			
Male	95	24 (25%)	0.46 (0.32)	1.59 (0.85–2.98)	0.15
Average weekly marijuana use					
2–7 times	131	27 (21%)			
8 or more	132	26 (20%)	–0.09 (0.35)	0.91 (0.46–1.81)	0.79
Mental health					
Good	203	43 (21%)			
Poor	60	10 (17%)	–0.29 (0.41)	0.75 (0.33–1.69)	0.49
Cannabis dependence					
No	88	21 (24%)			
Yes	169	29 (17%)	–0.49 (0.33)	0.68 (0.35–1.32)	0.26

Note. $N = 233$ – 263 marijuana use events, owing to missing data. 36 participants contributed events. SE = standard error. OR = odds ratio. CI = confidence interval. Negative reason for marijuana use defined as to cope or to conform. External reason for marijuana use defined as to be more social or to conform. Mental health categories determined on latent class analysis of responses to validated scales assessing depressive symptoms, state and trait anxiety, social anxiety, and positive and negative affect.

Table 2

Multivariable model predicting change in event-specific reason for using marijuana

Predictor	β (SE)	AOR (95% CI)	<i>p</i>
<i>Reason about to use marijuana</i>			
Negative reason vs. other	0.85 (0.57)	2.34 (0.76–7.25)	0.14
External reason vs. other	2.61 (0.63)	13.6 (3.88–47.3)	<.0001
To expand my mind vs. other	2.49 (0.74)	12.1 (2.76–57.6)	0.001
<i>Marijuana use event</i>			
Companionship			0.62
Location			0.58
Time of day			
Weekend (vs. weekday)	1.46 (0.46)	4.30 (1.72–10.7)	0.002
Way marijuana used			0.14
Higher dose (6 or more vs. 1–5 hits)	−0.21 (0.60)	0.81 (0.25–2.67)	0.73
Higher high (above median)	−0.76 (0.48)	0.47 (0.18–1.21)	0.12
<i>Individual</i>			
Older age (20–24 vs. 15–19 years)	1.00 (0.48)	2.71 (1.05–7.02)	0.04
Male gender	1.34 (0.58)	3.80 (1.22–11.9)	0.02
More frequent average weekly use (8 or more vs. 2–7 times)	−0.37 (0.55)	0.69 (0.23–2.02)	0.50
Poor mental health	−1.01 (0.70)	0.37 (0.09–1.45)	0.15
Cannabis dependence	0.59 (0.62)	1.81 (0.53–6.19)	0.34

Note. Data from 231 marijuana events in 36 youth. Negative reasons included to cope and to conform. External reasons for marijuana use included to be more social and to conform. SE = standard error. AOR = adjusted odds ratio. CI = confidence interval.