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Daily associations between cannabis motives and consumption in emerging adults

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ABSTRACT

Background: Increasing rates of cannabis use among emerging adults is a growing public health problem. Intensive longitudinal data can provide information on proximal motives for cannabis use, which can inform interventions to reduce use among emerging adults.

Method: As part of a larger longitudinal study, patients aged 18–25 years ($N = 95$) recruited from an urban Emergency Department completed daily text message assessments of risk behaviors for 28 days, including daily cannabis quantity and motives. Using a mixed effects linear regression model, we examined the relationships between daily quantity of cannabis consumed and motives (i.e., enhancement, social, conformity, coping, and expansion).

Results: Participants were, on average, 22.0 years old (SD = 2.2); 48.4% were male, 45.3% were African American, and 56.8% received public assistance. Results from the multi-level analysis (clustering day within individual), controlling for gender, race, and receipt of public assistance, indicated daily use of cannabis use for enhancement ($\beta = 0.27$), coping ($\beta = 0.15$), and/or social motives ($\beta = 0.34$) was significantly associated with higher quantities of daily cannabis use; whereas expansion and conformity motives were not.

Conclusions: Daily data show that emerging adults who use cannabis for enhancement, social, and coping motives reported using greater quantities of cannabis. Future research should examine more comprehensive cannabis motives (e.g., boredom, social anxiety, sleep) and test tailored interventions focusing on alternative cognitive/behavioral strategies to address cannabis motives.

1. Introduction

Cannabis is the most frequently used substance of abuse other than alcohol and tobacco (Center for Behavioral Health Statistics and Quality, 2016). Cannabis is associated with many individual and public health consequences (Silins et al., 2014; Volkow et al., 2016). Recent U.S. state legislation has increased legal access to cannabis, shifting the national context surrounding cannabis use. Daily consumption and perceived approval of cannabis use are increasing while perceived risk is decreasing, particularly among young people (Azofeifa et al., 2016; Johnston et al., 2016). Emerging adults (usually ages 18–25 years) comprise the age group with the highest lifetime (46.9%), past-year (13.6%), and past-month (8.4%) prevalence of cannabis use (Center for Behavioral Health Statistics and Quality, 2016) and cannabis use disorders (Hasin et al., 2015). Emerging adults in urban areas are of particular concern given that urban versus rural areas have a higher prevalence of cannabis use and cannabis use disorders (Hasin et al., 2015). To inform policy and interventions, we need a deeper understanding of the determinants of cannabis use among emerging adults. Individual data captured daily or at the event-level can provide needed detail on proximal factors influencing cannabis use. Such data may prove useful in developing personalized, tailored, and/or just-in-time adaptive

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interventions (Nahum-Shani et al., 2016) to reduce cannabis consumption and negative consequences.

Although many factors across levels of social ecology influence substance use (Abadi et al., 2011; Keyes et al., 2011; Sallis et al., 2008; Tang and Orwin, 2009), motives (i.e., reasons for use) are an important individual-level characteristic because they are related to negative consequences (Blevins et al., 2016b; Lee et al., 2009), including developing cannabis use disorders (Benschop et al., 2015; Schlossarek et al., 2016). Motives may change as a result of cannabis interventions; in prior work, reductions in motives (particularly coping-related motives) predicted post-intervention reductions in consumption and consequences (Blevins et al., 2016a), underscoring the need to examine how cannabis-related motives affect consumption. Models of cannabis use motives were originally adapted from models of alcohol motives (Cooper, 1994; Cooper et al., 1995), and were characterized in five domains: enhancement (e.g., enjoyment), coping (e.g., reducing negative affect), social (e.g., making a social event more enjoyable), expansion (e.g., altering perceptual awareness), or conformity (e.g., fitting in) (Simons et al., 1998). Researchers later expanded cannabis motives to include others such as relaxation, social anxiety, and sleep (Lee et al., 2009; Lee et al., 2007).

In cross-sectional data, young people's motives for cannabis use are associated with cannabis consumption, severity, and consequences, and other psychosocial outcomes (Benschop et al., 2015; Bonn-Miller et al., 2014; Bonn-Miller and Zvolensky, 2009a, 2009b; Bravo et al., 2017; Farris et al., 2016; Simons et al., 1998; Zvolensky et al., 2007). Among young adults, when adjusting for gender, age of cannabis initiation, and other substance use, greater enhancement and social motives positively correlated with recent cannabis use while conformity was negatively related to consumption (Zvolensky et al., 2007). In this same sample, higher coping motives were related to lower positive affect and higher negative affect, anxiety sensitivity, anxious arousal, and depression symptoms. Other motives were less consistently associated with outcomes: enhancement was positively associated with positive affect and negatively associated with anxious arousal and depression symptoms, whereas conformity was positively correlated with negative affect, and no relationships were observed for expansion or social motives. Among college students who used cannabis at least once in the previous month, social, coping, expansion, and enhancement motives positively correlated with frequency of cannabis use over the month, whereas conformity was non-significant (Bravo et al., 2017). Using the expanded motives list among high school students using cannabis regularly, coping motives were positively related to externalizing (Blevins et al., 2016b) and higher coping, alcohol-related, and availability motives, along with lower celebration motives were associated with stronger internalizing (Blevins et al., 2016b). Among Dutch young adults using cannabis regularly, motives regarding routine use (i.e., boredom, habit) and coping were related to cannabis dependence (Benschop et al., 2015). Data from other young adults found that those meeting criteria for cannabis dependence had higher levels of all five original motives dimensions than those not meeting criteria (Bonn-Miller and Zvolensky, 2009b).

Although cannabis use motives are generally correlated with consumption and other outcomes in cross-sectional research, motives are conceptualized as situational reasons for use that are expected to vary across time and contexts (Cooper, 1994). For example, event-level research demonstrated that perceived motivation for cannabis use can differ when measured just before and after consumption (Shrier and Scherer, 2014). Further, among high school students, motives for use changed across the course of a multi-session intervention, and such changes were predictive of treatment outcomes for up to 15 months, but were not measured at the daily level (Blevins et al., 2016a).

Because of their changing nature, motives may be more accurately captured with event or daily-level methods, but few researchers have evaluated specific acute associations between motives and amount consumed. For example, ecological momentary assessment (EMA) data of young people's cannabis use indicated that 86% of use events involved enhancement, expansion, or social motives and 14% involved coping or conformity motives, but these motives were not associated with more hits consumed (Shrier et al., 2013). In a diverse community sample, primarily comprising college students, using EMAs over two weeks, most cannabis use episodes involved enhancement motives (77.7%), followed by coping (62.7%), expansion (22.8%), social (17.7%), and conformity (2.8%) (Buckner et al., 2015). Together, these studies (Buckner et al., 2015; Shrier et al., 2013) demonstrate that individuals can have multiple, simultaneous motives for acute cannabis use, but relationships between motives and level of consumption within days or events are under-investigated. Further, EMA data also suggest that acute motives relate to other contextual factors associated with cannabis use, such as withdrawal symptoms and negative affect (Buckner et al., 2015). Given that previous EMA studies demonstrate relationships between anxiety and cannabis craving and use, motives related to coping with negative affect may play an important role in determining acute consumption, at least for some individuals (Buckner et al., 2012; Buckner et al., 2011).

Although these previous studies provide a useful foundation for understanding daily motives and cannabis use, in the present study, we begin to address gaps in the literature by examining daily data collected via text messaging from a sample of emerging adults recruited from an urban healthcare setting. Most literature examining cannabis motives has focused on school samples, in particular college students, or medical cannabis patients, with limited attention to urban populations with higher prevalence. Further, previous research has often been cross-sectional in nature and lacks information on how motives influence *quantity* consumed using more fine-grained longitudinal approaches. Specifically, we examine daily relationships between perceived influence of five motive types and quantity of cannabis consumed. We hypothesized that, in general, higher motives would be associated with higher consumption at the daily level, but had no specific hypotheses about which motives would be more strongly associated with daily consumption, because few researchers have evaluated simultaneous relationships between motives and acute consumption at the daily level.

2. Method

2.1. Study setting

From November 2014 through September 2015, we recruited emerging adults from the Emergency Department (ED) at Hurley Medical Center, a Level-One trauma center in urban Flint, Michigan. This mid-sized city has poverty and crime rates similar to other mid-size rust belt cities (U.S. Census Bureau, 2015a, b, c, d, e). We recruited from the ED because emerging adults attending EDs often have elevated rates of substance use and other risky behaviors (Bonar et al., 2016; Cunningham et al., 2006; Walton et al., 2011; Wilson and Klein, 2000). The Institutional Review Boards at both Hurley Medical Center and the University of Michigan approved the research, and a Certificate of Confidentiality was obtained from the National Institutes of Health.

2.2. Participants

Patients ages 18–25 years attending the ED were eligible for screening for a longitudinal 28-day survey study of substance use and sexual behaviors. We excluded patients from screening based on these criteria: insufficient cognition or physical/medical state that would preclude ability to provide informed consent, presenting for care involving intensive ED-based social work intervention (e.g., suicidality, acute sexual assault), having a live-in partner already participating in the study, significant hearing/visual impairment, illiteracy and/or inability to communicate in English, or enrolled in another longitudinal study.

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