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Marijuana Use, Marijuana Expectancies, and Hypersexuality among College Students

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Abstract

Research supports links between marijuana effect expectancies and risky sexual behaviors among marijuana users, but associations between marijuana expectancies and hypersexuality have yet to be investigated. The current study examined links between marijuana lifetime use and hypersexuality among university students. A hierarchical regression adjusting for gender and alcohol use was used to determine the degree to which marijuana use and expectancies accounted for variance in hypersexuality. Marijuana lifetime use and hypersexuality were significantly and positive related. After adjusting for covariates, perceptual and cognitive enhancement expectancies positively correlated with hypersexuality, while tension reduction and relaxation expectancies negatively correlated with hypersexuality.

Keywords

Hypersexuality; marijuana effect expectancies; college students

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Introduction

Hypersexuality is characterized by sexual behavior, preoccupations, and urges that persist despite repeated and prolonged attempts to control or decrease the amount of time spent engaging in sexual acts (Kafka, 2010). This behavior differs from mere risky sexual practices in its compulsivity, use of sex as coping, and greater adverse psychological effects. Estimates of hypersexuality have been reported in the range of 3–6% of U.S. adults (Garcia & Thibaut, 2010), although exact rates remain unclear (Kraus, Voon, & Potenza, 2016). Research has underscored the importance of examining risky sexual practices, such as unprotected sex among college samples (e.g. Walsh, Fielder, Carey, & Carey, 2014), but much less work has looked at hypersexuality in this population, even though difficulties controlling sexual behavior often develop between the ages of 20–30 years (Goodman, 1997).

Hypersexuality has been found to frequently co-occur with substance-use disorders (e.g., alcohol), including cannabis use disorders (CUDs), in clinical samples of both behaviors (Kraus, Potenza, Martino, & Grant, 2015; Raymond, Coleman, & Miner, 2003; Stavro et al., 2013). Research with non-clinical samples indicate that problematic sexual behaviors and marijuana (MJ) use both become more common as students transition from high school to college (Fromme, Corbin, & Kruse, 2008), with CUD being the second most frequently cited reason for university students to enter substance abuse treatment (Arria et al., 2008). Prevalence estimates for hypersexuality in college students are less precise due to its scarcity of assessment in this population, but recent work has found estimates of up to 3.0% for men and 1.2% for women (Odlaug et al., 2013).

Several theories attempt to connect MJ use and risky sexual behavior, including common personality factors related to sensation-seeking and impulsive decision-making (Donohew et al., 2000), as well as potential effects of delta-9-tetrahydrocannabinol (THC), the active physiological ingredient in MJ, on memory, inhibition, and decision-making (Lane, Cherek, Tcheremissine, Lieving, & Pietras, 2005). More recently, research supports the role of individuals' beliefs about the effects of MJ (particularly sexually related effects) on these associations (e.g. Kingree & Thompson, 2007; Hendershot et al., 2010). A study of juvenile detainees found that stronger beliefs that MJ enhanced sexual experience statistically predicted MJ use during last sexual intercourse (Kingree & Thompson, 2007). Another study of high-risk adolescents found an association between MJ use and decreased likelihood of condom use that was moderated by sex-related MJ expectancies (Hendershot et al., 2010). Individuals with high expectancies related to sexual risk and disinhibition were approximately half as likely to report using a condom compared to those who did not have these expectancies. This work helps provides a basis for assessing MJ use, MJ effect expectancies, and hypersexuality among college students, which has yet to be explored.

Current Study

We examined associations between MJ use and hypersexuality in a college sample, and sought to determine the degree to which frequency of marijuana use and expectancies account for variance in hypersexuality among lifetime users. Based on prior work (e.g.

Hendershot et al., 2010; Kraus et al., 2015), we hypothesized that MJ use would be positively associated with hypersexuality among college students. Among MJ lifetime users, we hypothesized that MJ expectancies related to social and sexual facilitation would explain significant variance in hypersexuality, after adjusting for the effects of gender and alcohol use frequency.

Method

Participants and Procedures

Data for the current analyses were drawn from a larger study of 228 (see Sartor et al., 2017 for details of sample ascertainment). Our sample consisted of undergraduates recruited from two northeastern universities (one all-female) via in-class and on-campus advertisements for a study of health behaviors and substance use. Students were invited to participate in the online survey if they were at least 18 years of age, enrolled in a Psychology or Human Sexuality course, and able to read English and provide informed consent. Six-hundred-and-ten students (400 at Site 1 and 210 at Site 2) were invited to participate. Course credit was provided as compensation. Of the 270 students who accessed the survey, 52 were excluded due to missing data on the two major variables of interest (HBI and MJ use ever), resulting in a final sample size of 221. Of the 221 participants, 137 (62%) individuals who reported MJ lifetime use were included in subsequent analyses. See Table 1 for sample demographics.

Measures

Lifetime MJ use.

Lifetime MJ use was queried with the question, “How old were you when you first used MJ?.” Individuals who endorsed ‘I have never used MJ in my life.’ were categorized as non-users.

Frequency of MJ and alcohol use in the past three months.

MJ use was assessed by the Marijuana Use Form (Buckner & Schmidt, 2008) using a scale of 0 (<once/month, including not at all) to 11 (≥ 21 times/week). Due to the skewness of the distribution (skew=1.47), we collapsed frequency into a 4-level variable (approximately quartiles), consistent with prior work with this sample (Sartor et al., 2017). This technique substantially improved skew (skew= 0.28): <once/month, once/ month, 2–3 times/month, and once/week. See Table 2 for descriptive statistics of all study variables.

Frequency of alcohol use in the past three months.

Alcohol use was assessed using the Alcohol Use Disorders Identification Test (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) using a scale of 0 (never) to 11 (everyday).

MJ expectancies.

MJ expectancies were assessed with the Marijuana Effect Expectancy Questionnaire (MEEQ); this scale has been found to have good internal consistency, reliability, and convergent validity in both clinical and non-clinical samples (Aarons, Brown, Stice, & Coe,

2001; Schafer & Brown, 1991). It assesses six domains of individuals' expectancies regarding the acute effect of MJ use ranging in valence from negative to positive (Schafer & Brown, 1991). Two negatively valenced subscales assess cognitive and behavioral impairment, (e.g., "Marijuana slows thinking and actions") and global negative effects (e.g., "After the 'high' of marijuana, I feel down"), while one neutral subscale assesses craving and physical effects (e.g. "Smoking marijuana increases my cravings for things"). Three positively valenced subscales measure relaxation and tension reduction (e.g., "I get a sense of relaxation from smoking marijuana"), social-sexual facilitation (e.g., "I have a better time at parties when I smoke marijuana"), and perceptual and cognitive enhancement (e.g., "Marijuana makes small things seem intensely interesting"). Among the positively valenced subscales, two (social-sexual facilitation and perceptual and cognitive enhancement) are positively reinforcing (i.e., regarding enhancing a pleasant experience), and one (relaxation and tension reduction) is negatively reinforcing (i.e., decreasing a negative experience). Items are rated on a Likert scale from 1 (disagree strongly) to 5 (agree strongly).

Hypersexual Behavior Inventory (HBI).

Hypersexuality was assessed with the Hypersexual Behavior Inventory, a 19-item assessment that measures (1) control over sexual thoughts, urges, and behavior, (2) negative consequences, and (3) the extent to which an individual uses sex to cope with negative affect (Reid, Garos, & Carpenter, 2011). The HBI Total is scored on a 5-point Likert scale ranging from 1 (Never) to 5 (Very Often) with possible scores ranging from 19 to 95 with 53 regarded as the threshold for hypersexuality. The HBI has been shown to have a high validity and reliability in clinical samples (Reid, Carpenter, & Lloyd, 2009) and non-clinical samples (Yeagley, Hickok, & Bauermeister, 2013).

Data Analysis

An independent samples *t*-test was first performed on the entire sample ($n=221$) to examine the association between MJ lifetime use and hypersexuality. Next, bivariate associations between study variables were examined among MJ lifetime users ($n=137$). Third, a hierarchical stepwise regression analysis adjusting for gender and alcohol use was performed to determine the amount of variance in hypersexuality explained by frequency of use and MJ expectancies among MJ users.

Results

Associations between Variables

Hypersexuality was positively skewed (skew= 1.50), so a box-cox transformation ($\lambda = -0.1$) was performed that substantially improved skew (0.08). All variables were median-centered prior to analyses. Greater hypersexuality was found in lifetime MJ users ($M=0.04$, $SD=1.16$) versus non-users ($M=-0.38$, $SD=1.12$); $t(220)=3.03$, $p<0.01$. One hundred and thirty-seven participants were categorized as positive for lifetime use and were included in analyses described below. Bivariate correlations revealed significant correlations between MJ use frequency and MJ expectancies of relaxation, social-sexual facilitation, cognitive and perceptual enhancement, and craving and physical effects. In addition, hypersexuality was significantly correlated with MJ expectancies of social-sexual facilitation, cognitive and

perceptual enhancement, craving and physical effects, global negative effects, and cognitive and behavioral impairment. See Table 3 for bivariate correlations among expectancies.

Regression Analysis

As shown in Table 4, the regression analysis was significant, $F(3,135) = 8.14, p < .01$. Perceptual and cognitive enhancement expectancies positively correlated with hypersexuality, while tension reduction and relaxation expectancies negatively correlated with hypersexuality.

Discussion

Hypersexuality and MJ Use

Our study found preliminary evidence for a relationship between MJ lifetime use and hypersexuality. This study extends links from clinical populations (Raymond et al., 2003; Stavro et al., 2013) to a university sample. Overlapping features exist between hypersexuality and SUDs, including common neurotransmitter systems, attentional biases, and similar neuroimaging responses in regard to craving (Kraus, Voon, & Potenza, 2016). Nevertheless, past three-month frequency of use was not significantly associated with hypersexuality among MJ users. These nonsignificant associations may be unique to university samples, where MJ use may be more widely prevalent than the population at large (Meich, Johnston, O'Malley, Bachman, & Schulenberg, 2015). Thus, as MJ use may be deemed more “normative” on college campuses, a wider array of individuals may engage in frequent use who do not engage in other problematic behaviors including hypersexuality, although this speculation warrants direct examination.

MJ Expectancies and Hypersexuality

Counter to our hypothesis, social-sexual facilitation expectancies did not statistically predict hypersexuality in the regression equation. A potential reason for this finding is that the subscale does not explicitly query sex, but instead asks individuals about feeling more “romantic” or “attracted” to others, or queries about social situations such as, “Marijuana makes me talk more than usual”. To our knowledge, this is the first study to examine the relationship between MJ effect expectancies with hypersexuality, and so the absence of a significant link between this expectancy and hypersexuality among MJ users requires further exploration. Perceptual and cognitive enhancement expectancies positively correlated with hypersexuality. A question on this subscale explicitly states, “I feel sexy or more interested in having sex after smoking marijuana.” It is likely that marijuana users who endorse this view may also report higher scores of hypersexuality. Tension reduction and relaxation expectancies negatively correlated with hypersexuality. Thus, college MJ users with positively reinforcing MJ expectancies such as perceptual and cognitive enhancement, may be more likely to endorse hypersexuality than those with negatively reinforcing expectancies, such as tension reduction and relaxation. The association between perceptual and cognitive enhancement and hypersexuality is consistent with research indicating common underlying traits of impulsivity and sensation seeking for both risky sexual behavior and problematic MJ use (e.g. Donohew et al., 2000).

As impulsive tendencies may represent a common vulnerability marker for the development of these disorders, the particular subset of individuals who engage in both behaviors may more commonly endorse positively reinforcing expectancies than negatively reinforcing expectancies toward MJ.

Limitations

The sample size of individuals reporting lifetime MJ use is relatively small ($n=137$) leading to power limitations. HBI mean scores were also well below the standard threshold of 53 for identifying clinically significant problems so conclusions cannot be drawn regarding problem levels of hypersexuality. This study consisted of mostly white women attending colleges in the northeast; thus, findings may not generalize to more diverse samples, or different locations (e.g., Colorado) with more liberal MJ laws.

Future directions

This study on MJ use, MJ effect expectancies, and hypersexuality in college students lays the foundation for future research on these topics. Larger scale studies with general population-based samples, as well as longitudinal designs can help provide further support for these findings and identify the directions of these influences. Research should further explore the prospective relations between hypersexuality with higher positively reinforcing MJ expectancies and lower negatively reinforcing MJ expectancies among MJ users. Such work can help inform prevention and treatment strategies that target MJ use and hypersexuality before they reach problematic levels.

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Table 1.

Characteristics of Study Sample

	Total		MJ users	
	n=221	%	n=137	%
Gender				
Male	38	17.2	27	19.7
Female	183	82.8	110	80.3
Race				
White	143	64.7	90	65.7
Black	19	8.8	14	10.2
Asian	21	9.3	6	4.4
Multi-racial	21	9.3	14	10.2
Other	17	7.9	13	9.5

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Table 2.

Descriptives of MJ use, hypersexuality, and MJ effect expectancies

Variable	Mean	SD	Maximum Possible Value	Cronbach's Alpha
1 MJ Use Frequency (Past 3 Months)	2.28	1.22	3	-
2. Alc use Frequency (Past 3 Months)	5.94	2.31	11	-
2. Hypersexuality	29.00	13.47	95	0.96
3. Marijuana Effect Expectancy Total	88.12	40.90	240	0.97
3. Expectancy_Relaxation	16.10	9.16	40	0.95
4. Expectancy_Social-Sexual	14.16	6.21	45	0.71
5. Expectancy_Perceptual & Cognitive Enhance	14.30	8.08	40	0.91
6. Expectancy_Craving & Physical Effects	13.64	7.02	30	0.93
7. Expectancy_Global Negative	11.32	8.26	45	0.91
8. Expectancy_Cognitive & Behavioral Impair	18.60	9.67	50	0.91

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Table 3.

Correlations (r) between MJ use, hypersexuality, and MJ effect expectancies

Variable	1.	2.	3.	4.	5.	6.	7.
1 MJ Use Frequency (Past 3 Months)							
2. Hypersexuality	.04						
3. Expectancy_Relaxation	.29**	.16					
4. Expectancy_Social-Sexual	.29**	.18*	.73**				
5. Expectancy_Cognitive & Perceptual Enhance	.32**	.31**	.81**	.70**			
6. Expectancy_Craving & Physical Effects	.18*	.17*	.70**	.54**	.70**		
7. Expectancy_Global Negative	-.07	.21*	.22**	.33**	.42**	.32**	
8. Expectancy_Cognitive & Behavioral Impair	<.01	.23**	.44**	.33**	.56**	.67**	.60**

* *Note.* $p < .05$ ** $p < .01$

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Table 4.

Significant Predictors of Hypersexuality in Stepwise Regression

Steps	<i>B</i>	<i>SEB</i>	β	<i>t</i>	<i>R</i>	Adjusted <i>R</i> ²
1. Alc Past 3Mo Use <i>F</i> (1,135)=5.98, <i>p</i> <0.05	.11	.04	.21	2.45	.21	.04
2. Expec_Enhancement <i>F</i> (2,135) = 9.93, <i>p</i> <.01	.04	.01	.30	3.65	.36	.12
3. Expec_Relaxation <i>F</i> (3,135) = 8.14, <i>p</i> <.01	-.04	.02	-.28	-.20	.36	.14

** *Note.* *p*<.01; Alc Past 3Mo Use= past three month alcohol use; Expec_Enhance = perceptual and cognitive enhancement expectancy
Expec_Relax= relaxation and tension reduction expectancy