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Cannabis and Related Impairment: The Unique Roles of Cannabis Use to Cope with Social Anxiety and Social Avoidance

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Abstract

Background and Objectives—Social anxiety appears to be a risk factor for cannabis-related problems. Socially anxious individuals are vulnerable to using cannabis to cope in social situations and to avoiding social situations if marijuana is unavailable. Yet, the relative impact of cannabis use to cope with social anxiety relative to use to cope with negative affect more broadly has yet to be examined.

Methods—The present study used the *Marijuana to Cope with Social Anxiety Scale* (MCSAS) to examine the incremental validity of using cannabis use to cope in social situations (MCSAS-Cope) and avoidance of social situations if cannabis is unavailable (MCSAS-Avoid) in a community-recruited sample of 123 (34.1% female) current cannabis users.

Results—After controlling for age of first cannabis use, gender, alcohol and tobacco use, other cannabis use motives, and cannabis expectancies, MCSAS-Cope remained significantly positively related to cannabis use frequency and cannabis-related problems. After controlling for age of first cannabis use, gender, alcohol and tobacco use, and experiential avoidance, MCSAS-Avoid remained significantly related to cannabis problems but not frequency.

Discussion and Conclusions—The present findings suggest that cannabis use to manage social forms of anxiety may be important to understanding cannabis use behaviors.

Scientific Significance—The current findings identify cognitive/motivational factors implicated in more frequent cannabis use and in cannabis-related impairment, which may be essential to inform efforts to further refine prevention and treatment efforts.

INTRODUCTION

Social anxiety maintains a robust and potentially unique relation with cannabis-related impairment. Nearly one-third to one-fourth of people with cannabis dependence have social

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Declaration of Interest

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anxiety disorder (SAD), a higher rate than for panic disorder, generalized anxiety disorder, and post-traumatic stress disorder.^{1,2} Elevated social anxiety in non-clinical samples also is related to more cannabis-related problems.^{3–9} Compared to adolescents without SAD, those with SAD are almost seven times more likely to develop cannabis dependence in early adulthood.¹⁰ Moreover, among those with SAD and a cannabis use disorder (CUD), social anxiety tends to onset prior to the CUD¹¹ and other anxiety disorders are often not significantly prospectively related to CUD after adjusting for co-occurring disorders and/or other substance use.¹⁰ Among adolescent cannabis users, SAD is related to transition from first use to cannabis-related problems after adjusting for delinquency.¹²

Taken together, available data suggest that social anxiety may be a risk factor for the development of cannabis-related problems. Thus, there may be something about the nature of social anxiety specifically that puts these individuals at such high risk for cannabis problems.¹³ Given that cannabis tends to be used in social situations,¹⁴ use to manage anxiety specifically in social situations may play a particularly salient role in cannabis-related problems. Buckner et al.⁷ developed the *Marijuana to Cope with Social Anxiety Scale* (MCSAS) to assess cannabis use to cope in social situations (MCSAS-Cope) and avoidance of social situations if cannabis was unavailable (MCSAS-Avoid). MCSAS-Cope and MCSAS-Avoid were significantly correlated with coping and social motives for cannabis.⁷ Over 36% of those with normative levels of social anxiety and 65.9% of those with clinically elevated social anxiety reported using cannabis to cope in social situations. Further, 40.9% of those with normative levels of social anxiety and 60.0% of those with clinically elevated social anxiety endorsed avoiding social situations if cannabis was unavailable. MCSAS scores were positively correlated with more frequent use and more cannabis-related problems.

Although past work suggests that cannabis use to manage social anxiety may play an important role in cannabis-related behaviors, it is unknown whether MCSAS-Cope is incrementally associated with cannabis use and use-related problems above and beyond measures that assess cannabis use to cope with negative affect (eg, coping motives) or social anxiety (eg, conformity motives) more generally and expecting cannabis use to decrease negative affect (eg, positive cannabis expectancies), which are related to cannabis use and use-related problems.^{3,6,15–18} Further, negative expectancies (eg, cognitive and behavioral impairment) are related to social anxiety^{6,19} and it is therefore important to test whether cannabis use behaviors in social situations remain related to use and use-related problems after controlling for these expectancies. It is also unknown whether MCSAS-Avoid is associated with cannabis-related behaviors beyond other types of avoidance behaviors. For instance, experiential avoidance describes unwillingness to remain in contact with certain internal experiences (eg, thoughts, emotions) combined with attempts to regulate these experiences.²⁰ Experiential avoidance is a higher-order construct comprised of lower-order factors such as behavioral avoidance (overt avoidance of distressing situations), distress aversion (non-acceptance of distress), procrastination (delaying anticipated distress), distraction/suppression (ignoring or suppressing distress), repression/denial (distancing and dissociating from distress), and distress endurance (willingness to behave effectively in the face of distress).²¹ Experiential avoidance appears related to substance use behaviors²² and to anxiety among substance users.²³ It is, therefore, unknown whether social avoidance is

particularly relevant to cannabis use and use-related problems or whether prior findings⁷ reflect the relation of avoidance more broadly to cannabis use. To address these gaps, the current study set out to test the incremental validity of the MCSAS scales in terms of cannabis use frequency and use-related problems in a racially diverse sample of community-recruited current cannabis users. Given that gender, age of first cannabis use, and alcohol and tobacco use are related to cannabis use and use-related problems,^{11,24} these variables were included as covariates in relevant analyses.

METHOD

Participants and Procedures

The sample consisted of 123 individuals (34.1% female; $M_{\text{age}} = 20.9$; $SD = 2.7$) recruited as part of an on-going study of psychosocial factors related to cannabis use via community advertisements (eg, flyers and newspaper ads targeting current cannabis users). Interested participants completed an on-line screening to assess eligibility criteria: being 18–45 years old, self-reported past-month cannabis use, cannabis as drug of choice, and no current substance abuse treatment. Eligible participants were invited to the laboratory to complete study measures using www.surveymonkey.com. Participants in the current study include those that completed these self-report measures. Participants were compensated \$25 for completion of these measures and asked to refrain from cannabis use the day of their appointment. Informed consent was obtained and procedures received Institutional Review Board approval. Importantly, this sample is independent from the sample used in the initial study of the MCSAS.⁷

The sample was predominantly non-Hispanic/Latino (92.7%) and the racial composition was 59.3% Caucasian or White, 21.1% African American or Black, 4.1% Asian or Asian American, .8% Native American, 11.4% “mixed,” and 3.3% “other.” Most (90.2%) reported their marital status as single and were employed either part-time (41.5%) or full-time (13.0%). Although recruited from the community, the majority (88.6%) were undergraduate or graduate students. Mean age of first cannabis use was 16.0 years ($SD = 2.1$; range = 11–22) and 97.6% of the sample used cannabis at least once per week, with 73.2% reporting daily use. Nearly one-fourth (24.4%) were current tobacco smokers who smoked a mean of 2.02 ($SD = 4.6$) cigarettes per day. The majority (95.1%) drank alcohol in the past month, drinking approximately 1–2 times per week on average. Regarding social anxiety, 38.6% of the sample scored in the clinical range on the social interaction anxiety scale,²⁵ a self-report measure of social interaction fears.

Measures

Marijuana Use to Cope with Social Anxiety Scale (MCSAS)—The MCSAS⁷ is comprised of items derived from the Liebowitz Social Anxiety Scale (LSAS),²⁶ a highly reliable and valid measure of anxiety and avoidance in specific social situations.²⁷ Participants rated from 0 (*never*) to 3 (*usually, 68–100%*) the degree to which they use cannabis to cope in 24 social situations and the degree of avoidance if cannabis was unavailable in each situation. Given low endorsement on both the coping and avoidance scales on two items (telephoning in public, urinating in a public bathroom), these items were

removed. Consistent with prior work,^{7,28} each item was scored dichotomously indicating whether an individual did (ie, scored 1–3) or did not (scored 0) endorse each item. The endorsed responses for the remaining 22 items were summed. MCSAS scales have demonstrated adequate internal consistency and evidence of convergent and discriminant validity.⁷ In the current sample, the MCSAS-Cope ($\alpha = .92$) and MCSAS-Avoid ($\alpha = .95$) scales demonstrated adequate internal consistency.

Substance Use—Consistent with the Core Institute’s Campus Assessment of Alcohol and Other Drug Norms and prior work²⁹, participants indicated how often they typically use cannabis from 0 (*never*) to 8 (*daily*). The Marijuana Problems Scale³⁰ assessed 19 past 90-day cannabis-related problems from 0 (*no problem*) to 2 (*serious problem*). Endorsed items were summed. This measure has demonstrated adequate internal consistency in prior work^{30,31} and in the present sample ($\alpha = .79$). Alcohol use frequency was assessed by asking participants to rate how often they drank in the last month from 0 (*not at all*) to 6 (*every day*). Participants who endorsed smoking tobacco were asked to rate their cigarettes per day on an average day over the past week.

Motives and Expectancies—The Marijuana Motives Measure (MMM)¹⁷ asks participants to rate cannabis use for a variety of reasons from 1 (*almost never/never*) to 5 (*almost always/always*). The five MMM 5-item subscales have demonstrated adequate internal consistency.³² In the current sample, the coping, social, conformity, and expansion scales demonstrated adequate internal consistency ($\alpha = .78-.94$). However, the enhancement scale’s internal consistency was low ($\alpha = .60$). The *Marijuana Effect Expectancy Questionnaire* (MEEQ)^{18,33} assessed expectations regarding cannabis use. The higher-order positive expectancy scale is comprised of the relaxation and tension reduction, perceptual and cognitive enhancement, and social/sexual facilitation scales whereas the higher-order negative expectancy scale is comprised of the global negative effects and cognitive/behavioral impairment scales. The negative ($\alpha = .77$) and positive ($\alpha = .82$) expectancy scales demonstrated adequate internal consistency in the current sample.

Experiential Avoidance—The *Multidimensional Experiential Avoidance Questionnaire* (MEAQ)²¹ is a 62-item measure of experiential avoidance. Items are rated from 1 (*strongly disagree*) to 6 (*strongly agree*). The MEAQ consists of six subscales: (1) distress aversion (13 items); (2) behavioral avoidance (11 items); (3) distraction and suppression (7 items); (4) repression and denial (13 items); (5) procrastination (7 items); and (6) distress endurance (11 items). The MEAQ demonstrates convergence with other measures of experiential avoidance.²¹ In the present sample, internal consistency was adequate ($\alpha = .83-.89$).

Data Analyses

Incremental validity of MCSAS scales was examined using hierarchical linear regressions. Separate models were conducted for each MCSAS scale in relation to each criterion (cannabis frequency, cannabis problems). For models in which MCSAS-Cope was the predictor, gender, age of first cannabis use, alcohol and tobacco use, motives, and expectancies were entered as covariates. For models in which MCSAS-Avoid was the predictor, gender, age of first cannabis use, alcohol and tobacco use, and experiential

avoidance were entered as covariates. Covariates were entered simultaneously in Step 1 and the appropriate MCSAS scale was entered into Step 2. This strategy ensured that observed effects at Step 2 could not be attributable to variance accounted for at Step 1.³⁴

RESULTS

Relationships Among Study Variables

Table 1 presents means, standard deviations, and bivariate correlations among study variables. Given the large number of correlations, only those of at least a medium effect size are discussed. Frequency of cannabis use was positively correlated with MCSAS-Cope but not MCSAS-Avoid. Number of cannabis problems was correlated with both MCSAS-Cope and MCSAS-Avoid, as well as conformity motives, negative expectancies, and MEAQ-Procrastination.

Incremental Validity for Cannabis-Related Behaviors

The incremental validity of the MCSAS scales was examined in relation to cannabis use frequency (Table 2). In the MCSAS-Cope model, predictors accounted for 29.9% of the variance in cannabis use frequency. Gender, age of first cannabis use, alcohol and tobacco use, motives, and expectancies accounted for 25.3%, and MCSAS-Cope accounted for an additional 4.6%. Frequency remained significantly positively related to MCSAS-Cope and coping motives. Frequency was negatively related to conformity motives and positive expectancies. In the MCSAS-Avoid model, predictors accounted for 8.9% of the variance in frequency; however, cannabis use frequency was not significantly related to any avoidance measure.

The incremental validity of the MCSAS scales for cannabis problems was examined (Table 3). In the MCSAS-Cope model, predictors accounted for 50.0% of the variance in problems. Gender, age of first cannabis use, cannabis use frequency, alcohol and tobacco use, motives, and expectancies accounted for 40.2%, and MCSAS-Cope accounted for an additional 9.8%. Problems remained significantly related only to MCSAS-Cope, coping and expansion motives, and negative expectancies. In the MCSAS-Avoid model, predictors accounted for 30.0% of the variance in cannabis-related problems, with MCSAS-Avoid uniquely accounting for 7.8% of the variance. Cannabis problems remained significantly related only to MCSAS-Avoid and MEAQ-Behavioral Avoidance.

To test whether MCSAS-Avoid was related to cannabis problem after accounting for MCSAS-Cope, we conducted a hierarchical regression using the strategy outlined in Table 3 with the addition of MCSAS-Cope at Step 1. After accounting for the variance attributable to MCSAS-Cope, MCSAS-Avoid was no longer significantly related to cannabis problems, $\beta = .07$, $p = .321$, $R^2 = .007$. To test the specificity of this finding, we conducted a hierarchical regression using the strategy outlined in Table 3 with the addition of MCSAS-Avoid at Step 1. After accounting for the variance attributable to MCSAS-Avoid, MCSAS-Cope remained significantly related to cannabis problems, $\beta = .36$, $p = .018$, $R^2 = .046$.

DISCUSSION

Social anxiety is an important individual difference variable related to substance use behaviors broadly and cannabis use behaviors in particular (for review see¹³). The current study contributes to our understanding of the role of using cannabis to manage social anxiety in several ways. First, findings strengthen the potential utility of the MCSAS-Cope by illustrating that cannabis use to cope with social anxiety appears especially important to understanding cannabis use behavior. Importantly, MCSAS-Cope remained significantly related to cannabis problems after accounting for the large (40%) percent of the variance attributable to gender, age of first use, motives, expectancies, and frequency of cannabis, alcohol, and tobacco use. In fact, MCSAS-Cope accounted for an additional 10% of the variance in cannabis-related problems after accounting for these variables, suggesting it has a robust and potentially clinically meaningful relation to cannabis-related problems.³⁵ Further, MCSAS-Cope was related to more unique variance in cannabis-related problems than coping motives more broadly (as measured with the MMM). It is also noteworthy that MCSAS-Cope remained significantly related to cannabis use frequency after controlling for gender, age of first cannabis use, alcohol and tobacco use, expectancies, and motives. These findings suggest that using cannabis to cope specifically in social situations may play an especially important role in cannabis-related impairment, perhaps more so than using cannabis to cope with negative affect more broadly. It may be that reliance on cannabis to cope in social situations (where the majority of cannabis use occurs¹⁴) may interfere with the learning or use of more adaptive coping strategies. Individuals who rely on cannabis to cope in social situations may come to believe they need cannabis to cope with social situations and thus continue to use cannabis despite experiencing cannabis-related problems. Thus, they may not necessarily use cannabis more frequently but when they do use, their use results in problems (eg, being intoxicated while working or driving).

Although MCSAS-Avoid was not uniquely related to cannabis use frequency, it was uniquely related to cannabis-related problems. However, MCSAS-Avoid was no longer related to cannabis problems after accounting for the variance attributable to MCSAS-Cope, suggesting that individuals who avoid social situations where cannabis is not available may do so because they rely on cannabis to cope in social situations. Thus, these individuals may not necessarily use cannabis more frequently but rather may disproportionately choose to attend social situations in which cannabis is available. They may also choose to spend time with friends who use cannabis rather than those who do not. The choice to attend social events involving cannabis may place these individuals at risk for cannabis-related impairment (eg, driving while intoxicated, using instead of going to work or class).

Although not the primary aim of this study, a few additional findings warrant comment. Data add to a growing literature^{3,16,17,36} finding conformity motives to be negatively related to cannabis use frequency. Perhaps individuals who use cannabis to avoid social scrutiny also engage in more social avoidance. Given that cannabis tends to be used in social situations,^{14,37} these individuals may use less frequently if they tend to avoid social interactions. Future work is necessary to elucidate why conformity motivated use is related to less frequent use. Similarly, positive expectancies were negatively related to cannabis use frequency. Prior work tends to find positive expectancies to be unrelated^{6,38} or weakly

positively related^{39,40} to cannabis use frequency. Thus, it may be that positive expectancies are not directly related to cannabis use frequency but are indirectly related to use via motives or other more proximal factors. Future work testing this hypothesis will be an important next step.

There are limitations of this study that suggest avenues for future research. First, although the sample was relatively racially diverse, it was comprised primarily of younger adults. Second, the cross-sectional design of the present study limits causal inferences, necessitating the use of prospective methodology in the future. Third, data were collected via self-report measures and future work could benefit from a multi-method, multi-informant approach. Fourth, the sample consisted primarily of frequent cannabis users and future work could benefit from testing whether MCSAS scales are related to frequency in samples with greater diversity in use patterns. Fifth, future work is necessary to test other psychometrics properties (eg, test–retest reliability) of the MCSAS.

Overall, the current study highlights the importance of cannabis use to manage social anxiety specifically in understanding cannabis use and use-related problems. Based upon these findings, it is possible that treatment programs that target cannabis use to manage social anxiety may be an important, as of yet unexplored, therapeutic avenue.

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TABLE 1

Descriptive data and bivariate correlations among study variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. MCSAS-Cope																	
2. MCSAS-Avoid	.57**																
3. Cannabis frequency	.33**	.14															
4. Cannabis problems	.44**	.34**	.07														
5. Social motives	.41**	.30**	.10	.19*													
6. Coping motives	.43**	.46**	.20*	.25**	.56**												
7. Enhance motives	-.01	.03	.03	.01	.36**	.09											
8. Conformity motives	.07	.19*	-.18*	.39**	.20*	.15	-.06										
9. Expansion motives	.31**	.39**	.11	.20*	.37**	.35**	.22*	.17									
10. Positive expectancies	.41**	.42**	.05	-.01	.58**	.57**	.23*	-.17	.38**								
11. Negative expectancies	.12	.13	-.11	.50**	.11	.01	.11	.37**	.07	-.02							
12. Behavioral avoidance	.43**	.54**	.15	.27**	.28**	.45**	.08	.15	.33**	.36**	.16						
13. Distress aversion	.36**	.35**	.07	.07	.32**	.48**	.14	.14	.18*	.38**	.02	.58**					
14. Procrastination	.33**	.36**	.10	.33**	.29**	.37**	.11	.19*	.15	.23*	.25**	.54**	.34**				
15. Distraction suppression	.31**	.30**	.14	.10	.36**	.43**	.22*	-.07	.15	.42**	.06	.54**	.57**	.30**			
16. Repression denial	.40**	.43**	.04	.25**	.29**	.44**	.10	.07	.32**	.36**	.22*	.49**	.43**	.45**	.35**		
17. Distress endurance	-.13	-.23*	.02	-.21*	.14	.00	.26**	-.11	.14	.23*	-.08	-.18*	-.06	-.36**	.11	-.19*	
M	9.0	12.1	7.2	5.5	15.2	12.7	21.1	5.9	14.0	91.8	43.0	37.2	44.5	26.0	28.8	34.6	49.1
SD	6.2	13.9	1.2	3.6	5.0	5.1	3.0	2.0	6.5	12.2	9.3	9.3	11.0	7.7	7.1	11.1	8.8

MCSAS = marijuana to cope with social anxiety scale.

* $p < .05$;

** $p < .01$.

Cannabis use to cope with social anxiety and avoidance of social situations if cannabis unavailable as incremental predictors of cannabis use frequency

TABLE 2

	R^2	β	t	sr^2	p
MCSAS-Cope					
Step 1	.253				.039
Gender		-0.11	-0.92	0.01	.364
Age of first cannabis use		0.18	1.51	0.03	.136
Alcohol use		-0.01	-0.10	0.00	.924
Tobacco use		-0.19	-1.65	0.03	.104
Positive expectancies		-0.38	-2.22	0.06	.030
Negative expectancies		-0.03	-0.23	0.00	.818
Social motives		0.26	1.67	0.03	.100
Coping motives		0.38	2.37	0.06	.021
Enhancement motives		0.01	0.04	0.00	.973
Conformity motives		-0.40	-3.06	0.11	.003
Expansion motives		0.06	0.50	0.00	.617
Step 2	.046				.044
MCSAS-Cope					
MCSAS-Avoid	.29	2.05	0.05	.044	
MCSAS-Avoid					
Step 1	.087				.574
Gender		-0.12	-1.11	0.01	.270
Age of first cannabis use		0.11	0.98	0.01	.328
Alcohol use		-0.08	-0.78	0.01	.435
Tobacco use		.01	.09	0.00	.929
Behavioral avoidance		0.19	1.15	0.01	.255
Distress aversion		-0.10	-0.73	0.01	.471
Procrastination		0.06	0.42	0.00	.678
Distraction suppression		0.16	1.11	0.01	.271
Repression denial		-0.01	-0.08	0.00	.936
Distress endurance		0.00	0.01	0.00	.995
Step 2	.002				.681

MCSAS = *marijuana to cope with social anxiety scale*. β = standardized beta weight. sr^2 = squared semi-partial correlation. Gender was dummy coded (0 = male, 1 = female).

	R^2	β	r	sr^2	p
MCSAS-Avoid	0.05	0.41	0.00	.681	

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Cannabis use to cope with social anxiety and avoidance of social situations if cannabis unavailable as incremental predictors of cannabis-related problems

TABLE 3

	R^2	β	t	sr^2	p
MCSAS-Cope					
Step 1	.402				<.001
Gender		0.02	0.20	0.00	.844
Age of first cannabis use		-0.09	-0.83	0.01	.410
Cannabis use frequency		0.09	0.82	0.01	.414
Alcohol use		0.03	0.28	0.00	.780
Tobacco use		-0.06	-0.58	0.00	.564
Positive expectancies		-0.28	-1.73	0.03	.088
Negative expectancies		0.43	3.75	0.13	.000
Social motives		0.07	0.50	0.00	.616
Coping motives		0.30	2.02	0.04	.047
Enhancement motives		-0.11	-0.87	0.01	.390
Conformity motives		0.08	0.65	0.00	.518
Expansion motives		0.24	2.15	0.04	.036
Step 2	.098				<.001
MCSAS-Cope		0.44	3.54	0.06	.001
MCSAS-Avoid					
Step 1	.222				.015
Gender		-0.04	-0.37	0.00	.716
Age of first cannabis use		0.06	0.64	0.00	.521
Cannabis use frequency		0.00	0.01	0.00	.990
Alcohol use		0.15	1.56	0.02	.121
Tobacco use		0.06	0.60	0.00	.549
Behavioral avoidance		0.34	2.18	0.04	.032
Distress aversion		-0.17	-1.27	0.01	.206
Procrastination		0.13	1.00	0.01	.320
Distraction suppression		-0.09	-0.63	0.00	.533
Repression denial		0.14	1.21	0.01	.231

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	R^2	β	t	sr^2	p
Distress endurance		—0.09	—0.86	0.01	.393
Step 2	.078				.002
MCSAS-Avoid		0.35	3.14	0.08	.002

MCSAS = *marijuana to cope with social anxiety scale*; β = standardized beta weight; sr^2 = squared semi-partial correlation. Gender was dummy coded (0 = male, 1 = female).