Short Communication

Cannabis-related impairment and social anxiety: The roles of gender and cannabis use motives

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ABSTRACT

Social anxiety appears to be especially related to cannabis-related problems, yet the nature of this association remains unclear. Some data suggest that socially anxious men may be especially vulnerable to problematic cannabis use. The current study examined the relations between social anxiety, cannabis use and use-related problems, and motives for cannabis use by gender among 174 (42.5% female) current (past-month) cannabis users. Among men, social anxiety was significantly, positively related to the number of cannabis-related problems and coping and conformity motives. Coping and conformity motives mediated the relation between social anxiety and cannabis-related problems. Among women, social anxiety was significantly related only to social motives, and was unrelated to cannabis-related problems. These findings suggest that socially anxious men may be especially vulnerable to using cannabis as a means of avoidance coping (avoiding scrutiny and negative affect), which may contribute to the high rates of cannabis-related problems among socially anxious individuals.

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1. Introduction

Social anxiety plays an important role in the etiology and maintenance of cannabis-related problems. Among those with cannabis dependence, the rate of lifetime social anxiety disorder (SAD) is higher than the rates of generalized anxiety disorder, panic disorder and PTSD (Agosti, Nunes, & Levin, 2002). Adolescents with SAD are seven times more likely to develop cannabis dependence by age 30 (Buckner et al., 2008). Subclinically elevated social anxiety also is related to cannabis-related problems (e.g., Buckner & Schmidt, 2008; Buckner & Schmidt, 2009; Buckner, Schmidt, Bobadilla, & Taylor, 2006).

It may be that socially anxious users are vulnerable to cannabis-related problems because they not only use cannabis to attempt to cope with negative affect (coping motives) but also to bond with cannabis-using peers (social motives) and to avoid scrutiny for non-use when with cannabis-using peers (conformity motives). Individuals with SAD are especially vulnerable to wanting to use cannabis during elevated state anxiety (Buckner, Silgado, & Schmidt, 2011). Persons with co-occurring CUD–SAD report using cannabis to reduce social fears (Buckner, Heimberg, Schneier et al., 2012) and social anxiety is related to using cannabis to cope in social situations and avoiding social situations if cannabis is unavailable (Buckner, Heimberg, Matthews, &

Silgado, 2012). Further, social anxiety is related to coping and conformity motives, and coping motives mediate the social anxiety–cannabis problem relation (Buckner, Bonn-Miller, Zvolensky, & Schmidt, 2007). Social anxiety is also related to having more substance-using peers (Buckner, Mallott, Schmidt, & Taylor, 2006), suggesting that there may be a social component to cannabis use.

There are gender differences in substance use behaviors among socially anxious individuals. Social anxiety is related to drinking problems for women, but not men (Buckner & Turner, 2009; Norberg, Olivier, Alperstein, Zvolensky, & Norton, 2011) and social anxiety is differentially related to drinking motives by gender (Norberg, Norton, Olivier, & Zvolensky, 2010). Among those with SAD, men are more likely to have a co-occurring CUD (Buckner, Heimberg, Schneier et al., 2012) and socially avoidant men are more vulnerable to cannabis-related problems than women and men with less social avoidance (Buckner, Heimberg, & Schmidt, 2011). Social avoidance may be but one type of avoidance coping in which these men engage. They also may be vulnerable to using cannabis to help them cope with (i.e., avoid experiencing) negative affective states and to avoid scrutiny from cannabis-using peers.

The aim of the present study was to examine the relations between social anxiety and cannabis use behaviors in several ways. First, the relations between social anxiety and cannabis use and use-related problems were examined separately by gender. In line with prior work (Buckner et al., 2011; Oyefeso, 1991), it was hypothesized that social anxiety would be related to cannabis-related behaviors among men. Second, the relations between social anxiety and cannabis use motives

were examined by gender. It was hypothesized that social anxiety would be related to coping and conformity motives among men and to social motives among women. Third, we examined whether coping and conformity motives mediated the relation between social anxiety and cannabis-related behaviors for men. These relations were examined among those who use both tobacco and cannabis given that these individuals are especially vulnerable to pathological social anxiety (Agrawal et al., 2011).

2. Method

2.1. Participants and procedure

Participants were adult smokers who responded to community-based advertisements to participate in a larger study examining the efficacy of a tobacco smoking cessation program. Participants had to smoke 8 or more cig/day on average for at least 1 year, provide a CO breath sample of 10 ppm or higher, and be at least 18 years old. Exclusion criteria included: high-risk suicidal behaviors, psychosis, currently using other tobacco smoking cessation treatment, or unable to give informed consent. All participants provided informed consent prior to data collection. The multi-site study was approved by both universities' Institutional Review Boards. Participants completed computerized versions of measures at baseline.

Although the original sample consisted of 538 participants, the current study is concerned with the 174 participants (42.5% female) that endorsed current (past-month) cannabis use. Ages ranged from 18 to 60 ($M = 29.4$, $SD = 12.3$) and the racial/ethnic composition was: 1.2% Asian or Asian American, 83.8% Caucasian, 7.5% Black/non-Hispanic, 1.2% Black/Hispanic, 2.9% non-Black/Hispanic, and 3.5% "other".

2.2. Measures

2.2.1. The Marijuana Smoking History Questionnaire

The Marijuana Smoking History Questionnaire includes an item assessing current cannabis use frequency on an eight-point Likert-type scale (0 = no use to 8 = more than once a day) and one assessing quantity of use (size of typical cannabis joint) (Bonn-Miller & Zvolensky, 2009). This questionnaire has performed well in prior studies (e.g., Bonn-Miller, Zvolensky, Marshall, & Bernstein, 2007; Zvolensky et al., 2007).

2.2.2. Marijuana Problems Scale (MPS)

Marijuana Problems Scale (MPS) is a 19-item list of negative consequences of cannabis use in the past 90 days (Stephens, Roffman, & Curtin, 2000). Endorsed items were summed to create a total count of cannabis-related problems. This scoring method has demonstrated adequate internal consistency (e.g., Buckner, Ecker, & Cohen, 2010; Stephens et al., 2000; Stephens et al., 2004). In the present sample, $\alpha = .82$.

2.2.3. Marijuana Motives Measure (MMM)

Marijuana Motives Measure (MMM) is a 25-item measure assessing on a 5-point Likert-type scale the degree to which one has smoked cannabis for the following motives: enhancement (e.g., to get high), coping (e.g., to forget my worries), social (e.g., to enjoy a party), conformity (e.g., to fit in with a group I like), and expansion (e.g., to expand my awareness) (Simons, Correia, Carey, & Borsari, 1998). MMM subscales have demonstrated excellent internal consistency (Chabrol, Ducongé, Casas, Roura, & Carey, 2005). In the present sample, α's = .84–94.

2.2.4. Social Interaction Anxiety Scale (SIAS)

Social Interaction Anxiety Scale (SIAS) assessed general social interaction fears (Mattick & Clarke, 1998). The scale demonstrates adequate internal consistency and test–retest reliability in clinical and non-clinical samples (e.g., Heimberg, Mueller, Holt, Hope, &

Table 1
Multivariate analysis of variance of gender differences on cannabis-related behaviors and social anxiety.

	Men ($n = 99$)	Women ($n = 74$)	F	p	d
	M (SD)	M (SD)			
# Cannabis problems	3.98 (3.54)	3.00 (3.10)	3.80	.05	.30
Cannabis use frequency	4.71 (2.38)	5.14 (2.50)	1.20	.28	.17
Cannabis use quantity	3.98 (2.41)	3.53 (2.41)	1.63	.20	.20
Enhancement motives	17.12 (4.92)	16.49 (6.22)	0.52	.47	.11
Social motives	12.74 (5.65)	12.38 (6.02)	0.14	.71	.06
Conformity motives	6.93 (3.09)	5.94 (2.38)	4.65	.03	.33
Coping motives	10.43 (5.03)	11.74 (6.27)	2.21	.14	.23
Expansion motives	11.10 (6.09)	10.62 (6.50)	0.27	.61	.08
Social anxiety	16.36 (12.49)	16.96 (11.71)	0.10	.75	.05

Note. Cannabis use frequency refers to the past 30 day use.

Liebowitz, 1992). As recommended by Rodebaugh, Woods, and Heimberg (2007), only the straightwardly worded items were used. In this sample, $\alpha = .94$.

3. Results

A multivariate analysis of variance (MANOVA) was conducted to examine whether men and women differed on cannabis-related behaviors and social anxiety. The overall model was significant, $F(9, 162) = 2.52$, $p = .010$. Men endorsed more conformity motives and cannabis-related problems (Table 1).[1]

Among men, social anxiety was positively related to cannabis-related problems and conformity and coping motives (Table 2). Among women, social anxiety was significantly correlated only with social motives.

There are four requirements for mediation (Kenny, Kashy, & Bolger, 1998). First, the predictor must be related to the criterion. In this case, social anxiety was related to cannabis-related problems among men (Table 2). Second, the predictor must be related to the proposed mediators. Among men, social anxiety was significantly related to coping and conformity motives (Table 1); thus these variables were examined as potential mediators of the social anxiety–cannabis problems relationship. Third, the proposed mediators (conformity and coping motives) remained significantly related to the criterion (cannabis problems) after controlling for the predictor (social anxiety; Table 3). The final requirement involves evaluating the relation between the predictor and the criterion when the variance accounted for by the proposed mediator has been removed. In these analyses, conformity and coping motives both partially mediated the relationship between social anxiety and cannabis-related problems (Table 3). Given the number of multiple comparisons in Table 3, Sobel tests confirmed partial mediation for both conformity ($z = 2.34$, $p = .019$) and coping ($z = 1.99$, $p = .046$) motives[1].

4. Discussion

Results highlight the importance of considering gender when examining the relations between social anxiety and cannabis use behaviors. Consistent with prior work (Buckner et al., 2011; Buckner, Heimberg, Schneier et al., 2012), findings suggest that socially anxious men are particularly vulnerable to cannabis-related problems. Social anxiety was related to those motives theoretically relevant to social anxiety (coping and conformity motives among men, social motives among women). These findings differ from prior work using a mixed gender sample (Buckner et al., 2007), suggesting that combining men and women in those analyses may have obfuscated these relations.

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[1] Analyses were re-run controlling for severity of nicotine dependence as assessed with the *Fagerstrom Test for Nicotine Dependence* (Heatherton, Kozlowski, Frecker, & Fagerström, 1991). A similar pattern of significant findings was obtained.