Marijuana Effect Expectancies: Relations to Social Anxiety and Marijuana Use Problems

Julia D. Buckner[a*] and **Norman B. Schmidt**[b]

a*Department of Psychiatry, Yale University School of Medicine, 389 Whitney Ave., New Haven, CT, USA, 06511.*

b*Department of Psychology, Florida State University, Tallahassee, Florida, USA 32306-1270. Email: Schmidt@psy.fsu.edu.*

Abstract

High social anxiety is related to marijuana problems, yet the nature of this relation remains unclear. We examined relations between marijuana effect expectancies, social anxiety, and marijuana among undergraduates (*N*=337). Social anxiety was related positively to negative expectancies and negatively to Tension Reduction Expectancies. Among socially anxious individuals, greater belief that marijuana produces cognitive/behavioral impairment was associated with greater marijuana use rates. Negative expectancies mediated the social anxiety-marijuana problems link. These data provide new insight into problematic marijuana use among this high-risk group.

Keywords

Marijuana; Cannabis; Expectancies; Social Anxiety; Social Phobia

1. Introduction

Marijuana use remains high among college students, with approximately one-third endorsing current use (Kilmer et al., 2006). These high rates of marijuana use are cause for concern because recent evidence suggests this population is vulnerable to marijuana-related problems. In fact, at one university, nearly 15% of first-year college students exhibited at least one symptom of a marijuana use disorder, with almost 10% exhibiting marijuana-related problems significant enough to warrant a diagnosis of marijuana use disorder (MUD) (Caldeira, Arria, O'Grady, Vincent, & Wish, 2008). In that sample, nearly one-fourth of current marijuana users met criteria for an MUD with the majority of frequent users reporting significant marijuana-related problems.

The identification of individuals at risk for the development of marijuana problems remains an important goal. Emerging data suggest that undergraduates with higher social anxiety may be particularly vulnerable to marijuana problems and symptoms of MUD (Buckner, Bonn-Miller, Zvolensky, & Schmidt, 2007; Buckner, Mallott, Schmidt, & Taylor, 2006; Buckner,

Schmidt, Bobadilla, & Taylor, 2006). Further, in a recent longitudinal investigation, adolescents with social anxiety disorder (SAD) were nearly *five times* more likely to develop marijuana dependence as young adults even after controlling for a wide array of relevant Axis I psychopathology (other anxiety disorders, depression, externalizing disorders) (Buckner, Schmidt et al., 2008), suggesting social anxiety may serve as a risk for marijuana problems.

Despite emerging evidence that students with higher social anxiety may be particularly vulnerable to marijuana problems, mechanisms underlying the greater risk of marijuana problems among this population remain largely unexplored. One promising area is that of marijuana effect expectancies (i.e., expectations about the effects of marijuana). It seems that marijuana-using undergraduates with Positive Expectancies (i.e., expecting positive marijuana effects) engage in more frequency marijuana use, whereas expecting negative consequences (i.e., Negative Expectancies) is related to decreased frequency (Simons & Arens, 2007). Regarding specific Positive Expectancies, in a clinical sample, marijuana users were more likely to endorse Tension Reduction/Relaxation expectancies than past- or non-users (Galen & Henderson, 1999).

Although we know of no studies of marijuana expectancies and social anxiety, there is good reason to believe that individuals with higher social anxiety may hold high-risk marijuana expectancies. Higher social anxiety is associated with greater endorsement of coping motives (i.e., using marijuana to cope with negative affect) and this motive mediated the relation between marijuana problems and social anxiety among undergraduates (Buckner, Bonn-Miller et al., 2007). Thus, marijuana users with higher social anxiety may use marijuana because they believe the effects of marijuana can help manage their anxiety. Given that marijuana use motives can only be assessed among individuals who use marijuana (because they assess reasons why the individual uses marijuana) whereas expectations regarding marijuana's effects can be examined among individuals regardless of marijuana use status, examination of expectancies may provide information as to why some individuals with higher social anxiety go on to develop marijuana problems whereas others do not.

The present investigation was comprised of five interrelated research aims focused on elucidating the relations between marijuana use and problems, marijuana effect expectancies, and social anxiety among undergraduates. First, given ambiguity regarding whether social anxiety is related to frequency of marijuana use (Buckner, Bonn-Miller et al., 2007; Oyefeso, 1991), we examined whether social anxiety was related to marijuana use frequency in the present sample. Second, although prior work has examined the relations between particular marijuana expectancies and marijuana use frequency (Aarons, Brown, Stice, & Coe, 2001; Galen & Henderson, 1999; Schafer & Brown, 1991), we know of only one study investigating whether particular marijuana effect expectancies are associated with marijuana-related *problems*. Gaher and Simons (2007) found higher-order Negative and Positive Expectancies to be unrelated to marijuana problems; yet they did not examine whether specific, lower-order expectancies (e.g., Tension Reduction, Social Facilitation) were correlated with marijuana problems. To address this gap in the literature, the present study examined whether particular marijuana expectancies were related to greater marijuana problems.

Third, we examined whether individuals with higher social anxiety were more likely to endorse high-risk marijuana effect expectancies. Fourth, to examine whether particular expectancies were related to marijuana use among those with higher social anxiety, we tested whether social anxiety-related expectancies moderated the relation between social anxiety and marijuana use even after controlling for variables (gender, depression) related to both social anxiety and marijuana use (Buckner, Keough, & Schmidt, 2007; Buckner, Mallott et al., 2006; Buckner, Schmidt et al., 2008). Finally, we examined whether social anxiety-related expectancies mediated the relations between social anxiety and marijuana use problems.

2. Method

2.1. Participants

The present sample consisted of 337 (58.8% female) undergraduates recruited through introductory psychology course sections who received research credit for their participation. The mean age was 18.80 (range = 18–26, *SD* = 1.17). The racial and ethnic composition of the sample was as follows: 6.6% African American or Black, 0.3% American Indian, 2.7% Asian, 79.4% Caucasian or White, 7.8% Hispanic/Latino, 2.7% mixed race/ethnicity, and 0.6% "other". Participants provided written informed consent and completed a battery of self-report measures. No participant refused participation.

2.2. Measures

Marijuana Use Form (MUF)—The MUF is a self-report instrument that assesses marijuana use (Buckner, Bonn-Miller et al., 2007). Participants reported whether they have ever used marijuana and usual frequency of marijuana use (lifetime and past month). This questionnaire has been used to successfully assess marijuana use behaviors (Buckner, Bonn-Miller et al., 2007).

Marijuana Problems Scale (MPS)—The MPS is a 19-item list of negative social, occupational, physical, and personal consequences associated with marijuana use in the past 90 days (Stephens, Roffman, & Curtin, 2000). Chronbach's alpha (.88) suggests the measure was internally consistent in the present sample, with scores ranged from 0.00–28.00 (*M* = 2.38, *SD* = 3.96). This mean is consistent with means found in other undergraduate samples (Buckner, Bonn-Miller et al., 2007).

Marijuana Expectancies Questionnaire (MEEQ)—The MEEQ is a 48-item list of expectations regarding marijuana use (Aarons et al., 2001). The questionnaire was developed to be used by those with and without marijuana use histories. The scale is comprised of six lower order scales: Cognitive and Behavioral Impairment, Relaxation and Tension Reduction, Social and Sexual Facilitation, Perceptual and Cognitive Enhancement, Global Negative Effects, and Craving and Physical Effects. Two higher order scales can also be derived: Positive Expectancies and Negative Expectancies. In the present sample, the lower and higher order scales demonstrated adequate internal consistency: Cognitive/Behavioral Impairment (α = .87), Relaxation and Tension Reduction (α = .90), Social/Sexual Facilitation (α = .70), Perceptual/Cognitive Enhancement (α = .85), Global Negative Effects (α = .87), Craving/Physical Effects (α = .90), Negative Expectancies (α = .91), and Positive Expectancies (α = .70).

Social Interaction Anxiety Scale (SIAS)—The SIAS is a measure of general social interaction fears that corresponds to the description of generalized SAD (Mattick & Clarke, 1998). The scale demonstrates high levels of internal consistency and test-retest reliability across clinical, community, and student samples (Heimberg, Mueller, Holt, Hope, & Liebowitz, 1992; Mattick & Clarke, 1998; Osman, Gutierrez, Barrios, Kopper, & Chiros, 1998). In the present sample, the SIAS demonstrated adequate internal consistency (α = .93) and scores ranged from 3–69 (*M* = 22.63, *SD* = 12.28), with 18.8% of the sample exhibiting scores in the clinical range (Heimberg et al., 1992). This mean is consistent with that found in other college samples (Buckner, Eggleston, & Schmidt, 2006).

Beck Depression Inventory (BDI)—The BDI is a well-validated measure of depressive symptomatology (Beck & Steer, 1987). In the present sample, the BDI demonstrated excellent internal consistency (α = .92) and scores ranged from 0 to 48 (*M* = 8.51, *SD* = 8.01). This mean

is similar to means found in other college samples (e.g., Buckner, Bernert, Cromer, Joiner, & Schmidt, 2008).

3. Results

3.1. Marijuana Use Patterns

In the present sample, 231 (68.5%) reported lifetime marijuana use, 150 (44.6%) reported past-month use, 103 (30.6%) reported weekly use, and 40 (11.7%) reported daily use. Lifetime marijuana users demonstrated an average MUF score of 3.29 (SD = 1.51), indicating an average lifetime usage in the 1–2 times per month range. Among participants reporting past-month use, the average MUF score was 4.50 (SD = 2.83), indicating an average past-month usage in the twice per week range.

3.2. Relations between marijuana use frequency and social anxiety, marijuana problems and expectancies

A multivariate analysis of variance (ANOVA) was conducted to examine the relations between marijuana use frequency and SIAS, MPS, and expectancies (Table 1). In line with prior work (Aarons et al., 2001), three groups of lifetime drug use pattern were used: nonusers (never used marijuana; n = 105), infrequent users (less than weekly marijuana use; n = 122), and frequent users (weekly or more marijuana use; n = 109). Frequency was not significantly related to SIAS but was related to MPS and all MEEQ scales. Tukey post hoc analyses (using an adjusted p value of .01) were conducted to examine the nature of significant relations. Frequent users reported more marijuana use problems than infrequent and nonusers. Frequent users also reported more Tension Reduction, Social Facilitation, Enhancement, and the higher-order Positive Expectancies as well as lower scores on the higher-order Negative Expectancies. Nonusers endorsed more Global Negative Effects and fewer Craving/Physical Effects Expectancies than infrequent and frequent users.

3.3 Relations between marijuana problems and marijuana expectancies

Given MPS assesses past 90-day marijuana problems, multivariate linear regression analyses were conducted with current marijuana users (Table 2). MPS was related to Negative but not Positive Expectancies. Regarding lower-order expectancies, MPS was related to Impairment and Global Negative Expectancies.

3.4 Relations between social anxiety and marijuana expectancies

Results from a multivariate linear regression suggest that in the entire sample SIAS was significantly related to higher-order Negative Expectancies, $t(292)$ = 3.46, p = .001, but not higher-order Positive Expectancies, $t(292)$ = −.61, p = .54. Regarding specific Negative Expectancies, SIAS was related to Impairment Expectancies, $t(297)$ = 2.10, p = .04, but not Global Negative Expectancies, $t(297)$ = 1.26, p = .21. Regarding specific Positive Expectancies, SIAS was negatively related to Tension Reduction Expectancies, $t(304)$ = −2.31, p = .02, and positively related to Enhancement Expectancies, $t(304)$ = 2.41, p = .02. SIAS was unrelated to Social Facilitation Expectancies, $t(304)$ = .52, p = .61.

Relations between SIAS and expectancies among current users are presented in Table 2. As in the entire sample, SIAS was related to Negative Expectancies as well as Impairment and Tension Reduction Expectancies. However, among current users, SIAS was also related to Global Negative Expectancies.

3.5. Moderational analyses of Use versus Nonuse

A series of hierarchical logistic regression analyses were conducted to examine whether those MEEQ scales related to SIAS moderated the relation between SIAS and marijuana use (0=no, 1=yes). Separate regressions were conducted for each MEEQ scale (Table 3). Predictor variables included SIAS, the MEEQ scale, and their interaction. Predictors were centered to reduce multicollinearity (Aiken & West, 1991). Covariates (gender, depression) were entered at step 1; the main effects of each predictor were entered at step 2; and the centered interaction term was entered at step 3 (Baron & Kenny, 1986). This approach ensured that observed effects for the interactions at step 3 cannot be attributed to shared variance with the variables at steps 1 and 2 (Cohen & Cohen, 1983). Only Impairment Expectancies moderated the relations between SIAS and marijuana use, such that among individuals with higher SIAS, marijuana users (M=36.19, SD=7.26) reported significantly greater Impairment Expectancies than nonusers (M=29.42, SD=8.81), $F(1, 50) = 8.82$, $p = .005$. Among individuals with lower SIAS, nonusers (M=30.66, SD=10.11) and users (M=31.73, SD=7.80) did not differ on Impairment Expectancies endorsement, $F(1, 250) = .80$, $p = .37$.

3.6. Mediation Analyses

The mediational roles of MEEQ scores in regard to the relation between SIAS and MPS among current users were examined. High-order Negative Expectancies as well as Impairment and Global Negative Expectancies met the criteria for mediation (Kenny, Kashy, & Bolger, 1998). Sobel tests suggest that all three mediated the relation between SIAS and MPS: Negative, $z = 2.83$, $p = .004$; Impairment, $z = 2.38$, $p = .02$; Global Negative Expectancies, $z = 2.43$, $p = .02$.

Due to limitations of testing medication using cross-sectional data, one method of increasing confidence in the observed effects is to conduct additional analyses after reversing the proposed mediator with the criterion (Buckner, Bonn-Miller et al., 2007; Sheets & Braver, 1999). MPS did not mediate the relations between SIAS and Negative ($z = 1.78$, $p = .07$), Impairment ($z = 1.72$, $p = .09$), or Global Negative ($z = 1.71$, $p = .09$) Expectancies. In other words, these models failed to account for the data thereby increasing confidence in the original models' mediational effects.

4. Discussion

The present study adds to the growing body of literature indicating that social anxiety is related to marijuana use problems (Buckner, Bonn-Miller et al., 2007; Buckner, Mallott et al., 2006; Buckner, Schmidt et al., 2006) and contributes several unique insights into this relationship. First, social anxiety may not be associated with frequency of marijuana use among undergraduates. Second, in addition to their relationships to marijuana use patterns, particular marijuana expectancies may be related to marijuana problems. Third, social anxiety appears positively related to Negative Expectancies and negatively related to Tension Reduction Expectancies. Fourth, individuals with higher social anxiety and low Impairment Expectancies were least likely to endorse marijuana use. Fifth, negative expectancies may at least partially account for marijuana problems among those with higher social anxiety.

4.1. Social Anxiety Linked to Greater Marijuana Problems, not Greater Marijuana Use

Present findings, combined with prior work (Buckner, Bonn-Miller et al., 2007), suggest that social anxiety is unrelated to frequency of marijuana use among college students. Although this finding is in contrast to other work (Oyefeso, 1991), methodological differences could contribute to these discrepant findings. First, each study used different measures of social anxiety and marijuana use. Second, the two studies from our group included women whereas Oyefeso tested only men. Alternatively, it may be that socially anxious individuals only use

substances to manage anxiety and/or to avoid negative evaluation. By limiting marijuana use to situations involving social anxiety, socially anxious marijuana users may not be vulnerable to using marijuana more frequently than those with lower social anxiety (see Buckner, Bonn-Miller et al., 2007). Rather, when they do use these substances, socially anxious individuals appear at risk for problems related to use (e.g., Buckner, Schmidt et al., 2008).

4.2. Relations between Marijuana Effect Expectancies and Marijuana Problems

The present study is the first known investigation of the relations between lower-order marijuana expectancies and marijuana problems. Multivariate analyses suggest that among current users, marijuana problems appear significantly positively correlated with the higher-order Negative Expectancy scale as well as the lower-order negative expectancies Impairment and Global Negative Expectancies. These data suggest that marijuana users who hold these beliefs about the effects of marijuana use may be particularly vulnerable to marijuana-related impairment. An alternate interpretation of these data is that individuals with higher marijuana problems have come to expect marijuana use to result in negative outcomes. Thus, although the present data serve as an important first step in understanding the relations between marijuana problems and expectancies, prospective work is necessary to fully delineate the nature of these relations.

4.3. Social Anxiety, Marijuana Expectancies, and Marijuana Use

Social anxiety was associated with several risky expectancies that appear to play important roles in marijuana use and marijuana problems. For instance, among individuals with higher social anxiety, those who reported greater Impairment Expectancies were more likely to have used marijuana. Although this finding seems contrary to prior work finding negative expectancies such as Impairment to be negatively related to use (e.g., Aarons et al., 2001; Simons & Arens, 2007), there are several possible interpretations of these novel data. First, it may be that cognitive and/or behavioral impairment is actually desirable by at least some with social anxiety. Items that make up the Cognitive/Behavioral Impairment subscale include *Marijuana slows thinking and actions; Marijuana alters my personality*. It may be that some individuals with social anxiety use marijuana because they expect marijuana to slow their anxiety-induced racing thoughts, to change their personality into one less likely to warrant negative evaluation, and/or so things around them seem less real and, perhaps, less anxiety-provoking. Unfortunately, the MEEQ does not assess desirability of the particular marijuana expectancies so this hypothesis cannot be examined in the present study.

Alternatively, it may be that because socially anxious individuals expect marijuana to produce cognitive and/or behavioral impairment, they assume others expect marijuana to produce these effects as well. They may therefore use marijuana because they believe others will attribute inappropriate or embarrassing behaviors to the effects of marijuana, not as a flaw in the individual's personality. However, the MEEQ assesses "what you think about marijuana, regardless of what other people might think" and future work is necessary to determine whether socially anxious individuals believe others will judge them less negatively when under the influence of marijuana.

4.3. Social Anxiety, Marijuana Effect Expectancies, and Marijuana Problems

Social anxiety was related to greater negative expectancies (higher-order Negative Expectancies and lower-order expectancies of Global Negative Effects and Cognitive/Behavioral Impairment) and endorsement of these negative expectancies appears to at least partially account for the link between social anxiety and marijuana problems among current users. Given negative expectancies tend to be negatively related to marijuana use (Aarons et al., 2001; Simons & Arens, 2007), it remains unclear whether negative expectancies occur prior to marijuana problems (often implicit in mediational models; Baron & Kenny, 1986). We

attempted to strengthen confidence in this contention by evaluating an alterative model in which marijuana problems mediated the relation between social anxiety and negative expectancies. Although no support was evident for such an account, prospective work is necessary.

The present findings suggest that there may be different mechanisms underlying the relations between social anxiety and marijuana versus alcohol problems. Specifically, Tension Reduction and Social Facilitation alcohol expectancies are consistently positively related to social anxiety (Ham, Hope, White, & Rivers, 2002; Tran & Haaga, 2002). However, these findings suggest individuals with higher social anxiety may not expect marijuana to directly lower anxiety but rather expect different effects of marijuana use (e.g., Cognitive/Behavioral Impairment). Future work is necessary to fully elucidate whether socially anxious individuals use different substances to different reasons.

4.5. Limitations and Future Directions

The present study has a number of limitations that suggest the need for further work in this area. First, due to the cross-sectional nature of these analyses, causal inferences cannot be made and both longitudinal and experimental work is needed. Second, self-report measures are vulnerable to biases and replication using a multi-method, multi-informant approach is warranted. Third, the present study examined a non-referred group rather than a treatment-seeking sample. Although our data are thereby generalizable to groups particularly vulnerable to marijuana-related impairment (i.e., undergraduates, young adults), future study is needed to examine whether the observed relations generalize to individuals with clinical levels of social anxiety and marijuana problems.

The present study serves as an important step toward the delineation of mechanisms that may contribute to the high rates of co-occurrence between marijuana-related impairment and social anxiety. Our data suggest that negative expectations about the effects of marijuana use may play an important role in the co-occurrence of social anxiety and marijuana problems. Future work is necessary, however, to fully understand the role of expectancies in marijuana use behaviors among socially anxious individuals. Further, additional work is necessary to continue to delineate the mechanisms underlying marijuana use and marijuana problems among those with social anxiety. Such work will have important implications for the prevention and treatment of this high-risk population.

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Table 1

Multivariate ANOVA results for relations between marijuana use frequency and social anxiety, marijuana-related problems, marijuana effect expectancies.

Dependent Variables	Nonusers M (SD)	Infrequent Users M (SD)	Frequent Users M (SD)	F
Social anxiety	23.63 (11.63)[a]	22.25 (12.13)[a]	22.23 (13.10)[a]	.43
Marijuana problems	.13 (.71)	1.68 (3.05)	5.30 (4.87)	66.93[**]
MEEQ cognitive & behavioral impairment	30.10 (10.03)[a]	33.45 (7.84)[a]	31.34 (7.67)[a]	4.31[*]
MEEQ relaxation & tension reduction	22.60 (9.69)	25.87 (7.59)	29.04 (5.26)	18.32[***]
MEEQ social & sexual facilitation	24.33 (5.89)[a]	24.69 (6.35)[a]	27.33 (5.94)	7.85[**]
MEEQ perceptual & cognitive enhancement	21.24 (8.59)[a]	23.31 (6.61)[a]	26.28 (5.01)	14.58[**]
MEEQ global negative effects	23.97 (8.55)	19.58 (6.36)	15.68 (5.14)	39.30[**]
MEEQ craving & physical effects	17.26 (6.92)	23.53 (5.32)[a]	24.35 (3.67)[a]	53.66[**]
MEEQ negative	54.08 (18.17)[a]	53.11 (12.41)[a]	47.08 (11.20)	7.41[**]
MEEQ positive	68.23 (23.41)[a]	74.11 (17.80)[a]	82.71 (13.49)	16.05[**]

Note. Marijuana effect expectancies were measured using the *Marijuana Effect Expectancy Questionnaire (MEEQ)* (Aarons et al., 2001), social anxiety with the Social *Interaction Anxiety Scale* (Mattick & Clarke, 1998), and marijuana problems with the *Marijuana Problems Scale* (Stephens et al., 2000). Marijuana use frequency grouping: nonusers (those who never used marijuana; $n = 105$), infrequent users (less than weekly marijuana use; $n = 122$), and frequent users (weekly or more marijuana use; $n = 109$).

[a] Means not significantly different from one another ($p < .01$).

[*] $p < .05$

[**] $p < .01$

[***] $p < .001$.

Table 2

Multivariate ANOVA results for marijuana effect expectancies among current users (n = 150).

	Dependent Variable			
	Marijuana Problems		Social anxiety	
Predictor variables	**B (SE)**	**t**	**B (SE)**	**T**
	Higher-order marijuana expectancies			
Positive expectancies	.01 (.03)	.37	−.05 (.08)	−.64
Negative expectancies	.14 (.03)	4.11[***]	.37 (.09)	4.13[***]
	Lower-order Positive Expectancies			
Perceptual & cognitive enhancement	.15 (.10)	1.47	.36 (.27)	1.33
Tension reduction	−.13 (.09)	−1.33	−.64 (.25)	−2.54[*]
Social/Sexual facilitation	−.01 (.08)	−.18	.11 (.21)	.50
Craving and physical effects	.15 (.12)	1.29	.57 (.30)	1.88
	Lower-order Negative Expectancies			
Cognitive/Behavioral Impairment	.13 (.06)	2.27[*]	.36 (.15)	2.35[*]
Global negative effects	.16 (.08)	2.15[*]	.40 (.20)	2.02[*]

Note. Marijuana effect expectancies were measured using the *Marijuana Effect Expectancy Questionnaire* (Aarons et al., 2001), social anxiety with the Social *Interaction Anxiety Scale* (Mattick & Clarke, 1998).

[*]
p < .05

[**]
p < .01

[***]
p < .001.

Table 3

Logistic Regressions for Marijuana Use versus Nonuse.

	B	S.E.	Wald	OR	95% CI Lower	Upper
Negative Expectancies						
Gender	−.92	.29	9.94 *	.40	.22	.71
Depression	.05	.02	6.51 *	1.05	1.01	1.09
Marijuana expectancy	−.02	.01	2.95	.98	.96	1.00
Social anxiety	−.02	.01	2.89	.98	.96	1.00
Social anxiety X expectancy	.00	.00	3.35	1.00	1.00	1.00
Cognitive and Behavioral Impairment Expectancies						
Gender	−1.19	.30	15.78 *	.31	.17	.55
Depression	.03	.02	3.03	1.03	1.00	1.08
Marijuana expectancy	.05	.02	8.15 *	1.05	1.02	1.09
Social anxiety	−.02	.01	2.88	.98	.96	1.00
Social anxiety X expectancy	.00	.00	4.25 *	1.00	1.00	1.01
Tension Reduction Expectancies						
Gender	−1.22	.30	16.69 *	.30	.17	.53
Depression	.04	.02	3.87 *	1.04	1.00	1.08
Marijuana expectancy	.08	.02	23.06 *	1.09	1.05	1.12
Social anxiety	−.02	.01	3.13	.98	.96	1.00
Social anxiety X expectancy	.00	.00	.72	1.00	1.00	1.00
Perceptual Enhancement Expectancies						
Gender	−1.01	.29	12.52 *	.36	.21	.64
Depression	.04	.02	3.37	1.04	1.00	1.08
Marijuana expectancy	.07	.02	13.55 *	1.07	1.03	1.11
Social anxiety	−.03	.01	4.35 *	.98	.95	1.00
Social anxiety X expectancy	.00	.00	.02	1.00	1.00	1.00

Note. Marijuana effect expectancies were measured using the *Marijuana Effect Expectancy Questionnaire* (Aarons et al., 2001), social anxiety with the *Social Interaction Anxiety Scale* (Mattick & Clarke, 1998).

*
$p < .05$.