Short communication

Impulsivity, negative expectancies, and marijuana use: A test of the acquired preparedness model

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Abstract

According to the ‘acquired preparedness model,’ expectancies mediate the relationship between an impulsive personality style and alcohol use. The current study evaluated whether the model can also be applied to marijuana use. Estimated probabilities and subjective evaluations of personally expected marijuana effects, along with impulsivity and frequency of marijuana use, were assessed in 337 college undergraduates. Tests of mediation examining positive and negative marijuana expectancies showed negative expectancies to be a significant mediator for both males and females. That is, participants who were higher on impulsivity had fewer negative expectancies and in turn used more marijuana. This study provides evidence that the acquired preparedness model may help to explain marijuana use.

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1. Introduction

Although a well-developed body of correlational, longitudinal, and experimental studies has demonstrated a relationship between alcohol expectancies and alcohol use (see Smith &
Anderson, 2001 for a review), few studies have examined the relationship between marijuana expectancies and marijuana use (Schafer & Brown, 1991). Moreover, the limited research on marijuana expectancies has not considered the role of distal risk factors and their relationship to expectancies and use. Given that the rate of marijuana use among college students is higher than in the general population, with 25% reporting use in the past year and some colleges reporting rates as high as 54% (Bell, Wechsler, & Johnston, 1997), a better understanding of the ways in which proximal and distal variables contribute to marijuana use and nonuse is warranted.

The current study evaluated a comprehensive model of marijuana use by examining the relationship between a distal (impulsivity) and proximal risk factor (marijuana expectancies) and marijuana use. An impulsive personality style has been identified as both a risk factor and predictor of substance use and abuse (Guy, Smith, & Bentler, 1994). Marijuana expectancies have also emerged as a strong predictor of marijuana use (Aarons, Brown, Stice, & Coe, 2001; Schafer & Brown, 1991). We tested a model similar to the ‘acquired preparedness model’ for alcohol proposed by McCarthy, Miller, Smith, & Smith, 2001 and Smith and Anderson (2001), whereby positive expectancies mediate the relationship between an impulsive personality style and alcohol use. The term “acquired” denotes that personality traits only become a risk factor for substance use when combined with alcohol- or drug-specific learning, or alcohol/drug expectancies. The “preparedness” component reflects the idea that even when both risk factors are present, substance abuse is not certain (Smith & Anderson, 2001). Specifically, we examined the role of both positive and negative expectancies as potential mediators of impulsivity and marijuana use.

2. Method

2.1. Participants

Participants included 248 females (74%) and 89 males (26%) from undergraduate psychology courses at a large, U.S. mid-Atlantic university. The mean age was 20.84 years (S.D.=3.69); 64% (217) classified themselves as Caucasian, 19% (65) as Asian/Pacific Islander, 8% (28) as African American/Black, 5% (18) as Latino, and 4% (9) as “Other” or “Mixed Race.”

2.2. Measures

2.2.1. Impulsivity

Participants’ impulsivity was measured with the Impulsiveness subscale (α=0.78 in the current study) from the Eysenck I7 questionnaire (Eysenck, Pearson, Easting, & Allsopp, 1985). The scale consists of 19 yes/no items that ask individuals about their behavior.

2.2.2. Marijuana expectancies

We developed the Comprehensive Effects of Marijuana (CEOM), a questionnaire in which all of the individual items were the same as those on the Comprehensive Effects
of Alcohol (CEOA). The CEOA (Fromme, Stroot, & Kaplan, 1993) contains 38 items that assess expected outcomes of drinking on a 4-point Likert scale (1=disagree, 4=agree) and subjective evaluations of each of the expected outcomes on a 5-point Likert scale (1=bad, 3=neutral, 5=good). Because we assessed subjective evaluations of marijuana’s expected effects, it was possible to determine, on an individual basis, which effects each respondent deemed positive, neutral, and negative. Positive and negative expectancy scores for each participant were determined by first examining the subjective evaluation rating for a particular effect expectancy item. An item rated as “slightly good” or “good,” was deemed a positive expectancy for that participant, while an item rated as “slightly bad” or “bad,” was deemed a negative expectancy. Then, a score for that item was assigned based on the participant’s previous rating of the likelihood of that effect (1=disagree, 4=agree). Items evaluated as “neutral” were not counted towards the positive or negative expectancy score.

2.2.3. Marijuana use

Participants reported how often they used marijuana over the last year on a scale of 0–9 (0, never used; 9, use more than once a day).

2.2.4. Demographics

Participants reported their age, sex, and race/ethnicity. To facilitate data analysis, individuals identifying as White were coded 0, and African-American/Black, Asian, Hispanic, and Native American participants were coded as 1 (Whites=217, Others=121).

2.3. Procedure

After the University Institutional Review Board approved the procedures, the researchers distributed questionnaires to all students in three undergraduate psychology classes. Students were informed that their responses would be completely anonymous and that they would not receive any extra course credit if they chose to participate, nor would they incur any penalty for refusing to participate or handing in an incomplete questionnaire.

3. Results

We used regression analyses to test whether positive and/or negative expectancies mediate the relationship between impulsivity and marijuana use. As suggested by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) the test of the joint significance, or a test of the two effects comprising the mediator variable, was used in order to examine evidence for intervening variables (i.e., mediators). Because of the large sample size, an alpha level of \( p < .01 \) was chosen as the criterion for statistical significance. Additionally, in cases where interaction terms were computed, continuous predictors were centered at their overall mean to eliminate nonessential multicollinearity. Examination of Cook’s distances revealed no influential outliers.
In separate hierarchical regression equations, positive and negative expectancy variables were regressed onto impulsivity, age, and the dichotomous demographic variables gender and race/ethnicity. In the first step of each equation, the main effect of impulsivity had a unique effect on positive and negative expectancies ($sr^2 = 0.04, 0.02$, respectively). The second steps of the analyses tested for two-way interactions of impulsivity with age, gender, and race/ethnicity. When positive expectancies were being predicted, a significant age $\times$ impulsivity interaction was found; thus, the strength of the relationship between impulsivity and positive expectancies increased with increasing age ($D\Delta R^2 = 0.05, p < 0.001$). Interaction terms did not significantly change the $R^2$ value when negative expectancies were being predicted.

To assess whether the potential intervening variables had an effect on the dependent variable, marijuana use was regressed onto positive expectancies, negative expectancies, impulsivity, age, gender, and race/ethnicity. After controlling for all other variables, the unique effects of negative expectancies ($sr^2 = 0.09$), impulsivity ($sr^2 = 0.02$), and gender ($sr^2 = 0.04$) were significant. The paths between impulsivity and negative marijuana expectancies and between negative expectancies and marijuana use were both significant, indicating that negative expectancies partially mediate the relationship between impulsivity and marijuana use (Fig. 1).

4. Discussion

This study assessed the applicability of the acquired preparedness model to marijuana use so as to contribute to our limited understanding of etiological factors related to marijuana use. The model would predict that expectancies mediate the relationship between an impulsive personality style and marijuana use. In fact, negative expectancies partially mediated the
relationship between impulsivity and marijuana use, such that individuals who were higher on impulsivity held fewer negative expectancies, and, in turn, used marijuana more often. Findings from the current study are consistent with previous research showing that high negative expectancies for marijuana may be protective with respect to initiation and level of marijuana use (Aarons et al., 2001; Schafer & Brown, 1991).

Because this is a cross-sectional study, it is not possible to draw conclusions with respect to the temporal ordering of impulsivity, expectancies, and marijuana use. Previous research has shown, however, that impulsivity develops early in the lifespan (Caspi, 2000), while effect expectancies emerge around third or fourth grade (Miller, Smith, & Goldman, 1990). Our findings suggest that it would be useful to evaluate the acquired preparedness model for marijuana longitudinally, particularly in the context of a substance abuse prevention program for adolescents or young adults. If indeed the temporal order of influence is impulsivity to expectancies to substance use, findings from the current study suggest that interventions should focus on increasing negative expectancies for marijuana, particularly in individuals who are high on impulsivity. It may be more feasible to work towards maintaining or strengthening impulsive individuals’ negative marijuana expectancies rather than trying to change their temperament.

Our sample consisted solely of college students from undergraduate Psychology classes in just one geographical location; thus, the findings should be replicated and generalized cautiously. This study also relied on a self-report measure of marijuana use. Furthermore, this study could not fully examine the role of race/ethnicity because only Whites were represented in sufficient numbers. Nonetheless, this study provides support for the acquired preparedness model (i.e., expectancies mediate the relationship between impulsivity and marijuana use) in marijuana and suggest that negative expectancies may account for the greatest amount of unique variance in marijuana use.

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References


