



Patterns of cannabis use, psychotic-like experiences and personality styles in young cannabis users



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ABSTRACT

Objective: To examine the influence of personality traits on the relationship between cannabis use and psychotic like experiences (PLEs) in young adults.

Method: 499 lifetime cannabis users aged 18 to 25 years completed an online survey assessing PLEs using the positive scale of the Community Assessment of Psychic Experiences (CAPE) and personality styles using the Brief Schizotypal Personality Questionnaire (SPQ-B) and the Substance Use Risk Profile Scale (SURPS), a measure of trait hopelessness, anxiety-sensitivity, impulsivity and sensation seeking. Cannabis use was assessed using items from the Youth Risk Behaviour Survey (YRBS) and a self-report measure of the lifetime level of cumulative cannabis use.

Results: Cannabis use as well as schizotypy and the four SURPS personality risk profiles were significantly associated with the frequency of PLEs in young cannabis users. The cumulative levels of lifetime cannabis exposure, trait schizotypy and hopelessness were the strongest predictors of PLEs in the multivariate analysis. Little evidence of a moderating effect of the personality risk profiles on the relationship between cannabis use and PLEs was found. Trait hopelessness was found to have a moderating effect on the relationship between the recency of cannabis use and the frequency of PLEs.

Conclusions: The cumulative levels of lifetime cannabis exposure, trait schizotypy and hopelessness were associated with PLEs in young cannabis users. Individuals with high levels of trait hopelessness who use cannabis may be at higher risk of PLEs. Future research is required to increase understanding of the relationship between cannabis use and PLEs, using more complex moderation models containing personality traits along with other risk factors for PLEs.

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1. Introduction

Cannabis is the most commonly used illicit drug in the world and has been strongly linked to the onset of psychosis (Arseneault et al., 2002; Fergusson and Boden, 2008; Barragan et al., 2011) particularly among people with a predisposition to psychosis (van Os et al., 2002). Recent research suggests that cannabis use is also associated with psychotic-like experiences (PLEs) among the general population (van Os et al., 2009). PLEs are subclinical psychotic symptoms like hallucinations and delusions, which can occur in up to 8% of the general population (van Os et al., 2009). A meta-analysis of 47 studies conducted by van Os et al. (2009) found that cannabis use was one of the most salient risk factors for PLEs, as well as alcohol and other drug use, life stress and trauma, male gender and urban living. While cannabis use is a well-established risk factor for PLEs, not all cannabis users experience PLEs

or develop clinically relevant psychotic disorders (Caspi et al., 2005). As a result, a growing body of research has focused on the identification of the mechanisms that underlie a cannabis user's vulnerability to PLEs.

One mechanism that has been implicated in the relationship between cannabis use, PLEs and psychosis is trait schizotypy (Barkus and Lewis, 2008; Stirling et al., 2008). PLEs are exacerbated by cannabis use when used by an individual with trait schizotypy (Cohen et al., 2011). Barkus et al. (2006) found that young university students (72% cannabis users) with higher schizotypy scores reported more frequent PLEs when they were intoxicated with cannabis. These findings were replicated in two studies of 532 (100% cannabis users) and 477 (70% cannabis users) young people, in which high scoring cannabis using schizotypes reported significantly more frequent PLEs than those with moderate or low schizotypy scores (Barkus and Lewis, 2008; Stirling et al., 2008). An experimental study also found that cannabis users with high schizotypy achieved a significantly greater reduction in PLEs 3–5 days after smoking a 'spliff' compared to those with low schizotypy (Mason et al., 2009). No significant relationships between other drug use, schizotypy and PLEs were found in any of these studies, indicating

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that there was a specific association between cannabis use, schizotypy and PLEs. Thus, pre-existing schizotypy may be a key factor for identifying which cannabis users are most likely to develop PLEs.

Four other key personality traits have been associated with an elevated risk for substance use in adolescents including hopelessness, anxiety-sensitivity, impulsivity and sensation seeking, measured by the Substance Use Risk Profile Scale (SURPS) (Woicik et al., 2009). Malmberg et al. (2010) found medium to large effect sizes for the associations between the SURPS personality profiles and substance use in a sample of 3783 adolescents. Together, the four personality profiles explained 19.1% of the variance in lifetime alcohol use, 31.3% of the variance in cigarette smoking, and 28.8% of the variance in cannabis use (Malmberg et al., 2010).

While the association between the SURPS personality profiles and substance use in adolescents has been well established, only one study has examined the link between these personality profiles, substance use and PLEs. Mackie et al. (2011) found evidence of a three-group trajectory model of PLEs across four time points, six months apart over a two year period – a persistent PLE group (9% of the sample), an increasing PLE group (7% of the sample), and a group with low level of PLEs at all time points (84% of the sample). Adolescents who followed an increasing trajectory of PLEs scored higher on trait sensation seeking, compared to those with a low level of PLEs ($p = .001$, $d = 0.3$). Higher levels of substance use in the absence of significant alcohol use and emotional difficulties were also found in this group (Mackie et al., 2011). These results indicate that the SURPS personality profiles, particularly sensation seeking, may be important moderators of the relationship between substance use and PLEs.

This study aims to expand upon current research on the relationship between cannabis use and psychotic-like experiences by determining (i) if the SURPS personality profiles and schizotypy are associated with the frequency of PLEs in cannabis users and (ii) if these personality profiles have a moderating effect on the relationship between cannabis use and PLEs in young people. It was hypothesised that trait schizotypy and sensation seeking may moderate the association between cannabis use and PLEs.

2. Method

2.1. Participants

Participants were lifetime cannabis users aged 18 to 25 years. Young people were excluded if they had a previous or current diagnosis of a psychotic disorder.

2.2. Measures

2.2.1. Psychotic-like experiences

The 20-item positive scale of the Community Assessment of Psychic Experiences (CAPE) provided a measure of the frequency of positive psychotic-like experiences on a four point scale (0 = never, 1 = sometimes, 3 = often, 4 = nearly always). The scale has demonstrated high levels of internal consistency (Cronbach's $\alpha = 0.82$), test-retest reliability over 7 months (intra-class correlation (ICC) = 0.63) and construct, concurrent and discriminant validity in a range of clinical and non-clinical samples (Stefanis et al., 2002; Hanssen et al., 2003; Konings et al., 2006; Brenner et al., 2007).

2.2.2. Personality styles

Trait schizotypy was assessed using the 22-item Brief Schizotypal Personality Questionnaire (SPQ-B). The SPQ-B has demonstrated high levels of internal consistency (Cronbach's $\alpha = 0.81$ – 0.83), test-retest reliability over 2 months (ICC = 0.86–0.95), as well as adequate construct and criterion validity in non-clinical adolescents and university students (Raine and Benishay, 1995; Fonseca-Pedrero et al., 2009).

The 23-item Substance Use Risk Profile Scale (SURPS) assessed trait hopelessness, anxiety sensitivity, impulsivity, and sensation seeking (Woicik et al., 2009). This scale has high levels of internal consistency (Cronbach's $\alpha = 0.66$ – 0.80), test-retest reliability (ICC = 0.68–0.88), construct validity across all subscales, as well as concurrent and predictive validity with respect to current and future alcohol use in adolescents, undergraduate students and clinical samples (Conrod and Woicik, 2002; Woicik et al., 2009; Krank et al., 2011).

2.2.3. Substance use

Items from the Youth Risk Behaviour Survey (YRBS) were used to measure the lifetime frequency of cannabis, ecstasy, amphetamine and cocaine use (0 times; 1 or 2 times; 3–9 times; 10–19 times; 20–39 times; 40–99 times; ≥ 100 times), as well as the frequency of cannabis use in the past 12 months (same scale) and past month (0 times; 1 or 2 times; 3–9 times; 10–19 times; 20–39 times; ≥ 40 times). The YRBS has demonstrated adequate to high levels of test-retest reliability in a large sample of young Americans over 2 weeks (kappa (%) = 71–88; Brenner et al., 1995). An additional item asked participants when they last used cannabis. Responses ranged from today to over a month ago.

Self-report items were used to obtain precise information on the young person's lifetime history of cannabis use, from their age of first use to the current day to derive a cumulative measure of lifetime cannabis use. For each year a participant reported using cannabis they were asked (a) "At age (age), how frequently did you use cannabis?" Responses included: never, once or twice, monthly, fortnightly, weekly, a few times per week, daily, or a few times per day (scored 1 to 8). If the participant endorsed 'never' or 'once or twice' they were directed to the next year of use. If any other response was endorsed, the participant was asked (b) "How many months during that year did you smoke that frequently?" Responses included: one, two to three, four to five, six to seven, eight to nine, or ten to twelve months (scored 1 to 6). Cannabis use for each year the participants used cannabis was calculated by multiplying (a) and (b). The resulting scores were then summed to produce a cumulative lifetime cannabis use score. These scores were then divided by the total number of years that the young person endorsed using cannabis to derive an average.

2.3. Procedure

Ethics approval was obtained from the relevant Human Research Ethics Committee. Participants were recruited via posting a link to the survey on several sub-forums of the popular website reddit.com (e.g. r/trees, r/drugs, and r/samplesize). The online survey took 30–45 s to complete. The participants were offered the opportunity to enter a random draw for one of two \$100 PayPal vouchers in recognition of the time taken to complete the survey.

2.4. Data analysis

Following the examination of the data a log₁₀ transformation was applied to the CAPE total variable to correct for positive skew, and an inverse log₁₀ transformation was applied to cannabis use in the past 12 months. As the results of analyses using raw and transformed data did not differ, the results of raw data are reported. Chi square tests of independence were also conducted to determine if there were any significant differences between survey completers and non-completers.

A series of univariate regression analyses were conducted to identify which cannabis use and personality variables were significant predictors of PLEs (CAPE total score). Two hierarchical multiple regression analyses were then conducted to determine which cannabis use and personality style predictors retained significance when entered simultaneously into the analysis, after controlling for age and gender (Step 1). Moderation analyses were then conducted to determine if personality traits moderated the relationship between cannabis use and the frequency of PLEs among young cannabis users. The Statistical Package

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