Cannabis and psychometrically-defined schizotypy: Use, problems and treatment considerations

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ABSTRACT

Cannabis use is associated with onset of psychosis in individuals vulnerable for developing schizophrenia-spectrum disorders. The present study addressed three knowledge gaps pertaining to this issue: 1) clarifying the incidence of cannabis use in schizotypal individuals, 2) examining how cannabis use is related to psychosocial and physiological problems in schizotypy and interest in treatment, and 3) examining how cannabis use is associated with positive, negative and disorganization features of schizotypy. Scores from a measure of schizotypal traits were used to trichotomize 1665 young adults into schizotypy (top 5% of scorers), non-schizotypy (bottom 50% of scorers) and "unconventional" (scorers within the 50th to 85th percentile) groups. Nearly a quarter of the schizotypy group endorsed cannabis use at least weekly, a rate nearly two to four times that of the other groups. The schizotypy group also reported a much greater frequency of cannabis-related problems compared to the other groups. Despite this, interest in treatment for cannabis use in the schizotypy group was not elevated. Interestingly, 85% of individuals in the schizotypy group reported interest in psychological/psychiatric treatment more generally. Cannabis use was not associated with abnormal patterns of positive or disorganized schizotypy traits in the schizotypy group relative to the other groups. However, cannabis use was associated with lower severity of negative traits. Implications of these results are discussed.

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1. Introduction

It is well-accepted that cannabis use is associated with onset of psychosis in individuals vulnerable for developing schizophrenia-spectrum disorder (Arseneault et al., 2004; Caspi et al., 2005; Hall et al., 2004). A critical issue in this regard involves understanding how cannabis use behaviors manifest in schizotypy − defined in terms of a putatively genetic vulnerability for schizophrenia-spectrum pathology (Meehl, 1962). The present study examined three knowledge gaps pertaining to this issue. We aimed to: 1) clarify the incidence of cannabis use in schizotypal individuals, 2) examine how cannabis use is related to psychosocial and physiological problems in schizotypy and examine interest in treatment for cannabis use and for treatment more generally, and 3) examine how cannabis use is associated with positive, negative and disorganization features of schizotypy. These gaps are discussed below.

Regarding the first knowledge gap, there is some support for the notion that greater cannabis use is associated with schizotypal traits. Numerous studies have found psychometrically-defined schizotypy

(defined dimensionally in nearly every study) to be significantly associated with greater cannabis use (Bailey and Swallow, 2004; Dumas et al., 2002; Earleywine, 2006; Esterberg et al., 2009; Mass et al., 2001; Schiffman et al., 2005; Skosnik et al., 2001, 2006; see also Arendt et al., 2008; Caspi et al., 2005; Compton et al., 2009; Miller et al., 2001 for family/genetic studies). Notably, however, theory (Meehl, 1962) and research (e.g., note over a dozen taxometric studies to date; e.g., Lenzenweger and Korfine, 1992) suggest that schizotypy is categorical in nature with a population incidence of approximately 10%. Thus, only a small minority of subjects in prior research would be considered schizotypal in any meaningful sense of the word. Rather, it may be that individuals who endorse greater cannabis use show eccentric or otherwise unconventional (but not necessarily schizotypal) beliefs. These beliefs could be related to the acute effects of cannabis which are similar in some respects to the perceptual distortions, ideas of reference, anxiety, suspiciousness and odd behavior traits associated with schizotypy (Barkus and Lewis, 2008). The link between cannabis use and unconventional beliefs could also reflect that individuals electing to use cannabis tend to be unconventional or eccentric in behavior and beliefs compared to their peers (Earleywine, 2006; Morrison et al., 2009). With respect to understanding the link between schizotypy and cannabis use however, the established literature is limited because it

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does not differentiate clinically-meaningful schizotypy from sub-threshold unconventional beliefs.

A second knowledge gap concerns the degree to which cannabis use is problematic for individuals with schizotypy, and the degree to which these problems affect interest in treatment. In the larger population cannabis use is associated with a host of psychological, neurocognitive and functional maladies (Agosti et al., 2002; Hayatbakhsh et al., 2007; Reilly et al., 1998; Thomas, 1996). Despite this, treatment interest is generally low (Buckner et al., 2010; Cunningham, 2005). In patients with schizophrenia, cannabis use is associated with a range of maladies, including increased hospitalizations, the need for increased antipsychotic dosages, exacerbation of positive and disorganization symptoms, and increased cognitive problems (Caspari, 1999; D'Souza et al., 2005; Dixon, 1999; Negrete et al., 1986). Moreover, cannabis use is a negative prognostic indicator for treatment for patients with schizophrenia (Dixon, 1999). The question of whether cannabis use is associated with functional impairment and treatment in schizotypy has received minimal attention. One would expect that individuals with schizotypy would experience greater cannabis-related problems compared to the general population, as schizotypal individuals already experience a range of neurocognitive, psychosocial and psychiatric concerns (e.g., Cohen et al., 2006) that would presumably be exacerbated with cannabis use. The present study also examined the degree to which individuals with schizotypy are interested in treatment for cannabis use or other psychiatric concerns, and how treatment interest is affected as a function of cannabis use.

A third knowledge gap concerns schizotypy heterogeneity. Similar to schizophrenia, schizotypy is a dramatically heterogeneous phenomenon and there are no known biological, neurocognitive, symptom or behavioral markers present in all cases. Thus, an important question concerns elucidating which traits of schizotypy are most strongly related to cannabis use, and conversely, which schizotypal aspects are inversely related to cannabis use. In patients with schizophrenia, cannabis use appears related to more severe positive and less severe negative symptoms (Compton et al., 2007; D'Souza et al., 2005; Potvin et al., 2006). These findings have generated interesting theories that cannabis use relieves negative symptom severity (Potvin et al., 2006) and alleviates negative affect (Green et al., 2004) and that cannabinoid receptors play a role in positive symptoms (D'Souza et al., 2005). In schizotypy, greater cannabis use has been correlated to less negative and greater severity of positive and disorganization traits (Esterberg et al., 2009; Nunn et al., 2001; Schiffman et al., 2005). As noted above however, these findings are difficult to interpret because schizotypy was defined dimensionally such that few of the subjects had clinically-meaningful schizotypal.

The present study examined these three knowledge gaps in a large non-psychiatric young adult population. Young adults were examined because this age range is particularly vulnerable to cannabis use and use-related problems (Administration, 2006; Johnston et al., 2007). The sample was trichotomized based on scores on a measure of schizotypal traits into separate groups: "schizotypy" − reflecting individuals showing prominent schizotypal traits, "non-schizotypy" − reflecting individuals who, according to the literature (Raine, 1991; Lenzenweger and Korfine, 1992), were very unlikely to be schizotypal, and "unconventional" − reflecting individuals who endorsed some schizotypal-like experiences/behaviors but whose pattern of scores fell below that considered schizotypy. Grouping in this manner directly addresses concerns that the results of prior studies were largely driven by "unconventional" individuals who were not schizotypal in nature.

2. Methods

2.1. Participants

Participants were undergraduate freshman and sophomore students at a large public university in Southern Louisiana who were approached via email to participate in an on-line survey and offered a chance to win one of 10 monetary prizes ($25) for participating. Of the 7951 students invited to participate, our response rate was approximately 27% ($n = 2145$). Twenty-one percent of these questionnaires were discarded because they were incomplete ($n = 467$) or invalid ($n = 13$) defined as responding abnormally to three or more of four questions from the Infrequency Scale (Chapman and Jean, 1976) − e.g., "I believe that most light bulbs are powered by electricity". The final sample comprised 1665 (64.4% female) students with a mean age of 19.29 (SD = 3.74). The racial/ethnic composition of the sample was as follows: 7.7% African American, 4.3% Asian, 7.2% American Indian, 77.4% Caucasian, and 3.4% Hispanic/Latino. The survey included a consent form, basic demographic questions, and the below measures of schizotypy and cannabis use. The university's Human Subject Review Board approved this study and informed consent was obtained prior to administration of assessments.

2.2. Schizotypal symptoms

The Schizotypal Personality Questionnaire-Brief Revised (Cohen et al., in press-b) measured schizotypal traits. The SPQ-BR has excellent internal consistency, a coherent factor structure, and demonstrated external validity in a large sample of healthy adults (Cohen et al., in press-b). The SPQ is comprised of 32 items selected from the original SPQ (Raine, 1991) that cohere into seven empirically-derived subscales. The SPQ-BR employs a five-point likert scale system that has been employed in recent SPQ research (Wuthrich and Bates, 2005). Response options ranged from "Strongly Disagree" to "Neutral" to "Strongly Agree". A super-ordinate four-factor solution has been confirmed in prior research (Cohen et al., in press-b), comprising Cognitive-Perceptual (i.e., ideas or reference/suspiciousness, magical thinking and unusual perceptions), Disorganized (eccentric behavior, odd speech), Social Anxiety and Negative (i.e., no close friends, constricted affect) traits. In light of evidence that the Social Anxiety factor is largely secondary to core schizotypy pathology (Lewandowski et al., 2006; Cohen et al. in press-b, Cohen & Matthews, 2010) and to reduce the total number of analyses examined in this study, we omitted this factor.

Informed by a) Meehl's theories of schizotypy (Meehl, 1962), b) taxometric studies suggesting a 10% population incidence of schizotypy (Lenzenweger and Korfine, 1992), and c) findings that over half of individuals in the top 10% of SPQ scorers met criteria for a schizophrenia-spectrum disorder (Raine, 1991), we developed a system for categorizing subjects into three groups based on level of confidence of schizotypy taxon membership. These groups included a "Non-schizotypy" group − comprised of individuals without schizotypal traits (i.e., SPQ-BR scores below the 50th percentile), a "Schizotypy" group − comprised of individuals with prominent schizotypy traits (i.e., SPQ-BR scores above the 95th percentile), and an "Unconventional" group (i.e., defined as cases between the 50th and 85th percentile). The "unconventional" group is meant to capture individuals reporting eccentric traits in some regard (as evidenced by above average SPQ-BR scores) but whose scores were not extreme enough to be considered schizotypal. Individuals with scores between the 85th and 95th percentile were judged to be questionable in terms of categorization and were excluded from the group analyses. Although there are no criteria established in the literature to differentiate these three groups, we are confident that