

# **NATURAL RECOVERY OF PEOPLE WITH CANNABIS USE AND PSYCHOSIS**

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Cannabis, comorbidity, first-episode, natural recovery, psychosis, recovery, self-management, schizophrenia, substance use, substance use disorder.

# Abstract

The high rates of cannabis use (CU) among people with psychosis, and its negative biological, psychological and social consequences are well established. However, current treatment approaches to substance use (SU) in people with psychosis have shown mixed and poor long-term results. Further research aimed at increasing clinical understanding of the relationship between SU and psychosis is required to guide the development of more innovative and effective treatments for this population. A growing number of studies examining reasons for CU among psychotic populations have provided insights into the development of treatment strategies aimed at boosting motivation. However, treatment research is yet to capitalize on how up to a third of people with psychotic disorders ‘naturally’ reduce their consumption of cannabis after experiencing a psychotic episode.

This thesis investigates how people with psychosis naturally recover from CU. The first study conducts a systematic review of the literature of natural recovery and SU (Chapter 2). The systematic search elicited 7 studies which met search criteria. Overall the limited number of studies indicated a void in this research field and the need to address this to improve current understanding of naturalistic recovery of SU in people with psychosis. The review then compared the results with reviews on natural recovery from SU in the general population. Limited differences were noted between the groups, with difference in the SU group being related to the psychotic illness and subsequent consequences (i.e., functional problems).

Chapters 3 and 4 provide estimates of change in control groups of RCTs of SU treatment studies for the general population and psychotic individuals using meta-analysis. Both studies found 8 articles that met inclusion criteria. Reduction in days of CU/SU was measured by use in the past 30 days. For the general population group average weighted mean days of use reduced from 24.5 to 19.9, and a meta-analysis showed an average reduction of 0.442 SD across 2-4 months. In the psychosis group weighted mean days of use reduced from 13.2 to 10.6 at 6 months, and a mean reduction of 0.3-0.4 SD across 6 to 24 months was found. The results of Chapter 3 and 4 provide a baseline for assessment of required treatment effects and strengthen the concept of natural recovery.

In Chapters 5 and 6, two existing data sets are then examined, to explore predictors of natural recovery from SU in psychosis. Chapter 5 uses data on 786 patients with first episode

psychosis (FEP) treated at The Early Psychosis Prevention and Intervention Centre (EPPIC) in Australia. The study aimed to identify baseline predictors of reduction or cessation in SU in this sample over an 18-month follow-up. Results from multivariate analysis found that CUD alone and better premorbid social and occupational functioning were significant predictors of SU cessation/reduction. Chapter 6 uses data on 67 consecutively admitted patients between the ages of 18 and 40 with early psychosis. Predictors of cannabis cessation over a 6-month follow-up were identified, using more detailed and frequent assessments of CU than the study in Chapter 5. Multivariate analysis reported that living in private accommodation and receiving an income were significant predictors of CU cessation.

Chapter 7 and 8 provide data on motivators for cessation/reduction, maintenance strategies and relapse contexts. Chapter 7 presents a qualitative study that retrospectively explores both reasons for ceasing or reducing CU and the strategies used by 10 people with a psychotic disorder who had ceased or reduced CU for at least a month in the previous 3 years. Increased awareness of the consequences of SU across multiple domains, social supports and utilising a combination of coping strategies were important in motivating cessation/reduction. Factors which assisted in maintaining control of CU included the ability to manage mental health symptoms, while the capacity to address pressure from substance using peers was commonly mentioned relapse strategy.

Chapter 8 addresses the limitations of recall bias in Chapter 7 by prospectively examining reasons for cessation/reduction in CU among 22 individuals with psychosis who had ceased or reduced their use. Participants were followed-up over a 3-month period to identify changes in CU. Reasons for initiating cessation/reduction included worsening mental health, relationship, lifestyle difficulties. Maintenance strategies identified psychological, relationship, lifestyle and medication themes. Relapse was associated with substance-using peers, relationship difficulties and problems with negative emotions.

Results of this program of research provide a valuable contribution to the literature on CU and psychosis and more broadly SU and severe mental illness (SMI). They highlight specific factors (i.e., addressing mental health issues) for clinical focus in the initial change of CU, maintenance of a reduction/cessation of CU and strategies to assist with relapse. The thesis argues that there is an ongoing need for exploration of natural recovery, in order to develop ways to further improve treatments.

# Submitted Manuscripts and Publications from the PhD Program

## Paper 1

**Rebgetz, S.,** Kavanagh, D. J. & Hides, L. (2015). Can exploring natural recovery from substance misuse in psychosis assist with treatment? A review of current research. *Addictive Behaviors*, 46, 106-112. doi:10.1016/j.addbeh.2015.03.006 Journal Impact Factor = 2.76. Accepted 7 March 2015.

## Paper 2

**Rebgetz, S.,** Kavanagh, D. J. & Hides, L. (2015). Systematic analysis of changes in cannabis use among control conditions of randomised controlled trials. *Addictive Behaviors Reports*, 1, 76-80. doi:10.1016/j.abrep.2015.06.001. Accepted 1 June 2015.

## Paper 3

**Rebgetz, S.,** Kavanagh, D. J. & Hides, L. (2016). Changes in cannabis use among psychotic clients without specialised substance use treatment. *Schizophrenia Research*. doi: 10.1016/j.schres.2016.03.030. Journal Impact Factor = 3.92. Accepted 24 March 2016.

## Paper 4

**Rebgetz, S.,** Conus, P., Hides, L., Kavanagh, D. J., Cotton, S., Schimmelmann, B. G., McGorry, P. D. & Lambert, M. (2014). Predictors of substance use reduction in an epidemiological first-episode psychosis cohort. *Early Intervention in Psychiatry*, 8, 358-365. doi: 10.1111/eip.12067. Journal Impact Factor = 1.95. Accepted 20 May 2013.

## Paper 5

**Rebgetz, S.,** Hides, L., Kavanagh, D. J., Dawe, S. & Young, R. M. (2014). A prospective study of natural recovery from cannabis use in early psychosis. *European Journal of Psychiatry*, 28, 218-229. doi: 10.4321/S0213-61632014000400003. Journal Impact Factor = 0.46. Accepted 15 October 2014.

#### Paper 6

**Rebgetz, S.,** Hides, L., Kavanagh, D. J. & Choudhary, A. (2015). Natural recovery from cannabis use in people with psychosis: A qualitative study. *Journal of Dual Diagnosis*, *11*, 179-183. doi: 10.1080/15504263.2015.1100472. Journal Impact Factor = 0.80. Accepted 12 October 2015.

#### Paper 7

**Rebgetz, S.,** Hides, L., Kavanagh, D. J. & Choudhary, A. (2016). Prospective recovery of cannabis use in a psychotic population: A qualitative analysis. *Addictive Behaviors Reports*. Accepted 16 July 2016.

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# List of Abbreviations

BPRS	Brief Psychiatric Rating Scale
CBT	Cognitive Behaviour Therapy
CU	Cannabis Use
CUD	Cannabis Use Disorder
EP	Early Psychosis
FEP	First Episode Psychosis
MI	Motivational Interviewing
RCT	Randomised Control Trial
SMI	Severe Mental Illness
SU	Substance Use
SUD	Substance Use Disorder
UCLA	University of California, Los Angeles

# Statement of Original Authorship

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

QUT Verified Signature

Signature:

Date: 09/11/2016

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# Chapter 1: Overview and Literature Review

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## 1.1 OVERVIEW

It is now evident, through research and clinical practice, that cannabis use (CU) is widespread among individuals with psychosis and has a negative impact on social, occupational, and treatment outcomes in this population (2015). Individuals presenting with psychosis and substance use (SU) can be difficult to engage in treatment and have poor treatment outcomes compared to those presenting with psychosis alone (Hjorthøj, Fohlmann, & Nordentoft, 2009; Lambert et al., 2005). Research over the last two decades has clearly shown that integrated treatments for co-occurring disorders have superior impact than non-integrated approaches, and that motivational components are beneficial. However, it is important to note that trials comparing best practice treatments with control conditions have not been able to consistently replicate findings of substantially superior differential effects across substances and over time (e.g., Hjorthøj, et al., 2009; Kavanagh, Young, et al., 2004; Lambert, et al., 2005). A greater understanding of how individuals recover naturally from SU and psychosis is expected to aid in the refinement of current treatment protocols and improve findings. The aim of this research program is to fill this knowledge gap, by exploring natural recovery from CU (and more broadly, SU) among individuals with psychosis.

### 1.1.1 Overview of the PhD Research Program

This thesis by publication used quantitative and qualitative methods to develop an understanding of process of natural recovery from CU in individuals with psychosis. This chapter provides an overview of the program of research undertaken in this PhD, as well as a review of the existent literature on self change in SU among individuals with psychosis.

This thesis aimed to identify what variables and processes are involved in cessation/reduction of CU among individuals with psychosis. Specifically, the research sought to identify:

What triggers the decision to initiate a change and what are the associated reasons for reducing/ceasing CU among substance users with psychosis?

What maintains cannabis cessation among substance users with psychosis?

What predicts lapses in control, and what strategies are most commonly used to regain control among substance users with psychosis?

These aims were explored across seven papers. Paper 1 conducted a systematic review of the literature on natural recovery from SU, which is presented in Chapter 2. A meta-analysis (Paper 2) of control conditions of treatment trials receiving no or limited intervention in psychotic populations is presented in Chapter 3. Findings from this meta-analysis included the identification of a baseline for likely changes in CU, which can inform future treatment trials. Paper 3 systematically explored the literature on natural recovery from CU among individuals in the control conditions of treatment trials receiving no or limited intervention in the general (See Chapter 4) population. Papers 4 to 7 comprised a series of natural recovery studies, all of which aimed to guide the refinement, and increase the effectiveness of interventions for SU in psychosis. Papers 4 and 5 used two existing prospective data sets to explore natural recovery from SU among treated and untreated people with psychosis. Paper 4 explored factors associated with substance cessation/decline (See Chapter 5), and paper 5 identified factors that predicted cessation of CU over 6 months (See Chapter 6). Paper 6 utilised qualitative methodology to retrospectively explore the reasons for ceasing or reducing CU among a new sample of people with a psychotic disorder (See Chapter 7). Results of Paper 6 informed the development of paper 7, which explored natural recovery from CU among a sample of people with psychosis over a 3-month period (See Chapter 8). Figure 1.1 shows the sequence of stages involved in the research program.



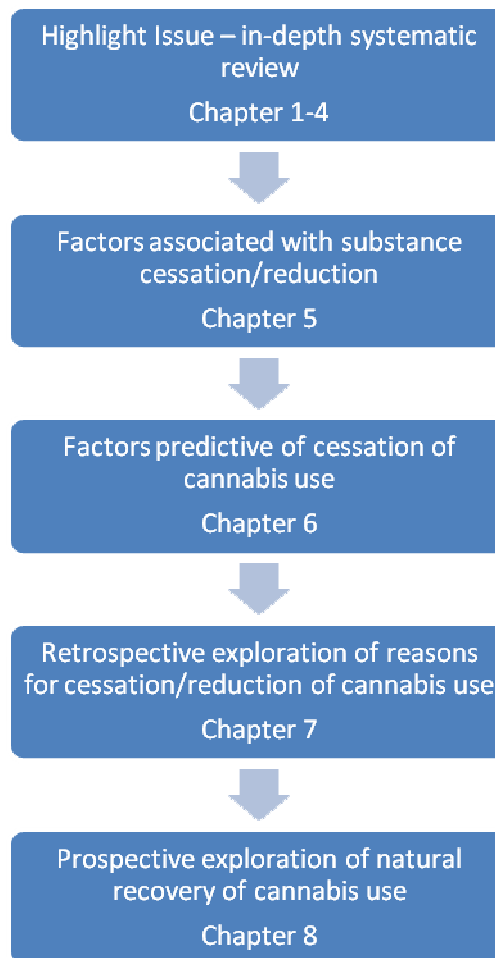


Figure 1.1 Overview of the PhD project.

Overall, the thesis aimed to develop a greater understanding of people’s self-change in CU, which in turn can guide design of more effective treatments to support reductions in CU and assist in relapse prevention and control strategies.

## 1.2 PSYCHOSIS AND CANNABIS MISUSE

People with psychosis have higher lifetime rates of SU than the general population, with rates of 40-50% reported (Degenhardt, Hall, & Lynskey; Hjorthøj, et al., 2009; Pourmand, Kavanagh, & Vaughan, 2005). For example, studies in the US and UK have both found an incidence of substance use disorders (SUDs) of 47% in people with psychosis, compared with 13.5% of the general US population (Barrowclough, Haddock, Fitzsimmons, & Johnson, 2006; Korkeila et al., 2005). In the general population, young people have particularly high rates of SU, but even in this age group, people with first episode psychosis (FEP) have heightened rates of SU (Bendall et al., 2008; Cassidy, Schmitz, & Malla, 2008;

Hides, Dawe, Young, & Kavanagh, 2007). Australia has high rates of CU in the general population (35% of the general population) and cannabis is the most commonly used illicit substance among people suffering from FEP and as a result was chosen as the main substance of focus during this project (Australian Institute of Health and Welfare, 2014; Cassidy, Schmitz, & Malla, 2008).

### **1.3 IMPACT OF SUBSTANCE MISUSE**

SU can trigger the onset of psychosis in at-risk individuals, with those who use cannabis before being 1.4 times more likely to develop a psychotic illness (Moore et al., 2007). Cannabis users with psychosis have been found to have a younger age of onset of psychosis than non-substance users, as well as a greater number of positive symptoms and more severe depression than non-cannabis users. There is a dose-response effect in the increased risk of psychosis with those who use cannabis frequently (2.09, 1.54-2.84), and the effect remains (albeit diminished) when the effects of potential confounding variables (e.g., having parents who had divorced) are controlled (Andreasson, Allebeck, Engstrom, & Rydberg, 1987; Hall & Degenhardt, 2000; Moore, et al., 2007).

Problems with SU remain after the onset of psychosis. People with psychosis and a comorbid SUD have poorer functional outcomes, worse global functioning and increased severity of psychotic symptoms than those without comorbidity (Pencer & Addington, 2008; Seddon et al., 2015; van der Meer, Velthorst, & Generic Risk and Outcome of Psychosis (GROUP) Investigators, 2015). In particular, SU has a substantial negative impact on vocational and social learning, and role transitions that occur in adolescence and young adulthood (Pencer & Addington, 2008). Additional ill effects include increased rates of treatment noncompliance, relapse, distorted perception and cognition, suicidal ideation, social exclusion, homelessness, aggression, incarceration, injury, HIV, hepatitis, and cardiovascular, liver, and gastrointestinal disease (Cleary, Hunt, Matheson, Siegfried, & Walter, 2008b; Drake, Mueser, Brunette, & McHugo, 2004; Horsfall, Cleary, Hunt, & Walter, 2009). Individuals with psychosis and comorbid SU have significantly higher hospital readmission rates, poor medication compliance and a poorer overall prognosis (Archie et al., 2007; Barrowclough, et al., 2006). It is not only people with psychosis who use cannabis heavily who run these risks of symptom exacerbation; people who use cannabis irregularly or in minimal amounts are also at increased risk of relapse to CU (Lobbana et al., 2010). These

results certainly suggest that psychosis may increase a person's sensitivity to the deleterious effects of cannabis.

SU greatly impacts on mental illness and this leads to a substantial effect on health services. For example, SU has been associated with reduced medication effectiveness and increase in psychotic symptoms (Thornton et al., 2012; Ziedonis & Nickou, 2001). All the above impacts on the cost to health care with individuals with psychosis and SU increasingly using psychiatric hospitals, emergency medical care and general practitioner care (Thornton, et al., 2012; Ziedonis & Nickou, 2001). It is therefore important that research strives to refine and improve intervention and prevention strategies.

#### **1.4 REASONS FOR USE**

Research on reasons for CU among psychotic populations has provided some insight into the factors that maintain SU despite its negative effects. An increased understanding of the reasons people use cannabis may also inform the development of more effective treatments. To date, it appears people with psychosis choose to use substances to relieve a variety of non-psychotic experiences (Kolliakou et al., 2015; Noordsy et al., 1991; Thornton, et al., 2012). Alcohol, cannabis and cocaine are used to decrease depression, and cannabis and alcohol are used to decrease anxiety (Dixon, Haas, Weiden, Sweeney, & Frances, 1991). Individuals with psychosis generally endorse relaxation/social motives, pleasure and coping with unpleasant affect (Kolliakou, et al., 2015; Thornton, et al., 2012). Nonetheless, expectancies do not always mirror experiences; for example, a study using Q methodology<sup>1</sup> in a group of people with chronic schizophrenia found that patients did not actually gain much symptom relief via their SU (Addington & Duchak, 1997). Gregg and colleagues (2009) found that the most commonly endorsed reasons for SU in people with schizophrenia and other psychotic disorders were: when I want to chill out or relax (94.3%), when I am feeling stressed (90.4%), and when I am bored and want something to do to pass the time (89.6%). They also found that 50.9% of participants used substances to cope with or reduce auditory hallucinations, and 57.4% to abate feelings of suspiciousness or paranoia (Gregg, et al., 2009). Specifically exploring the role of cannabis and psychosis, Thornton (2012) concluded cannabis was used for pleasure. Recently, Mane and colleagues (2015) exploring the relationship between<sup>1</sup> cannabis and psychosis in FEP cannabis users found reasons to use

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<sup>1</sup> Q Methodology is a research method used to study people's "subjectivity"—that is, their viewpoint. It is used both in clinical settings for assessing a patient's progress over time (intra-rater comparison), as well as in research settings to examine how people think about a topic (inter-rater comparisons).

were associated with helping arrange thoughts and dealing with hallucinations and suspiciousness.

Reasons for SU in people with early psychosis appear to be slightly different. For example, a sample of 18-30 year olds with FEP and comorbid SU endorsed the following reasons for use through their responses on the reasons for use scale: to relieve boredom, something to do with friends, to help them feel less anxious, and to feel more relaxed (Pencer & Addington, 2008). Understanding processes around why individuals with psychosis continue to use substances when little relief is in fact received could greatly assist in the design of effective treatments.

Baker and colleagues have consistently suggested that different treatment approaches may be required for different substance groups (Baker, Turner, Kay-Lambkin, & Lewin, 2009) and therefore specifically exploring cannabis alone could assist in improving interventions. In addition they have suggested that intervention needs to be tailored to the specific psychiatric disorder and taking into account the above differences, consideration needs to be taken for interventions at different phases of psychotic illness (i.e., early psychosis versus chronic) and different types of psychotic illness (Thornton, et al., 2012).

## **1.5 TREATMENT OF SUBSTANCE USE IN PSYCHOSIS**

Clinical experience suggests that people with psychosis are difficult to engage in treatment (Addington & Addington, 2007). Clinical trials examining the efficacy of SU treatment in people with psychosis have generally inconsistent and limited results (Cleary, et al., 2008b; Hjorthøj, et al., 2009; Kavanagh & Mueser, 2007; Lambert, et al., 2005). Exploring treatment in previously homeless individuals with dual diagnosis Henwood and colleagues (2012) concluded that SU improvements were seldom linked to therapeutic interventions. Treatments have typically involved multiple components (e.g., cognitive behaviour therapy, motivational interviewing, behavioural interventions, family interventions) and studies seeking to identify which strategies contribute to change have not yet been attempted. The only treatment component that has demonstrated an independent impact is motivational intervention (MI), and even then, the impact has primarily been on longer engagement in treatment, rather than treatment outcome (Mueser, Kavanagh, & Brunette, 2007). Recently, Hjorthøj and colleagues' (2014) systematic review and meta-analysis concluded that MI showed a reduction in the quantity however not the frequency of

CU. They suggested that given the nature of MI, it is unlikely to change the frequency and other effective treatments are required.

The limited impact of psychosocial treatments is further highlighted by an RCT of 130 participants with a diagnosed psychotic disorder and coexisting problems with SU compared a MI/cognitive behaviour therapy (CBT) treatment group with treatment as usual (Baker et al., 2006). The treatment group received ten 1-hour sessions on a weekly basis, with sessions 1-4 focusing on MI and sessions 5-10 focusing on CBT. Results suggested only short-term benefits (at 15 weeks), and there were no significant differences between the two groups in SU or abstinence rates at 12-month follow-up (Baker, et al., 2006). Similar results were reported in a RCT examining the effectiveness of CBT for schizophrenia and SU (Haddock et al., 2003). This would suggest that MI and CBT techniques provide short term reductions in SU, but few long-term treatment gains. The potential long-term efficacy of other therapies has also been examined, with similar results. For example, the trial of MI, CBT, and family intervention by Barrowclough et al (2006) showed modest but statistically significant results at the end of treatment and at 9-12 month follow-up, but these effects lost significance at an 18-month follow-up. Recently, Barrowclough and colleagues have provided evidence and a framework to include families in the treatment of SU and psychosis with potentially promising results, however further exploration is required (Lobban & Barrowclough, 2016; Smeerdijk et al., 2014)

Exploring the wider evidence to gain further insights into the effectiveness of current interventions found few differences. A review of 25 RCTs on severe mental illness (SMI) and SU suggested that individual (i.e., one on one therapy) MI and CBT was no more effective than standard care in reducing SU, retaining participants in treatment, or preventing relapse (Cleary, Hunt, Matheson, Siegfried, & Walter, 2008a). It was concluded that there was no convincing evidence to support the efficacy of one psychosocial treatment (i.e., MI + CBT, CBT alone, skills training) over another. The studies included in the review used very different methodologies (e.g., choice of measure, inconsistent inclusion and exclusion criteria) which hinder interpretation of the meta-analysis.

The mechanisms of change in MI and CBT treatments are poorly understood. Furthermore, there is limited understanding of the interaction between SU and psychosis, and how this impacts on individuals' motivation to make a change in their SU (Barrowclough, et al., 2006). For example, Lobanna and colleagues (2010) reported that motivation to change increased following a psychiatric inpatient admission, but tends to fluctuate in frequency and

intensity over time. It is possible that an increased targeting of the specific mechanisms underlying motivation to change may increase the effectiveness of interventions. An increased understanding of differences in the patterns of SU at different ages and different stages of psychosis, as well as the motivating and maintaining factors of change in SU, may also enhance treatment (Lobbana, et al., 2010).

Integrated dual diagnosis programs which address both the SU and psychosis components have been found to be superior to either intervention in isolation (Drake, O'Neal, & Wallach, 2008). Despite the above mentioned limited effectiveness to date, integrated programs are the standard treatment for individuals with psychosis and SU. The components which are important in the recovery of SU are not well understood (Davidson & White, 2007; Horsfall, et al., 2009). Current approaches appear to be integrating non-traditional SU treatments. For example, the NAVIGATE program is a team-based, multicomponent treatment program which can be incorporated into routine mental health services (Mueser et al., 2015). The aim of the program is to assist people with FEP (and their families) toward psychological and functional health. The multicomponents include family education, individual resiliency training, supported employment and education, and individualised medication treatment. The philosophy of the program is a shared decision-making approach which highlights a recovery model including collaboration with the entire system in treatment planning and reviews (Mueser, et al., 2015). Using individuals' experiences of natural recovery may assist in fine tuning such specialised services.

It has been suggested that the limited results found in the current literature may be due to the short nature of the interventions provided and longer interventions required given the complexity of SU and psychosis (Baker, Hides, & Lubman, 2010; Barrowclough et al., 2014). Only one RCT has been conducted on longer term interventions to date. 110 participants were randomly allocated to short-term MI-CBT, longer-term MI-CBT up to 24 sessions over 9 months or treatment as usual. The authors concluded that there was no benefit in either intervention in relation to frequency or amount of cannabis used (Barrowclough, et al., 2014).

## **1.6 RELAPSE OF SUBSTANCE USE**

A large number of studies have focused on understanding predictors of a poor clinical course and relapse in SU. Current models of relapse for SU focus on the interaction between situational risk factors and individual characteristics. From a CBT framework, self-efficacy,

coping, and the relapse context interact to determine whether a person will use or resist from using. Marlatt and Gordon's (1980) taxonomy of relapse situations incorporated both intrapersonal and interpersonal factors. Initial studies on substance abusing adults found that intrapersonal factors, particularly negative emotional states, predicted return to use following abstinence. In contrast, studies on adolescents reported the major reason for initial use following treatment was direct social pressure in interpersonal settings (Brown, Vik, & Creamer, 1989).

However, a general population study of adolescent and adult relapse, found that adults were most likely to relapse in negative intrapersonal states (66.9%) or in other intrapersonal states (95%) (Ramo & Brown, 2008). The latter included coping with urges or temptation both in the presence (55%) and absence of cues (26%). Adolescent participants had similar relapse rates for negative intrapersonal states (64.4%) and other intrapersonal states (86.7%). Compared to adults, adolescents were most likely to relapse when experiencing a positive emotional state (41%) and when giving into temptations in the presence of cues (37.2%). As relapse is likely to involve contextual factors, research needs to be mindful to include environmental contexts (Drake, Wallach, & McGovern, 2005).

It is therefore clear that a further understanding of relapse contexts for those with CU and psychosis is needed. There has been limited focus on relapse of SU in people with psychosis and SMI. Findings indicate that individuals with SU and psychosis are likely to relapse in regards to their SU even once they are in remission (Drake, et al., 2005). Relapse is associated with exacerbations of mental illness, social pressures within drug-using networks, lack of meaningful activities and social supports for recovery, independent housing in high-risk neighbourhoods, and lack of substance abuse or dual diagnosis treatments (Drake, et al., 2005). Understanding the different contexts across stages of illness and in different age groups may also be important for optimal treatment design.

## **1.7 PSYCHOSIS RELAPSE**

Previous research has identified difficulties with a clear definition of psychosis relapse, and numerous recommendations have been made for the appropriate definition of this concept (Falloon, Marshall, Boyd, Razani, & Wood-Siverio, 1983). The UCLA criteria for psychotic relapse has been widely used over recent years and is considered the most robust measure (Hides, Dawe, Kavanagh, & Young, 2006). The definition is clinician-rated using

the Brief Psychiatric Rating Scale (BPRS; Overall & Gorham, 1962) and defined as elevation on a BPRS remitted psychotic symptom to  $\geq 6$  for a 1 week period (Hides, et al., 2006).

In samples with psychosis, consideration also needs to be given to the context in which relapses in psychotic symptoms occur. Relapse contexts are likely to differ between psychotic populations with and without a SUD, indicating the two groups may require different relapse prevention strategies (Drake, et al., 2005). Those with a SUD have more severe mental health problems, as well as pervasive cognitive (i.e., reduced effectiveness of learning new skills) and social dysfunction (i.e., isolation and victimisation) that needs to be addressed in treatment.

There is evidence to suggest that psychotic relapse risk increases with increased CU (Hides, et al., 2006). It is also considered the strongest predictor of relapse of psychosis. In turn, cannabis relapse was also predictive of psychosis relapse which suggests a bidirectional relationship (Hides, et al., 2006). Exploring the relationship between CU and psychosis has suggested that those who continue to use cannabis compared to those who cease or reduce their use have increased episodes of psychotic relapses (van der Meer, et al., 2015). Due to this relationship, it is important to consider psychotic symptoms and potentially other mental health symptoms in the context of cannabis relapse and maintenance.

## **1.8 NATURAL RECOVERY IN SUBSTANCE USE**

‘Natural recovery’ in the literature is defined as a process of initiating and sustaining recovery, without professional intervention or involvement in a self-help/12-step group. It is defined as reductions or remission of SU over time periods ranging from 3-4 months to over 18 months. Research on the natural course of recovery from SU among populations suggests it has a variable and often fluctuating course. A large proportion of individuals who use cannabis cease by their mid-thirties and the most successful cessation occur without treatment (Chen & Kandel, 1998; Cunningham, 2000; Price, Risk, & Spitznagel, 2001). Studies on natural recovery from alcohol, heroin and cocaine abuse have shown that many individuals can change their drug use when the benefits of use are outweighed by the negative impact (Toneatto, Sobell, Sobell, & Rubel, 1999). This cognitive re-evaluation of the costs and benefits of use is a critical process in natural recovery (Mohatt et al., 2008). A better understanding of the natural recovery process from SU in people with psychosis is important, as it would allow a better understanding of behaviour change in this specific population.



Exploring the research on natural recovery in SU among the general population may shed light into recovery efforts for individuals with psychosis. Although a large proportion of SU in the general population cease over time, little is known about the prevalence of those who cease smoking each year. Toneatto and colleagues (1999), in their study of natural recovery from cocaine dependence, found that the most commonly reported negative consequences of use were interpersonal problems including the negative impact on one's self-concept. The study concluded that cognitive evaluation was the main reason for ceasing use. Other reasons for ceasing cocaine use included: external pressures or an ultimatum from significant others, financial problems, health problems, tired of using, lifestyle, fear of continued use, and observation of effect of use on others. The study reported that the most important factors in maintaining change were an improvement in self-concept, change of friends, change in social life, avoidance of social situations in which use may occur, support from significant others, change in drug use, change of address, and change in job. The study did not explore the process by which individuals made the decision to engage in these maintaining factors, which would be of interest in treating people with psychosis and substance misuse. The most frequent triggers for urges were reported to be substance-related stimuli, with the most common being the recall of pleasant effects of the substance, talking about the use of substances, and being in the presence of the substance or someone using the substance. Negative mood states and boredom were also reported as triggers for urges to use. Cognitive coping strategies were the most commonly reported coping behaviours for urges, while the most common responses for not resuming use were the awareness of the negative consequences of use, lack of desire or need, and having an incompatible lifestyle with SU.

In conclusion, research on natural recovery from SU has indicated that cognitive re-evaluation of the costs and benefits of use are a critical process in natural recovery. Increased understanding of such natural recovery from SU in psychosis may provide valuable insights into potential treatment targets to reduce CU in this vulnerable population. Research in this area would potentially impact on designing self-change strategies, improving formal treatment, developing effective intervention strategies, and contributing to the knowledge of the natural history of cannabis use disorder (CUD) in psychosis (Watson & Sher, 1998). As very little is known about long-term recovery, natural recovery studies could be very valuable for tracking its stability over time.

## **1.9 MAINTENANCE**

No known research has specifically explored what factors maintain cannabis cessation in individuals with psychosis. Research among people with schizophrenia and SU found 7 out of 17 participants who were currently abstinent had intentions to continue abstinence (Asher & Gask, 2010). Reported reasons for maintaining abstinence were disliking the negative effects of cannabis, problems with the law, improved finances, becoming older, physical health, insight into the link between use and mental health symptoms, support from others and hope for change in personal circumstances (e.g., relationships, employment, accommodation). Another study which reported possible reasons for maintenance found that the role of protective and supportive friends or family stopped participants from using again. It is clear that further research is required in this area to improve longer term abstinence/reduction in SU.

Research on natural recovery studies from SU have found that similar reasons for initial change appear to also serve maintenance factors. In a recent review of natural recovery studies from 1999 to 2005, Carballo and colleagues (2007) found that maintenance factors were reported by 59.1% of all studies. The two most commonly mentioned maintenance factors were social support and family support, as reported in 54.5% and 45.5% of studies, respectively. The reviewers highlighted that these two factors were also the most common in the first natural recovery review (Sobell, Ellingstad, & Sobell, 2000). Other factors reported in the review included avoidance of substance-use situations (36.4%), self-control (31.8%) and religion (34.6%).

### **1.10 EXTENT OF NATURAL RECOVERY IN CONTROL GROUPS**

Most puzzling is evidence from RCTs suggesting that substance users with psychosis in assessment only or minimal treatment conditions achieve similar reductions in SU over time to those in more active treatments. ‘Control groups’ could be suggestive of natural recovery where no formal treatments are provided. Exploration of these control groups may offer further insight into factors that influence recovery.

Reviewing the literature of RCT’s for SU treatment in people with psychosis has found people in the control groups make substantial recovery gains. The First Episode Psychosis Outcome Study (FEPOS) study conducted at the Early Psychosis Prevention and Intervention Centre (EPPIC) in Melbourne, Australia consisted of 786 FEP patients. Lambert et al. (2005) reported that the lifetime prevalence of CU was 74.1% (n = 463), baseline prevalence was

61.6% (n = 385) and follow-up (18 months) was 36.9% (n = 91). This supports other research which has concluded that some people cease SU without formal treatment ('natural recovery') and possibly before the onset of psychotic symptoms (Addington & Addington, 2001; Archie, et al., 2007; Carr, Norman, & Manchanda, 2009; Harrison et al., 2008; Hinton et al., 2007).

There also appears to be no benefit of speciality care programs for those with SU and psychosis. In a recent review of nine studies without specialised substance abuse treatment and five with specialised substance abuse treatment, all participants across different conditions were able to reduce their SU. Specialised substance abuse treatments did not obtain better rates of abstinence or reduction (Wisdom, Manuel, & Drake, 2011). These findings strongly support a role for natural recovery from SU.

### **1.11 QUALITATIVE DATA ON RECOVERY OF SUBSTANCE USE IN PSYCHOSIS**

Qualitative research exploring the processes of natural recovery from SU in people with psychosis could potentially lead to improvement in current treatments. Lobbana et al., (2010) conducted the first qualitative study exploring natural recovery from SU in a psychotic population. Four overall themes emerged; including, the influence of perceived drug norms, attributions for initial and on-going drug taking behaviour, changes in life goals affecting drug use, and beliefs about the links between mental health and drug use. Changes in personal life goals were often related to an increase in the perceived value of health, disposable income and close family relationships. Similarly, Bennett et al (2009) found that the ability to remit from cocaine dependence in schizophrenia may be reliant on an individual recognising the serious impact of drug use on their life and functioning, limiting problem use to only one drug, and having only one substance class to address. Change appeared to be associated with the recognition that drug use was causing problems, increased number of problems, and making an effort to do things differently.

The differences between people with psychosis who cease cannabis and those that continue to use was explored in a chart review of 206 consecutive inpatients with schizophrenia or related disorders (Dekker et al., 2008). Reported reasons for cessation included an admission, worsening of mental health symptoms, complaints after CU, New Year's resolution, pressure by others, and health related issues. These results were similar to Addington and Duchak's (1997) observations on cessation of alcohol and cannabis. In their study, Addington and Duchak (1997) found that reductions in alcohol use were associated

with a fear of health risks, financial cost, doctor's disapproval, not liking the way they were thinking or acting, parents' or relatives' disapproval, a bad experience, becoming confused, and being hospitalised. Similar reasons were identified for cannabis; including excessive cost, parents' or relatives' disapproval, fear of health risks, doctor's disapproval, becoming paranoid, and being unable to keep a job, remain in school or remain in a treatment program.

Further evidence of themes from natural recovery studies has found a variety of helpful factors. Maisto et al (1999) collected qualitative data through focus groups of 21 participants with schizophrenia and a SUD. Therapeutic factors that were perceived as helpful included individual and group treatments, and self-help or 12-step groups. The main theme across the therapeutic factors was emotional and practical support. Extratherapeutic factors that were helpful included social support, changes in social environment, keeping busy, acute negative experiences or hitting bottom, weighing the pros and cons of quitting versus using, faith, prayer, or meditation, goals, and more effective medication. These results were similar to a study that assessed 25 participants with SMI and alcohol disorder (Stasiewicz, Bradizza, & Maisto, 1997). Among other findings, 48% reported engaging in a cognitive appraisal of the pros and cons of drinking, and 68% reported that a negative life event was associated with the initiation of change.

Research on natural recovery from SU in people with psychosis is in its infancy. Learning from the literature on natural recovery from SU alone is vital in progressing this important field of study forward. Areas of research have pointed to similarities in SU in psychosis and SU alone. These include drugs of choice, patterns of use, and initial reasons for use (Bennett, et al., 2009). While it could be surmised that natural recovery from SU is similar in the psychosis population, it is known that people with psychosis are difficult to treat and have additional and complex illness-related treatment needs (Addington & Addington, 2007; Bennett, et al., 2009). Current treatment design for SU in psychosis has not been guided by a strong body of research on natural recovery. Natural recovery is arguably an important concept for both refining treatments, and increasing their impact (Green, Kavanagh, & Young, 2007; Mueser, et al., 2007).

A series of natural recovery studies could play a vital role in guiding the development of new and more effective interventions for SU in psychosis (Green, et al., 2007; Mueser, et al., 2007). Undertaking a study of a group of people in the early stages of psychosis with comorbid SU is warranted, due to this group potentially having a greater chance of recovery and being relatively free from the confounding effect of suffering from a chronic illness on

functioning. This approach could be inductive in nature and observe individuals that had recovered from SU, exploring the strategies and techniques that aided in this process. Knowledge gained from such research would enable the development of conceptual models of recovery within a comorbid population, instead of generalising from a study of recovery in people with only SU.

### **1.12 COMMENTARY (SUMMARY AND IMPLICATIONS)**

The incidence of CU among individuals with psychosis is high, and associated with negative biological, psychological and social consequences. It is clear that current treatment approaches to SU in individuals with psychosis have yielded mixed, and also less than satisfactory long-term results. Importantly, individuals with psychotic disorders have been found to naturally reduce their CU after a psychotic episode. Further research is needed to learn more about the ‘natural recovery’ from CU among psychotic populations, including the mechanisms underlying this process. Such knowledge is critical for improving current approaches to treatment. A starting point is to specifically explore the state of the literature on natural recovery from CU in individuals with psychosis.



# Chapter 2: Paper 1

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## 2.1 NOTES

### *Citation for this paper:*

Rebgetz, S., Kavanagh, D. J. & Hides, L. (2015). Can exploring natural recovery from substance misuse in psychosis assist with treatment? A review of current research. *Addictive Behaviors*, 46, 106-112. doi:10.1016/j.addbeh.2015.03.006 Journal Impact Factor = 2.76. Accepted 7 March 2015.

### *Authors' contribution to this paper:*

The candidate is the first author and was responsible for conducting the literature search and review; summarising the results of the review; writing the first draft of the manuscript and completing edits based on feedback prior to submission and resubmission. The second and third authors reviewed the summarised results and provided editorial feedback on the manuscript.

### *Overview of this paper:*

This paper was the first review of natural recovery of SU and psychosis. It was able to highlight gaps in the literature particularly the limited exploration of the topic and need for further studies exploring the concept of self-change in SU within people with a psychotic illness.



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3. there are no other authors of the publication according to these criteria;
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Shane Rebgetz QUT Verified 16/08/2016	Conducted literature search and review; summarised the results of the review; wrote the first draft of the manuscript and completed edits based on feedback prior to submission.
David Kavanagh QUT Verified Signature	Reviewed the summarised results and provided editorial feedback on the manuscript.
Leanne Hides QUT Verified Signature	Reviewed the summarised results and provided editorial feedback on the manuscript.

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**Original article**

**Can exploring natural recovery from substance misuse in psychosis assist with  
treatment? A review of current research**

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## **Abstract**

Substance misuse in people with psychosis presents significant problems, but trials of treatments to address it show little sustained advantage over control conditions. An examination of mechanisms underpinning unassisted improvements may assist in the refinement of comorbidity treatments. This study reviewed existing research on natural recovery from substance misuse in people with psychosis. To address this issue, a systematic search identified only 7 articles that fulfilled criteria. Their results suggest that people with psychosis report similar reasons to change as do non-psychotic groups, although they did not clarify whether the relative frequencies or priority orders were the same. Differences involved issues relating to the disorder and the functional problems faced by this group: receipt of treatment for mental health difficulties, worsening of mental health difficulties, and homelessness. The current research on reasons for change in people with psychosis is sparse and has significant limitations, and as yet it offers little inspiration for new treatments. A more fertile source may prove to be a detailed investigation of successful substance control strategies that are used in self-management by this group.

*Keywords:* Natural recovery; psychosis; substance use; comorbidity

## 2.2 INTRODUCTION

Problematic SU is more common in people with psychosis than in the general community, having significant detrimental effects on mental and physical health, and on social functioning (Hjorthøj, et al., 2009; Kavanagh, Waghorn, et al., 2004). While research over the last two decades has shown that integrated treatments for co-occurring disorders have superior impact than non-integrated ones and that motivational components are beneficial, trials comparing best practice treatments with control conditions have not been able to consistently replicate findings of substantially superior differential effects across substances and over time (e.g., Hjorthøj, et al., 2009; Kavanagh, Young, et al., 2004; Lambert, et al., 2005). This observation does not mean that participants show poor improvement rates: rather, studies typically show reductions in SU across conditions. While these effects may represent regression to the mean, they suggest that many people with psychosis stop or reduce consumption of psychoactive substances by themselves, without clinical intervention or treatment. However, this ‘natural recovery’ has received relatively little research attention to date. A review of the current literature on natural recovery is timely due to growing research in this area. A review would allow a consolidation of the current state of the research area and provide future areas of research efforts. ‘Natural recovery’ in this article is defined as a process of initiating and sustaining recovery, without professional intervention or involvement in a self-help/12-step group.

### *Natural Recovery in Substance Abuse*

Natural recovery from substance misuse is common in the general population (e.g. Ellingstad, Sobell, Sobell, Eickleberry, & Golden, 2006; Sobell, et al., 2000). Most natural recovery research has focused on cigarette smoking (Sobell, et al., 2000) and alcohol misuse (mostly exploring alcohol addiction; Ellingstad, et al., 2006; Sobell, et al., 2000), although some studies have focused on illegal drugs. While the course to recovery from substance misuse is variable and fluctuating, many people can reduce consumption or attain abstinence when the perceived benefits of use are outweighed by negative impacts. The number of negative consequences is not necessarily greater (Toneatto, et al., 1999), but qualitative differences can often be seen. For example, Toneatto et al. (1999) found that the most common reported reason for cessation of cocaine use involved a cognitive evaluation of its consequences, not dissimilar to the one evoked by motivational interviewing (Miller &

Rollnick, 1991), and the most common prompt was a conscious decisional process. Other reasons included external pressures or ultimata from significant others, or financial or health problems (Toneatto, et al., 1999). Some were tired of the related lifestyle, expressed a fear of future negative consequences or had noticed negative effects on others. Conversely, those who continued use typically focused on the immediate effects of intoxication (euphoria and escape from problems). A greater understanding of natural recovery in studies such as this has informed advances in treatment design and policy making (Klingemann & Sobell, 2001).

A methodological review of studies reporting natural recovery from alcohol and illicit substances by Sobell et al. (2000) found that the most frequently reported reason for self-change across the studies involved health concerns (17 studies, 43%), followed by negative personal effects (30%; e.g. negative feelings about themselves, embarrassment), and financial concerns (30%). Close behind were changes in the way they viewed their SU (28%), influence from a significant other (25%), or family or social reasons (each 20%). Religious reasons were cited in 7 studies (18%), and work, living arrangements or lifestyle changes were each mentioned in 15% of studies.

Importantly, the review also examined factors that supported maintenance of self-change. The most common were social (support or changes in the social group in 33%, significant other or family factors in 28%), followed by competing behaviors (nonsubstance interests in 20%, and lifestyle change, avoidance of SU situations, work-related changes were each in 18%). Religion, self-control or willpower, and changes in living arrangements were each cited in 15% of studies.

Therefore the first aim of the current review was to identify and explore the current studies on natural recovery from SU in people with psychosis. By summarising and exploring limitations to these studies, it was hoped to identify ways that future research might drive this important area forward. The second aim was to explore whether the reasons for change that underpinned natural recovery from substance misuse in people with psychosis differed from those in the general population. Consideration of these processes was hoped to assist in developing treatments that show more consistent and sustained benefits over controls. Accordingly, this study undertook a systematic review of the current research literature on natural recovery in people with serious mental disorders. A comparison was made with results of studies in the general population.

## 2.3 METHODS

An electronic literature search was conducted in August 2014, using Medline, PsycINFO, Psychology Journals, and Psychology Subject Corner. Search terms for the psychosis group were: (psychosis OR psychoses OR schizophren\* OR schizotypal OR psychotic OR bipolar OR severe mental OR serious mental); (substance OR cannabis OR alcohol OR marijuana OR addiction OR abuse OR cocaine OR dual diagnosis OR comorbid OR comorbidity OR marihuana OR co-occurring); (treatment OR reduction OR cessation OR predict\* OR longitudinal OR natural recovery OR prospective OR cohort OR course OR follow-up). For comparison a general population search was conducted using similar inclusion criteria and variables for analysis; (substance OR cannabis OR alcohol OR marijuana OR addiction OR abuse OR cocaine OR dual diagnosis OR comorbid OR comorbidity OR marihuana OR co-occurring); (reduction OR cessation OR predict\* OR longitudinal OR natural recovery OR prospective OR cohort OR course OR follow-up).

Potential studies were evaluated for inclusion in this study by the first author, based on whether they: (a) reported natural recovery (including other terms reflecting the same phenomenon – self-change, self-quitters, natural resolution, spontaneous recovery); (b) were in English; (c) reported original results; (d) had respondents with a past or current drug problem; (e) did not comprise case studies or personal accounts; (f) could exclude an attribution of recovery to treatment (i.e., no-treatment control groups of randomised controlled trials). Studies of people in treatment for psychosis were included, unless they specifically reported that they were receiving treatment for substance misuse. For the general population search only studies that excluded participants with a SMI were included.

## 2.4 RESULTS

### *Studies on people with psychosis*

The search elicited 2,510 articles. A review of the title of articles indicated 311 included words that were consistent with the search criteria (i.e., they met inclusion criteria (a) and (b) above). This number was reduced to 109 after reading abstracts, in which inclusion criteria (c) to (f) needed to be satisfied. Forward and backward searches on the identified papers yielded another 13 potential articles, whose abstracts were also reviewed for relevance. A final decision on inclusion of a study involved reading of the full paper. Based on reviews no relevant articles appeared to be missed and ambiguous articles were reviewed

additionally by the second and third author and a consensus reached. Seven articles examining reasons or strategies relating to natural recovery for SU in serious mental disorders were identified, and are listed in Table 2.1. Results on reasons for cessation and maintenance of change were examined.

Asher and Gask (2010) qualitatively explored factors that maintained illicit drug use in patients with schizophrenia. During this study they found seven of the participants had ceased use and aimed for this to continue. For these patients reasons reported were disliking the effects and illegality of cannabis, financial, increasing age, health, impact on mental state, family support and occupational/accommodation status. As this was not the main aim of the study, only minimal information pertaining to these reasons was given and the authors did not report the number of participants who endorsed each reason. There was nil confirmation of diagnosis, and it was unclear how long participants had ceased use.

Lobbana and colleagues' (2010) study appears to be the first to qualitatively explore natural recovery from substance misuse in a psychotic population. Young people with a psychotic disorder from an early intervention service in England were assessed. Participants were currently misusing substances (n=10) or used substances (n=9) during the previous 3 to 72 months. The study retrospectively assessed substance misuse patterns, reasons for drug use, factors influencing decision to abstain from SU, and factors influencing continued use of substances through a qualitative interview. Analysis elicited four themes: influence of perceived drug norms on behaviour, attributions for initial and on-going drug taking behaviour, changes in life goals affecting drug use, and beliefs about the links between mental health and drug use. The changes in life goals affecting drug use theme explored the concept of natural recovery (cessation/reduction in use reasons) from SU. Changes in personal life goals, particularly an increase in the perceived value of health, disposable income and close family relationships (largely identified by older participants) appeared to be key reasons for reducing or stopping use. Social aspects played a role in the reduction or cessation of use including identifying with non-using social groups. For a small number of respondents, change occurred after a significant life event.

Limitations of the study included a lack of distinction between the themes reported by participants who were or were not currently using substances. The qualitative focus of the study also prevented an assessment of the frequency of each change strategy. The substance misuse threshold appears to have been low, using on at least 2 days each week, on half of the

weeks in a 3-month period). In addition, the absence of a clear definition of reduction in SU also made results difficult to interpret.

Childs and colleagues (2011) attempted to build on the qualitative methodology of Lobbana et al. (2010), examining the experiences of seven cannabis users over time. The authors observed progressive experiences that led participants to making a decision to cease or continue using. Among those who ceased using cannabis, reasons included consequences of continued use on their mental health, and having protective friends and family members who shielded them against ongoing use and temptation.

Data from a naturalistic 12-month longitudinal study compared motivation to change and the process of change in people with cocaine dependence with schizophrenia and affective disorders (Bennett, et al., 2009). The current review focused on subgroups of participants with schizophrenia and cocaine dependence termed 'S/D', who either identified reduced use in the past 3 months or did not. The group that said they reduced consumption identified a greater number of lifetime consequences, and used more behavioural and experiential processes (such as consciousness raising, contingency management). Process of change was explored in a subgroup of S/D participants who commenced a drug treatment program in the previous three months and those who did not. The two groups did not differ on a range of variables. Exploring the differences between cocaine dependence and cocaine remission in the schizophrenic group yielded a number of differences in terms of drug use and consequence. Bennet et al, (2009) concluded that the ability to remit from cocaine dependence in schizophrenia may be reliant on the participant recognising the serious impact of drug use on their life and functioning, limiting problem use to only one drug, and having only one substance class to address rather than two (cannabis and alcohol). Change was associated with the recognition that substance misuse is causing problems and a number of problems and taking active steps to change. A methodological weakness of the study as it relates to natural recovery was that length of remission was not recorded, which does not allow differences between those participants that had reduced use for 3 months and those who had reduced use for 6 months to be compared. This study was the first of its kind to use a comparison group, however having a control group of non-using participants would have improved the methodology of the study. The study did not explore specific reasons for cessation/reduction in use, therefore the results are limited.

A chart review of young people with schizophrenia or related disorders sort to identify differences between those that ceased or continued CU (Dekker, et al., 2008). No differences in patient characteristics (gender, age of first CU, age of first psychiatric care for psychosis, age at admission to clinic, drug use defined as cannabis only or cannabis and ‘hard’ drugs – ecstasy, cocaine, LSD, amphetamines, opiates, and joints used per week) were found. Of the 206 patients 45 of the records mentioned reasons for cessation of CU. Reasons for cessation included a prior admission (n=23), worsening of psychotic symptoms (n=11), panic/anxiety (n=3), complaints after CU (i.e., nausea) (n=3), New-Year’s resolution (n=2), pressure by others (n=2), and fear of brain damage (n=1). However, the conclusions of this study relating to natural recovery were limited by the lack of a clear definition and variability in the length of abstinence or reduction required and the fact only inpatients with the most severe psychiatric difficulties were included in the chart review.

Stasiewicz, Bradizza, and Maisto, (1997) assessed participants with a SMI and alcohol disorder. Resolution of alcohol disorder was defined as abstinence for at least one year. Reported reason for resolution included hit rock bottom (n=15), major lifestyle change (n=13), weighed pros and cons (n=12), received treatment for mental illness (n=11), and a traumatic event (n=11). With regard to reasons for change, 48% of the sample reported engaging in a cognitive appraisal of the pros and cons of drinking and 68% reported that a negative life event was associated with the initiation of change. A methodological limitation of the study was that the stringent resolution criteria adopted (abstinence for one year) may not have captured clinically important predictors of change in people that have reduced use or people that have ceased use for shorter time periods (e.g. 3 or 6 months). In addition, “lumping” all SMI together may lose important predictors for certain diagnostic categories (i.e., schizophrenia v major depressive disorder). The results of the study are consistent with previous research investigating the resolution of alcohol disorders with people that do not have a SMI, however a control group could have provided a direct comparison. Furthermore as the authors noted, past or current use of other drugs was not assessed, which could confound the results.

A study of participants with schizophrenia who met criteria for substance abuse or dependence were assessed to identify the reasons for SU, their subjective effects, and the reasons for stopping use (Addington & Duchak, 1997). The study did not mention whether participants had ceased using and if so for how long. It appears that the cited reasons for change were hypothetical (i.e., potential reasons for change as opposed to actual reasons).



Possible reasons for cessation of alcohol included, was afraid of what it might do to my health (76%), it costs too much (73%), my doctor disapproves (67%), I did not like they way I was thinking or acting (67%), my parents/relatives disapproved (67%), I had a bad experience with it (67%), I became confused (58%), I was hospitalized (52%). For cannabis it included: it costs too much (86%), my parents/relatives disapproved (86%), I was afraid of what it might do to my health (71%), my doctor disapproves (71%), I became paranoid (71%), I could not keep a job/remain in school/remain in a treatment program (57%).

#### *Comparison of studies in psychosis and in the general population*

The general population comparison group included studies exploring naturalistic recovery of substance users without SMI. Studies that only provided data on substance misuse treatment were excluded. The search was conducted by the first author, and initially elicited 4,853 titles. Reviewing article titles to confirm that they met the search criteria left 57, and this number was reduced to 14 after reviewing abstracts. Two major reviews in the area were examined (Carballo, et al., 2007; Sobell, et al., 2000) to identify any additional papers, but none were added from that procedure. Forward and backward searches on the identified papers yielded another 30 potential articles.

A final decision on inclusion was determined after reading the full paper, and any that raised potential questions on inclusion were reviewed by all authors, with a resolution being by consensus. Thirty-seven articles met full criteria for inclusion as part of the comparison analysis.

A comparison of reasons for use in the studies on samples with serious mental disorders and in the general population (of substance users) is given in Table 2.2. Based on the current research, which is modest in the psychotic populations, the reported reasons for change were generally similar across the two groups. One major difference was that psychotic patients indicated that treatment for mental health difficulties and worsening of mental health difficulties played a significant role in the decision to cease using. Concrete and immediately relevant events (i.e., homelessness, unemployment, financial difficulties, criminal justice, advice/threats from significant others and support services) may be more important for change in people with psychosis.

No large-scale quantitative study that compared the relative incidence or perceived importance of specific reasons in psychotic and control samples was identified. Accordingly,

we were unable to assess whether specific reasons were of greater frequency or influence in people with and without psychosis.

## 2.5 DISCUSSION

It is clear that research on natural recovery from substance misuse in people with psychosis is in its infancy. Although the above studies are not as convincing as randomised control trials or large surveys, the results reflect individuals' change processes and the willingness of people to be forthcoming in reporting their change story (Sobell et al., 2000). Limitations of the study included the fact that only one author conducted the literature search, although decisions on inclusion that were not clear-cut were referred to all authors for collective decision. No papers were identified from the reviews that were not already obtained from the search. Another issue was the exploratory nature of several studies, and the presence of significant methodological limitations, including limited exploration of specific change strategies, inclusion of samples with differing psychiatric diagnoses or substances being used, and a lack of control for symptom severity, or for multiple SU. Differences in methodology also made comparisons between studies difficult—for example, using different definitions of substance misuse and of reduction or cessation of use, reduction versus cessation, differing follow-up durations, and different durations of change to meet the study's criteria for change.

The limited number of studies required that the current review combine data from qualitative and quantitative studies. Similarly, the current review combined studies with differing diagnoses, and studies using longitudinal and cross-sectional designs. Once more studies emerge, systematic reviews should attempt to separate findings that are obtained from these very different methodologies.

Learning from natural recovery from substance misuse in people with psychosis is vital in progressing this area of research forward. As there are only 7 studies in this area to date, caution needs to be taken when drawing conclusions from the results. From these initial results, there appear to be both similarities and differences between the predictors of improvements in substance misuse of the general population and of people with psychosis research.

Few differences between factors supporting natural recovery in psychosis and in the general population were identified, although the reviewed data does not exclude the possibility that the reasons are differentially weighted or have different frequencies in people

with psychosis. For example, the relationship of social acceptance to both reasons for use and for cessation (e.g. in Lobbana et al., 2010) may have special importance in people with psychosis, whose social networks rapidly constrict during early stages of their disorder (Stain et al., 2012). Similarly, social anxiety and coercion (Lobbana et al., 2010) may pose particular challenges for resistance to use in populations where social isolation is common. In the second Australian National Survey of Psychosis, it was concluded that most adults indicated experiencing loneliness (80.1%) and need for more friends (48.1%), which may increase the ongoing use of substances if peers are substance users (Stain, et al., 2012).

Natural recovery studies generally focus on reasons for self-change, and may overlook other characteristics that affect natural recovery, such as being in a relationship or having fewer diagnoses. To the authors' knowledge, there are no current studies specifically addressing this question. There is related research which explores predictors of change in SU in people with psychosis, but the findings are variable and inconsistent (Rebgetz et al., 2014; Rebgetz, Hides, Kavanagh, Dawe, & Young, 2014), and the nature of current/previous treatments for SU are not sufficiently described. Combining these two research approaches may provide insights that neither approach can offer alone.

As having psychotic symptoms stable and having close connections with people seem to be two major slight differences in the psychosis population, it might be that these two areas need to be addressed in treatment before other strategies identified in both populations and found to be significant in the general population research (i.e., decisional balance) can be effective. For example, Maisto et al. (1999) study was excluded from the analysis as it was clear that participants had received some treatment for SU. The study collected qualitative data through focus groups of participants with schizophrenia and a SUD. They rated cessation/reduction using the stage-of-change model, with 17 of the participants being abstinent for at least one month. Reported themes included therapeutic factors helpful in the quitting process, helpful factors that were extratherapeutic, less helpful therapeutic factors, hindrances to change, and abstinence versus reduced use. Therapeutic factors that were helpful included individual, group and self-help/12-step groups. The main theme across the therapeutic factors was emotional and practical support, which was likely learned from therapy. The extratherapeutic factors that were helpful included social support (n=14), changes in one's social environment (n=11), keeping busy (n=8), acute negative experiences/hitting bottom (n=8), weighing the pros and cons (decisional balance) of quitting

versus using (n=9), faith, prayer, or meditation (n=6), goals and additional personal factors (n= 3), and greater effectiveness of medication (n=2).

## 2.6 CONCLUSION

It is clear that treatment of substance misuse in people with psychosis, both in the research and clinical field, is a difficult area with limited effectiveness. Natural recovery in the general substance misuse literature has provided valuable insights into recovery strategies that drive current interventions. Adopting a similar research approach to drive future interventions for people with psychosis and comorbid substance misuse is a logical avenue.

At this point, there appear to be few differences between people with and without psychosis in their reasons for reducing SU, beyond their symptoms and issues related to their social context and functional deficits. However, the current research is very limited and is plagued with methodological limitations. Greater clarity could be obtained by studies with matched clinical and control groups, improved characterisation of participants in terms of symptoms, diagnostic history and degree of SU problems, and a distinguishing of reasons for controlling different substances or substance combinations.

To ensure that future studies are comparing similar constructs, it is important that a clear definition of abstinence or reduction of use is used across studies. Natural recovery from substance misuse alone has generally used abstinence periods of 12 months or longer, whereas studies exploring patterns in substance misuse in psychotic populations have generally used 3 months. It might be useful to study both periods, as reasons for change initially and in maintenance may differ. As research and treatment within people with psychosis remains in infancy, inclusion of qualitative data would seem reasonable. However, some consensus on assessment strategies within quantitative studies is required to ensure comparability.

While additional data with improved methodology will increase confidence in conclusions about reasons for change, the current data did not offer a basis for substantial improvements to current treatments. A more fertile ground for inspiration may be a detailed examination of successful self-management strategies for reduction or cessation of SU that are applied by people with psychosis.

## **2.7 COMMENTARY (SUMMARY AND IMPLICATIONS)**

The literature review pointed to the potential benefit of exploring natural recovery from CU (and more broadly SU) among people with psychosis. The initial step of reviewing the literature in this area was conducted by a systematic search. The search identified only 7 articles that fulfilled criteria. The results suggest that people with psychosis report similar reasons to change as do non-psychotic groups, although specifically the frequency or priority orders are not known to be the same of different. Differences noted included issues relating to psychosis and related functional problems (receipt of treatment for mental health difficulties, worsening of mental health difficulties, and homelessness). The review highlighted that current research on reasons for change in people with psychosis is sparse and has significant limitations. It highlights the need for a detailed investigation of natural recovery from CU (and more broadly SU) among people with psychosis. Additionally the literature review highlighted treatment studies targeting SU in this population have reported mixed results and the need to firstly quantify the amount of recovery from SU within control groups of treatment studies containing samples of psychotic and non-psychotic substance users.

Table 2.1 Articles exploring natural recovery from substance use in psychosis

Author (Date)	N	Participant Characteristics		Natural Recovery Definition	Design	
Childs et al., 2011	7	<i>Setting:</i> Early intervention service.  <i>Country:</i> England	<i>Age Range:</i> 16-30  <i>Median:</i> Not reported.	<i>Inclusion Criteria:</i> Currently experiencing an episode of psychosis or had experienced symptoms of psychosis in the past 12 months, regular user of cannabis currently or in the past	Self-reported regular users of cannabis who subsequently stopped using by themselves.	Qualitative Interview Cross-Sectional  <i>Measures:</i> Interview schedule developed based on existing Interpretative Phenomenological Analysis. Example topics covered experiences of using cannabis and impact and meaning of using cannabis
Lobbana et al., 2010	19	<i>Setting:</i> Early intervention service.  <i>Country:</i> England	<i>Age Range:</i> 18-35  <i>Median:</i> 23	<i>Inclusion Criteria:</i> Diagnosis of a psychotic disorder, currently misusing or recently misusing substances	Self-reported reduction checked against measures of substance use. No history of substance use treatment noted.	Qualitative Interview Cross-Sectional  <i>Measures:</i> Substance Use Checklist, Substance use modules of the SCID Interview schedule exploring decision to abstain from drugs
Asher & Gask, 2010	17	<i>Setting:</i> Psychiatric services  <i>Country:</i> England	<i>Age Range:</i> 16-<40  <i>Median:</i> Not reported.	<i>Inclusion Criteria:</i> Diagnosis of schizophrenia, used substances, and known to local psychiatric services.	Self-reported reasons for substance abstinence. No formal treatment for substance use reported.	Qualitative Interview Cross-Sectional  <i>Measures:</i> Interview of history of drug misuse
Bennett et al., 2009	240	<i>Setting:</i> Outpatient mental health clinics.  <i>Country:</i> USA	<i>Age Range:</i> 18-55  <i>Median:</i> 43.2	<i>Inclusion Criteria:</i> Affective Disorders, Schizophrenia/ Schizoaffective Disorders & DSM-IV diagnosis of current cocaine dependence, early full or sustained full remission	DSM-IV criteria for substance remission as measured during the assessment phases, not reported to relate to therapeutic interventions.	Naturalistic Longitudinal follow-up of 12 months  <i>Measures:</i> SCID, PANSS, The Addiction Severity Index, The Inventory of Drug Use Consequences, The Substance

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Dekker et al., 2008	206	<i>Setting:</i> Inpatient and day-care unit of an Adolescent Clinic.  <i>Country:</i> Holland/ The Netherlands	<i>Age Range:</i> Not reported.  <i>Mean:</i> 21.8 (SD 3)	<i>Inclusion Criteria:</i> Schizophrenia or related disease (Schizoaffective disorder, schizophreniform disorder, psychosis due to cannabis use and psychosis NOS). Cessation of cannabis prior to admittance (up to 15 months)	Self-reported quantitative data of drug use and urinalysis. Cessation of cannabis prior to hospital admission, no reported formal treatment for substance use.	Use Event Survey for Severe Mental Illness, University of Rhode Island Change Assessment-Maryland, The Process of Change Questionnaire, drug version of the Decisional Balance Questionnaire, Temptation to Use Drugs Scale, Abstinence Self-Efficacy Scale.  Chart review. Retrospective cohort.  <i>Measures:</i> Structured clinical interview at time of admission. Data collected on previous and current substance use and self-reported reasons for cessation.
Stasiewicz et al., 1997	25	<i>Setting:</i> Outpatient Mental Health Clinic  <i>Country:</i> USA	<i>Age Range:</i> Not reported.  <i>Mean:</i> 45.7 (SD 7.9)	<i>Inclusion Criteria:</i> Severe Mental Illness with a 2 year minimum psychiatric history and more than one hospitalization and one diagnosed concurrent alcohol disorder. 1 Year resolution period. 32% Diagnosis of Schizophrenia	Self-reported life events and other reasons associated with resolution. No specific substance use treatment reported.	Quantitative Retrospective  <i>Measures:</i> The Brief Michigan Alcoholism Screening Test. DSM-IV criteria, 16-item Drinking Consequences Checklist, 8-item alcohol treatment checklist, Lifetime Drinking History, qualitative questions to assess problem resolution, brief checklist to assess reasons for resolution, checklist to assess maintenance factors

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Addington & Duchak, 1997	41	<i>Setting:</i> <i>Outpatient clinic and community mental health clinic.</i>  <i>Country:</i> <i>Canada</i>	<i>Age Range:</i> <i>19 – 64</i>  <i>Mean:</i> <i>35 (SD 9.3)</i>	<i>Inclusion Criteria:</i> <i>Diagnosis of Schizophrenia/Schizoaffective Disorder who fulfilled the criteria for substance abuse of dependence</i>	Self-reported reasons for cessation. Nil evidence of formal substance use treatment.	Quantitative Cross-Sectional  Measures: SCID, PANNS, Reasons for Use section of a scale for assessing drug and alcohol use in psychotic patients.
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Table 2.2: Comparison of reasons for change/reduction in substance use

Psychotic Group	General Population Group
Health-related (Addington & Duchak, 1997; Asher & Gask, 2010; Bennett, et al., 2009; Dekker, et al., 2008)	Health-related (Copersino et al., 2006; Ellingstad, et al., 2006; Sobell, et al., 2000; Toneatto, et al., 1999)
Finance-related/work related (Addington & Duchak, 1997; Asher & Gask, 2010; Lobbana, et al., 2010)	Finance-related/work related (Ellingstad, et al., 2006; Sobell, et al., 2000; Toneatto, et al., 1999)
Related to significant other/family (Childs, et al., 2011; Dekker, et al., 2008; Lobbana, et al., 2010)	Related to significant other/family (Ellingstad, et al., 2006; Sobell, et al., 2000; Toneatto, et al., 1999)
Negative personal effects (Addington & Duchak, 1997; Asher & Gask, 2010; Bennett, et al., 2009; Lobbana, et al., 2010; Maisto, et al., 1999; Stasiewicz, et al., 1997)	Negative personal effects (Ellingstad, et al., 2006; Sobell, et al., 2000; Toneatto, et al., 1999)
Legal issues (Asher & Gask, 2010; Maisto, et al., 1999)	Legal issues (Ellingstad, et al., 2006; Sobell, et al., 2000)
Changes in living arrangements/social environment (Lobbana, et al., 2010; Maisto, et al., 1999)	Changes in living arrangements/social environment (Boyd et al., 2005; Sobell, et al., 2000)
Viewed substance use/self differently (Bennett, et al., 2009; Maisto, et al., 1999)	Viewed substance use/self differently (Ellingstad, et al., 2006; Sobell, et al., 2000; Toneatto, et al., 1999)
Religious/spiritual reasons (Dekker, et al., 2008)	Religious/spiritual reasons (Ellingstad, et al., 2006; Sobell, et al., 2000)
Social related (Asher & Gask, 2010; Lobbana, et al., 2010; Maisto, et al., 1999)	Social related (Ellingstad, et al., 2006; Sobell, et al., 2000)
Lifestyle change (Asher & Gask, 2010; Lobbana, et al., 2010; Maisto, et al., 1999; Stasiewicz, et al., 1997)	Lifestyle change (Ellingstad, et al., 2006)
Treatment for mental illness/Worse symptoms/Paranoid/Confused (Addington & Duchak, 1997; Asher & Gask, 2010; Childs, et al., 2011; Dekker, et al., 2008; Stasiewicz, et al., 1997)	--
Hospitalisation (Addington & Duchak, 1997; Dekker, et al., 2008)	--
Doctor disapproves (Addington & Duchak, 1997)	--
Medication (Dekker, et al., 2008)	--
New Year's Resolution (Dekker, et al., 2008)	--



# Chapter 3: Paper 2

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## 3.1 NOTES

### *Citation for this paper:*

Rebgetz, S., Kavanagh, D. J. & Hides, L. (2015). Systematic analysis of changes in cannabis use among control conditions of randomised controlled trials. *Addictive Behaviors Reports*, 1, 76-80. doi:10.1016/j.abrep.2015.06.001. Accepted 1 June 2015.

### *Authors' contribution to this paper:*

The candidate is the first author and was responsible for conducting the literature search and review; summarising the results of the review and completing the data analysis; writing the first draft of the manuscript and completing edits based on feedback prior to submission and resubmission. The second and third authors reviewed the summarised results, assisted with data analysis and provided editorial feedback on the manuscript.

### *Overview of this paper:*

The current paper was the first to explore change in control groups of treatment trials of CU interventions. This provided a baseline for assessment of required treatment effects as well as giving additional support for the contention of natural recovery of CU in individuals.



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### Statement of Contribution of Co-Authors for Thesis by Published Paper

The following is the format for the required declaration provided at the start of any thesis chapter which includes a co-authored publication.

The authors listed below have certified\* that:

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2. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
3. there are no other authors of the publication according to these criteria;
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**Rebgetz, S.,** Kavanagh, D.J. & Hides, L. (2015). Systematic analysis of changes in cannabis use among control conditions of randomised controlled trials. *Addictive Behaviors Reports*, 1, 76-80. doi:10.1016/j.abrep.2015.06.001. Accepted 1 June 2015. Published Reference.

Contributor	Statement of contribution*
Shane Rebgetz QUT Verified Signature 16/08/2016	Conducted literature search and review; summarised the results of the review and completed data analysis; wrote the first draft of the manuscript and completed edits based on feedback prior to submission.
David Kavanagh QUT Verified Signature	Reviewed the summarised results, assisted in data analysis and provided editorial feedback on the manuscript.
Leanne Hides QUT Verified Signature	Reviewed the summarised results, assisted in data analysis and provided editorial feedback on the manuscript.

Principal Supervisor Confirmation

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**Original review article****Systematic analysis of changes in cannabis use among participants in control conditions of randomised controlled trials**

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**Number of tables:** 3

**Number of figures:** 1

**Running Title:** Changes in cannabis use in controls

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## **Abstract**

*Introduction:* Cannabis remains the most used illegal substance across the globe, and negative outcomes and disorders are common. A spotlight therefore falls on reductions in CU in people with CUD. Current estimates of unassisted cessation or reduction in CU rely on community surveys, and few studies focus on individuals with disorder. A key interest of services and researchers is to estimate effect size of reductions in consumption among treatment seekers who do not obtain treatment. Effects within waiting list or information-only control conditions of RCTs offer an opportunity to study this question. *Method:* This paper examines the extent of reductions in days of CU in the control groups of RCTs on treatment of CUD. A systematic literature search was performed to identify trials that reported days of CU in the previous 30 (or equivalent). *Results:* Since all but one of the eight identified studies had delayed treatment controls, results could only be summarised across 2-4 months. Average weighted days of use in the previous 30 fell from 24.5 to 19.9, and a meta-analysis using a random effects model showed an average reduction of 0.442 SD. However, every study had at least one significant methodological issue. *Conclusions:* While further high-quality data is needed to confirm the observed effects, these results provide a baseline from which researchers and practitioners can estimate the extent of change required to detect effects of cannabis treatments in services or treatment trials.

*Keywords:* Cannabis; self-management; natural recovery; control conditions.

## 3.2 INTRODUCTION

Cannabis remains the most used illegal drug across the world, and while rates of use are generally falling, the incidence of related harm is rising internationally (United Nations Office on Drugs and Crime, 2014). Australia has particularly high rates of use, with 35% of adults reporting lifetime consumption, and 10% using it in the previous 12 months (Australian Institute of Health and Welfare, 2014).

However, 70-80% of cannabis users stop using it by their mid-thirties (Chen & Kandel, 1998), and even over 5-6 years, substantial rates of cessation or reduced consumption in adolescents or young adults are seen (Kandel & Raveis, 1989; Pollard, Tucker, de-la-Haye, Green, & Kennedy, 2014; Sussman & Dent, 2004). In common with other substances, most successful cessation occurs without treatment (Cunningham, 2000; Price, et al., 2001). While these changes are typically greatest among infrequent or non-problematic users (Chen & Kandel, 1998), people with cannabis abuse or dependence also have substantial rates of recovery. For example, an analysis of data from Wave 1 of the National Epidemiologic Survey on Alcohol and Related Conditions (Agosti & Levin, 2007) found that 81% of people with lifetime cannabis dependence did not meet criteria over the previous year.

While community samples can provide good estimates of the degree and timing of recovery from CUD, sample sizes need to be large to provide accurate estimates of these rates. So, a study of 1228 adolescents (Perkonigg et al., 1999) found only 12 with lifetime cannabis dependence, and the resultant estimate of full remission (32%) therefore had a substantial standard error (26%). Furthermore, treatment trial researchers and services need estimates of remission in treatment seekers.

A study of control groups in treatment studies provides fertile ground for the estimation of changes in treatment seekers who do not receive substantial assistance. These studies have several advantages: high-quality trials typically have diagnostic interviews and other assessments that are able to characterise the samples well, the nature of treatments is standardised or tracked carefully, and substantial effort is put into ensuring that follow-up assessments maximise retention rates. While individual studies often have relatively small sample sizes in their control group, meta-analytic methods provide an opportunity to obtain estimations of effect sizes over multiple studies and substantial samples.

Accordingly, the aim of the current paper was to determine the degree of ‘natural recovery’ in the control groups from RCTs on SUDs, which reported changes in the frequency of CU.

### 3.3 METHODS

Electronic searches were performed in January 2015, to find studies that included a control group that had explored the topic of CU treatment. The search used title, abstract and keywords of Medline, PsycINFO, Psychology Journals, and Psychology Subject Corner. The search terms were: (cannabis OR marijuana OR marihuana OR addiction OR abuse OR substance) AND (treatment OR randomi\* control).

Potential studies were evaluated for inclusion in this study by the first author, based on whether they: (a) provided data on CU, which allowed the calculation of pre-post effect sizes in a group of participants randomised to receive inactive (e.g. waitlist) or minimal interventions (e.g. drug-related information only); (b) were in English; (c) did not comprise case studies or personal accounts; (d) did not include participants with severe mental disorders. In order to report results on a single measure, we restricted the studies to those allowing a calculation of CU in the previous 30 days.

The formal examination of effect sizes used Comprehensive Meta-Analysis (Borenstein, Hedges, Higgins, & Rothstein, 2005), and the primary analysis applied a random effects model. This is the appropriate approach to use when samples or treatments are potentially different, regardless of whether significant heterogeneity is evidenced (Borenstein, Hedges, Higgins, & Rothstein, 2009). We report effects as standardised mean differences (Cohen’s *d*). Analyses of degree of change require estimates of test-retest correlations of the measures, or reported analyses of changes within groups. While Timeline Followback assessments of CU can have a 7-14 day test-retest reliability of 0.92 (Robinson, Sobell, Sobell, & Leo, 2014), we do not know the reliability of the 3-12 month assessments of CU in the current trials. We use an estimate of 0.70 for the primary analyses below, but also undertake sensitivity analyses with test-retest correlations of .60 and .80. Where means and standard deviations were reported on different sample sizes at baseline and follow-up, we used the follow-up sample size for the analysis, estimating baseline scores for retained participants from reported data using the full sample. We also present sample-weighted mean days of use at baseline, post and follow-up assessments.



### 3.4 RESULTS

The search of cannabis treatment in general population samples elicited 2,554 articles. Reviewing article titles to confirm that they met the search criteria left 374, and this number was reduced to 55 after reading abstracts. Further searching was undertaken using reference lists and cited reference search, yielding 12 potential articles. Review papers were examined (Carballo, et al., 2007; Dutra et al., 2008; Sobell, et al., 2000; Tanner-Smith, Wilson, & Lipsey, 2013) to identify any additional papers, but none were added from that procedure. A final decision on inclusion was determined after reading the full paper, and any that raised potential questions on inclusion were reviewed by all authors, until consensus was reached. Studies by Copeland et al. (2001), Lozano et al. (2006), Kadden et al. (2007), Kay-Lambkin et al. (2009), Fernandes et al. (2010), Peters et al. (2011), Stein et al. (2011) and Litt et al. (2013) were excluded due to an inability to calculate a within-group effect size on CU per month from the data provided. The control groups of Stephens et al. (1994), Hendriks et al. (2011) and Budney et al. (2000) provided too much support for them to meet inclusion criteria as a control treatment condition.

The methodological details of the eight included studies are displayed in Table 3.1 and their results are provided in Table 3.2. The studies had a total of 600 control participants. Average weighted mean days of use in the previous 30 days fell from 24.5 to 19.9 at 2-4 months across the eight studies. Only one of the included studies (Fischer, Jones, Shuper, & Rehm, 2012) provided data over a longer follow-up, preventing an assessment of the degree of sustained change across the studies. That study saw little change in use at 12 months ( $M = 22.1$ ,  $SD = 9.2$ ).

Results of the meta-analysis using a test-retest correlation of .70 are displayed in Figure 3.1. The figure displays the average effect using a fixed-effects model. With a random effects model, there was an average change in CU of  $-.442$  SD (CI:  $-.657$  to  $-.228$ ), which was highly significant ( $p < .001$ ). A test of heterogeneity gave  $Q(7) = 57.71$ ,  $p < .001$ , providing support for the selection of the random effects model. Examination of the classic fail-safe  $N$  found that 293 missing studies would be required to give  $p > .05$ . Sensitivity analyses using random-effects effects models and test-retest correlations of .60 ( $-.460$ , CI:  $-.685$  to  $-.235$ ) and .80 ( $-.415$ , CI:  $-.613$  to  $-.217$ ) made little difference to the result.

An evaluation of the methodological quality of the control group data is in Table 3.2. A strength of the studies was their follow-up rates over the control period, with six having

rates of 75% or above and four having rates above 90%. None clearly had single-blind follow-up, but two studies had an independent assessor conducting the follow-up, and three used only self-report. Four studies checked participant reports of CU during follow-up against collateral data or urinalysis. All but two studies verified that most participants had a CUD, although only two used a gold-standard structured clinical interview. A significant potential threat to the interpretation of results as being reflective of unassisted recovery was the lack of reports on other concurrent treatment in four trials, and a high level of reported treatment in one (Gates, Norberg, Copeland, & Digiusto, 2012). Every study had at least one significant issue that should induce caution in the interpretation of its results.

### **3.5 DISCUSSION**

Control groups from the eight RCTs showed a significant mean reduction in days of CU. At 2-4 months' follow up, participants used cannabis on 4.6 fewer days a month than at baseline, reflecting over one additional day of abstinence each week, and giving a total of more than a week of total abstinence each month. The average effect size of  $-.415$  to  $-.442$  SD offers a challenging base from which treatment effects are to be obtained. Our results will assist in minimum sample size calculations for RCTs, and provide a yardstick for the evaluation of changes from services for cannabis misuse.

Interpretation of our results must be moderated by the issues raised in our methodological review of the studies, which identified at least one significant limitation in every study. Perhaps most important was the potential for other treatment to have been responsible for at least some of the observed reductions in CU. The results highlight areas for future improvement of RCTs on CUD that will not only provide increased confidence in the estimates of change in control groups, but also in the reported outcomes of the whole trial.

While there has been research into unassisted cessation of substance misuse for more than 40 years (Carballo, et al., 2007; Sobell, et al., 2000), it is only in the last 15 that this work that has focused specifically on cannabis. To our knowledge, the current review is the first to examine 'natural recovery' in the control groups of RCTs. Regression to the mean may account for some of the observed change, but our results are consistent with population studies (Agosti & Levin, 2007; Perkonigg, et al., 1999), which have similarly observed the potential for recovery from both CU and cannabis dependence, suggesting that at least some individuals can reduce their CU without significant help.

A limitation of this review was the fact that the initial literature search relied on one author, although the resolution of any identified issues and final decisions on inclusion were by consensus of all authors, and no additional papers were identified from reviews. Other limitations included the small number of identified trials with control groups that had no or minimal treatment, and the fact that minimal treatment controls can typically be conducted for periods of only 2-4 months at most. We excluded eight studies because of an absence of data on cannabis consumption over a specific period, in order to preserve comparability of the results across studies: if those studies had provided consumption data, we could potentially have doubled the number of studies in our review. We recommend that future studies routinely include both abstinence rates and average consumption data as part of their results (Peters, et al., 2011). However, despite the restricted number of studies, the total sample size of 600 provided a substantial group for estimation of consumption changes.

### **3.6 CONCLUSIONS**

This is the first meta-analysis to explore changes in CU in control conditions of treatment studies. Results of the current study demonstrate that modest average reductions in the frequency of average CU can be seen, although there was substantial variability in effect size between studies, and some uncertainty over the potential role of outside treatment in the effects. The study gives weight to further exploration of the concept of natural recovery in people with CUDs and provides researchers and practitioners a baseline from which to estimate likely changes or needed effects sizes in intervention studies.

### **3.7 COMMENTARY (SUMMARY AND IMPLICATIONS)**

Our results suggest that individuals with CUD slowly reduce their CU over time. This reduction on average of one day per week is interesting for multiple reasons. From a clinical view it supports the notion of natural recovery and allows clinicians to capitalise on the goal of cessation/reduction in treatment. As individuals with psychosis have added difficulties pertaining to recovery it is necessary to explore if a similar reduction occurs in this group.

As the study excluded those that did not allow a calculation of CU in the previous 30 days, eight were excluded due to this criteria [Studies by Copeland et al. (2001), Lozano et al. (2006), Kadden et al. (2007), Kay-Lambkin et al. (2009), Fernandes et al. (2010), Peters et al. (2011), Stein et al. (2011) and Litt et al. (2013) were excluded due to an inability to calculate a within-group effect size on CU per month from the data provided.] The above authors were contacted to ascertain further data for inclusion in the paper with nil response from the authors.

Table 3.1 Studies on treatment of cannabis use in the past 30 days within control groups of general populations: Studies reporting mean values.

<i>Author (Date)</i>	<i>Sample type</i>	<i>Disorder</i>	<i>Country</i>	<i>Control Group</i>	<i>Measure</i>
Stephens et al. (2000)	COM	98% current CUD	US	Delayed treatment	# days used cannabis per month
Litt et al. (2005)	COM	100% current CUD	US	Delayed treatment	% days used cannabis in the past 90
Walker et al. (2006)	SCH	68% current CUD (86% lifetime CUD)	US	Delayed treatment	# days used cannabis in the past 60
Stephens et al. (2007)	COM	93% current CUD	US	Delayed feedback	# days used cannabis per week
Martin & Copeland (2008)	COM + OP	85% CUD	AU	Delayed treatment	# days used cannabis in the past 90
Fischer et al. (2012)	UNI	CU	CAN	General health information	# days used cannabis in the past 30
Gates et al. (2012)	COM	98% probable CUD on SDS	AU	Delayed treatment	# days used cannabis in the past 28
Rooke et al. (2013)	COM	CU	AU	Cannabis information	# days used cannabis in past month

AU: Australia      CAN: Canada      US: United States of America  
 OP: Outpatients      COM: Community      HM: Homeless/unstably housed      SCH: School      UNI: University  
 CU: Cannabis use      CUD: Cannabis use disorder (DSM-IIR or DSM-IV Cannabis Dependence or Abuse)  
 SDS: Severity of Dependence Scale (Gossop et al., 1992)

Table 3.2. Mean days of cannabis use in the past 30 days, in control groups of treatment trials on people with cannabis use disorders

Study	<i>Baseline</i>			<i>2-4 months</i>		
	N	M	SD	N	M	SD
Stephens et al., 2000	86	24.9	6.1	79	17.1	10.7
Litt et al., 2005 <sup>1</sup>	148	30.0	4.7	148	25.2	10.2
Walker et al., 2006 <sup>2</sup>	50	18.4	8.5	50	16.4	10.3
Stephens et al., 2007 <sup>3</sup>	64	26.0	8.2	64	24.6	8.2
Martin & Copeland, 2008 <sup>4</sup>	20	18.5	10.5	20	18.2	10.5
Fischer et al, 2012	32	23.9	6.1	32	23.1	6.9
Gates et al., 2012 <sup>1</sup>	81	23.9	6.3	61	13.4	12.2
Rooke et al., 2013	119	20.8	8.7	58	14.1	8.8
<b>Total N, Weighted mean</b>	<b>600</b>	<b>24.5</b>		<b>512</b>	<b>19.9</b>	

Conversion formulae from reported means (M) to give days of use in the past 30 days:

- (1) % days used in past 90:  $M \times 30$
- (2) Days used in past 60:  $M/2$
- (3) Days per week:  $(M/7) \times 30$
- (4) Days used in past 90:  $M/3$ ;
- (5) Days used in past 28:  $(M/28) \times 30$ .

Table 3.3 Methodological review of control treatments from the included randomised controlled trials

<i>Study</i>	<i>Symptom/Diagnostic Measure</i>	<i>Treatment received by Controls</i>	<i>Follow-up retention</i>	<i>Intention to treat (and management of missing data)</i>	<i>Single-Blind follow-up</i>
Stephens et al. (2000)	CUD: Self-report CU: Self & collateral report	BL: No current formal treatment 4 mth: 6% had treatment 18% in self-help groups	92% to 4 mths	No	No—Self-report (phone interview if no response)
Litt et al. (2005)	CUD: SCID CU: TLFB, Self & collateral report, urinalysis.	BL: No current Mj therapy, self-help group 4 mth: NR	93% to 4 mths	No (Secondary analyses: BL substitution)	No
Walker et al. (2006)	CUD: GAIN CU: Self-report	NR	98% to 3 mths	No	NR—Self-report; different staff at follow-up
Stephens et al. (2007)	CUD: SCID CU: TLFB, self-report, urinalysis.	BL: No current Mj therapy, self-help group At 7-wks, 6 & 12 mths: 1-4% of whole sample in treatment 2-7% in self-help groups	97% at 7 wks	Yes (BL substitution. Checked with imputation, omission)	No
Martin & Copeland (2008)	CUD: Structured interview (GAIN) & self-report (SDS) CU: TLFB, self-report, urinalysis.	BL: No treatment in previous 90 days 3 mths: NR	80% at 3 mths	Yes (BL substitution)	NR (Independent researcher)
Fischer et al. (2012)	CU: Interviewer-administered questionnaire	NR	52% at 12 mths	No. Analysed completers of all assessments	NR
Gates et al. (2012)	Probable CUD: SDS CU: TLFB, self-report.	BL: No current Mj therapy 3 mths: 46% sought treatment, 39% used medication	75% at 3 mths	Yes (Multiple imputation)	No
Rooke et al. (2013)	CUD: GAIN CU: TLFB, Self-report	BL: No formal Mj treatment in last 3 mths 3 mths: Excluded 4% who had treatment	66% at 6 wks 52% at 3 mths	No (Complier average causal effect analyses. Checked with LOCF, omission)	Automated self-report

CU: Cannabis use

CUD: Cannabis Use Disorder

SCID: Structured Interview for DSM-IV

GAIN: Global Appraisal of Individual Needs (Initial or final) (Dennis, 1998, 1999)

TLFB: Timeline Follow-Back

SDS: Severity of Dependence Scale (Gossop, Griffiths, Powis, & Strang, 1992)

LOCF: Last observation carried forward

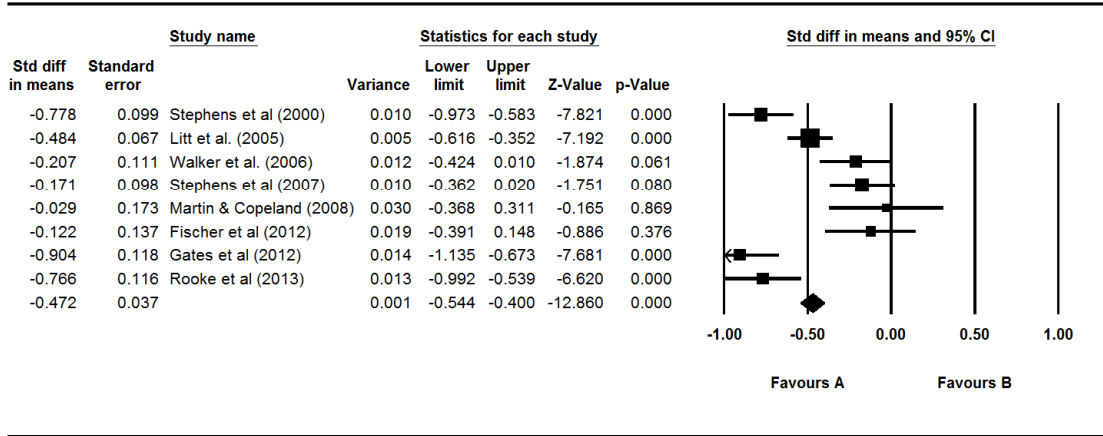
BL: Baseline

Mj: Marijuana

NR: Not Reported

Figure 3.1 Control group changes over 2-4 months in non-psychotic groups.

### Meta Analysis



Meta Analysis



# Chapter 4: Paper 3

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## 4.1 NOTES

### *Citation for this paper:*

Rebgetz, S., Kavanagh, D. J. & Hides, L. (2016). Changes in cannabis use among psychotic clients without specialised substance use treatment. *Schizophrenia Research*. doi: 10.1016/j.schres.2016.03.030. Journal Impact Factor = 3.92. Accepted 24 March 2016.

### *Authors' contribution to this paper:*

The candidate is the first author and was responsible for conducting the literature search and review; summarising the results of the review and completing the data analysis; writing the first draft of the manuscript and completing edits based on feedback prior to submission and resubmission. The second and third authors reviewed the summarised results, assisted with data analysis and provided editorial feedback on the manuscript.

### *Overview of this paper:*

This paper adds to the growing understanding that people without specialised SU treatments make substantial recovery gains. It was the first to explore change in control groups of treatment trials of SU interventions in people with psychosis. This provided a baseline for assessment of required treatment effects as well as giving additional support for the presence of natural recovery of SU in individuals with psychosis.



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### Statement of Contribution of Co-Authors for Thesis by Published Paper

The following is the format for the required declaration provided at the start of any thesis chapter which includes a co-authored publication.

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1. they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
2. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
3. there are no other authors of the publication according to these criteria;
4. potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit, and
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**Rebgetz, S.,** Kavanagh, D.J. & Hides, L. (2016). Changes in cannabis use among psychotic clients without specialised substance use treatment. *Schizophrenia Research*. doi: 10.1016/j.schres.2016.03.030. Journal Impact Factor = 3.92. Accepted 24 March 2016. Published Reference.

Contributor	Statement of contribution*
Shane Rebgetz QUT Verified Signature	Conducted literature search and review; summarised the results of the review and completed data analysis; wrote the first draft of the manuscript and completed edits based on feedback prior to submission.
16/08/2016	
David Kavanagh QUT Verified Signature	Reviewed the summarised results, assisted in data analysis and provided editorial feedback on the manuscript.
Leanne Hides QUT Verified Signature	Reviewed the summarised results, assisted in data analysis and provided editorial feedback on the manuscript.

Principal Supervisor Confirmation

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**Original article**

**Changes in cannabis use among psychotic clients without specialised substance use treatment**

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**Number of tables:** 1

**Number of figures:** 4

**Running Title:** Changes in cannabis use

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## **Abstract**

The need to address SU among people with psychosis has been well established. However, treatment studies targeting SU in this population have reported mixed results. Substance users with psychosis in no or minimal treatment control groups achieve similar reductions in SU compared to those in more active SU treatment, suggesting a role for natural recovery from SU. This meta-analysis aims to quantify the amount of natural recovery from SU within control groups of treatment studies containing samples of psychotic substance users, with a particular focus on changes in CU. A systematic search was conducted to identify SU treatment studies. Meta-analyses were performed to quantify reductions in the frequency of SU in the past 30 days. Significant but modest reductions (mean reduction of 0.3-0.4 SD across the time points) in the frequency of SU were found at 6 to 24 months follow up. The current study is the first to quantify changes in SU in samples enrolled in no treatment or minimal treatment control conditions. These findings highlight the potential role of natural recovery from SU among individuals with psychosis, although they do not rule out effects of regression to the mean. Additionally, the results provide a baseline from which to estimate likely changes or needed effects sizes in intervention studies. Future research is required to identify the processes underpinning these changes, in order to identify strategies that may better support self-management of SU in people with psychosis.

*Keywords:* Cannabis; self-management; psychosis; natural recovery; substance use; Comorbidity

## 4.2 INTRODUCTION

Rates of psychoactive SU in psychotic populations are much higher than those in the general population, and this use has been associated with detrimental psychological, social, and physical effects (Hjorthøj, et al., 2009). These observations have led to concerted efforts to develop effective psychological treatments to reduce this consumption and its associated harm. However, the results of clinical trials on these treatments have been mixed (Hjorthøj, et al., 2014; Hjorthøj, et al., 2009; Kavanagh, Young, et al., 2004; Madigan et al., 2013).

An issue with efforts to address this problem is the extent of change in control conditions. Similar reductions in SU among people with psychosis are often seen after these treatments and in assessment only, minimal treatment or treatment-as-usual control conditions (Kavanagh & Mueser, 2007). A recent review of treatment studies of first episode psychosis groups, including five with and nine without specialised SU treatment, found that participants were able to reduce their average consumption, regardless of whether they received specialist SU treatment or not (Wisdom, et al., 2011). Receipt of specialised SU treatment did not result in larger reductions or better rates of abstinence (Wisdom, et al., 2011). In fact, follow up research on patients with psychosis not treated for SU (Baeza et al., 2009; Caspari, 1999; Lambert, et al., 2005; Wade et al., 2006) have reported abstinence rates of 21%—63% over 15 months to 5 years (Caspari, 1999; Lambert, et al., 2005; Wade, et al., 2006).

These results highlight the potential role of natural recovery from SU in psychotic populations (Wisdom, et al., 2011). While these improvements may reflect effective self-management of SU, they may also reflect regression to the mean (if participants entered treatment during a period of unusually heavy substance use). Observations of reduced consumption in the first month after a negative experience from cannabis, of similar or greater size as in the general population are consistent with both of these suggestions (Green, et al., 2007). Regardless of the phenomenon's determinants, clarifying its extent is important in the interpretation of clinical outcomes and in planning treatment trials.

A gap in current knowledge is that research is yet to quantify the extent of untreated improvements from SU that occurs. Accordingly, the current study conducts a meta-analysis that aims to quantify the reductions in the frequency of SU that is achieved within control groups of treatment studies targeting psychotic clients. It focuses particularly on changes in use of cannabis, the most commonly used illicit substance worldwide (United Nations Office

on Drugs and Crime, 2014), and a substance that has been linked to increased risk of psychotic symptomatic exacerbations and relapse (Hides, et al., 2006).

### 4.3 METHODS

Electronic searches were performed in January 2016 to find studies that included a control group and had tested treatment for current CU in people with both a psychotic and SUD. The searches used title, abstract and keywords of Medline, PsycINFO, Psychology Journals, and Psychology Subject Corner. The search was expanded to include other substances (due to limited results for cannabis alone), giving the search terms: (cannabis OR marijuana OR marihuana OR addiction OR abuse OR substance OR cocaine OR dual diagnosis OR comorbid OR comorbidity OR co-occurring) AND (psychosis OR psychoses OR schizophren\* OR schizotypal OR psychotic OR bipolar) AND (treatment OR randomi\* control).

Potential studies were evaluated for inclusion in this review, based on whether they: (a) provided data that allowed the calculation of pre-post effect sizes in a group of participants receiving inactive (e.g. waitlist) or routine care (excluding SU treatment); (b) were in English; (c) did not comprise case studies or personal accounts. In order to report results on a single measure, we restricted the studies to those reporting days of SU in the past 30 (or equivalent). If this data was not reported, attempts were made to contact the authors to obtain it. Due to limited number of trials, studies that had some participants who used substances (including cannabis) and only reported days of SU (as a global measure) were also included. However, studies that were solely focused on alcohol or nicotine were excluded.

The examination of effect sizes used Comprehensive Meta-Analysis (Borenstein, et al., 2005). A random effects model was applied as it is a more conservative approach and is the appropriate method to use when samples or treatments are different, irrespective of whether significant heterogeneity is demonstrated (Borenstein, et al., 2009). Effects are reported as standardised mean differences (Cohen's *d*). Analyses of degree of change require estimates of test-retest correlations of the measures, or reported analyses of changes within groups. While Timeline Followback assessments of cannabis use can have a 7-14 day test-retest reliability of 0.92 (Robinson, et al., 2014), the reliability of the 3-12 month assessments of CU in the current trials is unknown. As a result an estimate of 0.70 was used for the primary analyses. Sensitivity analyses were also undertaken using test-retest correlations of .60 and .80. Where means and standard deviations were reported on different sample sizes at baseline and

follow-up, the follow-up sample size for the analysis was used, estimating baseline scores for retained participants using the full sample. Sample-weighted mean days of use at baseline, post and follow-up assessments are displayed in Appendix A.

#### 4.4 RESULTS

The search elicited 1,492 articles (See Figure 4.1). Based on reviews in the area, no relevant articles appeared to be missed (e.g., Hjorthøj, et al., 2014; Wisdom, et al., 2011). A final decision on the inclusion of all papers was made after reading the full paper. Any ambiguous articles were reviewed until consensus was reached. Some studies reported substance use in general, but reported the number of cannabis users in the sample and were therefore retained in this study.

Of the 30 papers identified, those by Lehman, Herron, Schwartz, & Myers (1993), Hellerstein, Rosenheck, & Miner (1995), Baker et al. (2006; 2002), James et al. (2004) and Hjorthøj et al (2013) were excluded due to an inability to estimate days of CU in the previous 30. A further 16 studies were excluded due to an inability to calculate a within-group effect size from the data provided (Bellack, Bennett, Gearon, Brown, & Ye Yang, 2006; Bonsack et al., 2011; Burman, 1997; Calsyn, Yonker, Lemming, Morse, & Klinkenberg, 2005; Castle & Ho, 2003; Clark, 2001; Craig, Johnson, McCrone, Afuwape, & Hughes, 2008; Drebing et al., 2005; Haddock, et al., 2003; Hellerstein, Rosenthal, & Miner, 2001; Herman et al., 1997; Kavanagh, Young, et al., 2004; Martino, Carroll, Nich, & Rounsaville, 2006; Ries et al., 2004; Sigmon & Higgins, 2006; Weiss et al., 2007). Essock et al., (2006) was included after consensus by all authors that the standard case management provided to participants was part of routine care and was unlikely to have included extensive SU treatment. The final eight articles meeting full inclusion criteria are described in Table 4.1 and the methodological details in Table 4.2.

Over 6 months, weighted mean days fell from 13.2 to 10.6 across 6 studies (a summary of the mean effects is provided in Appendix A). Using a test-retest correlation of .70, the random effects meta-analysis gave a mean reduction of 0.332 SD ( $p < .001$ ; Figure 4.2), and 80 missing studies would be required to take the result to  $p > .05$ . There was no significant heterogeneity ( $Q(5) = 10.23, p = .069$ ). Sensitivity analyses using test-retest correlations of .60 (-.330, CI: -.460 to -.200) and .80 (-.332, CI: -.461 to -.204) made little difference to the obtained effect.

Figure 4.1 Flow chart of inclusion criteria

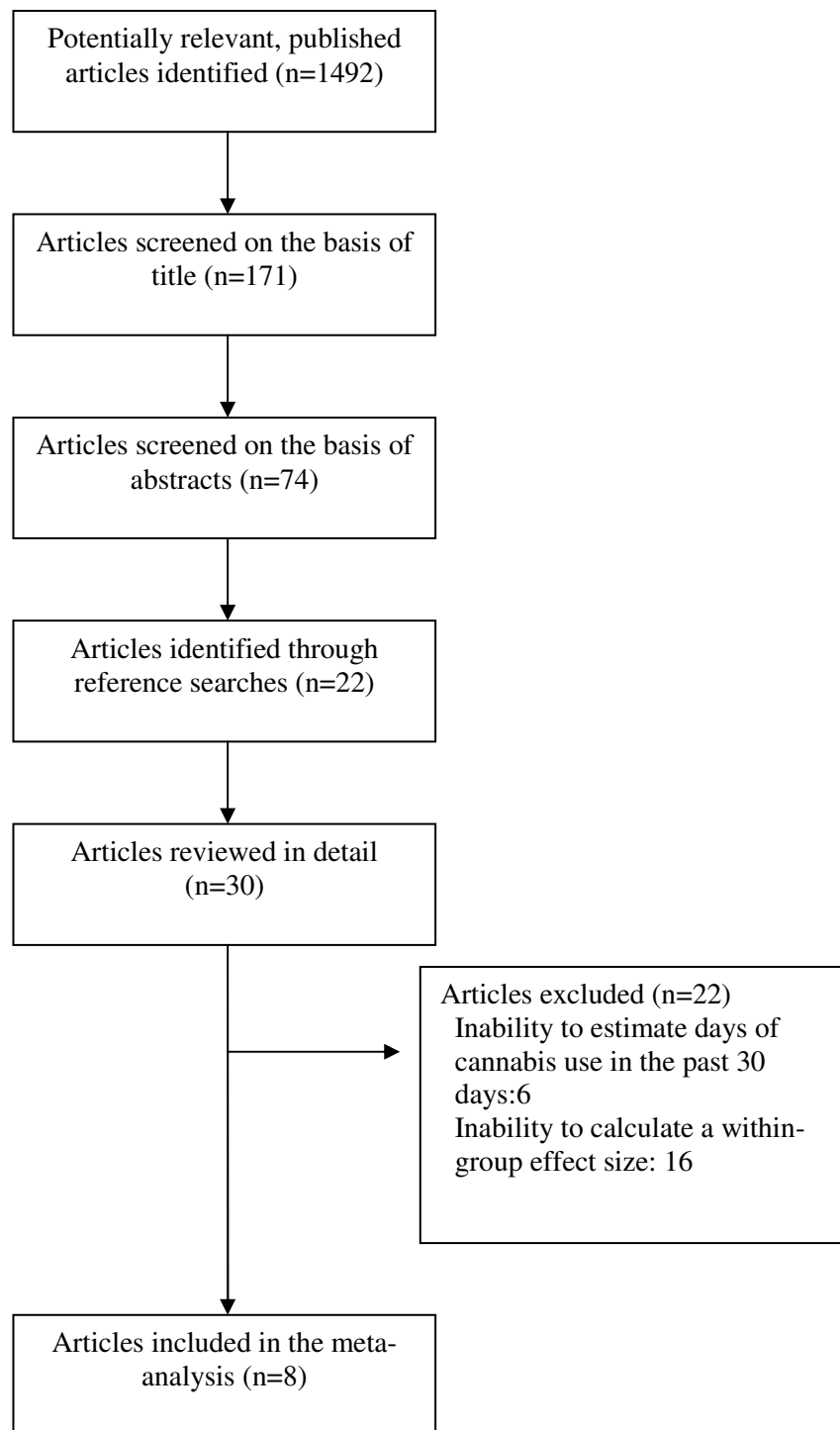




Table 4.1. Methodological characteristics of cannabis and other substance use treatment trials in psychotic populations: Studies reporting the days of cannabis or other substance use in the past 30 days

<i>Author (Date)</i>	<i>Sample Type at Baseline</i>	<i>Disorder</i>	<i>Country</i>	<i>Control Group</i>	<i>Measure</i>	<i>Substance</i>	<i>Retention rates</i>
Drake et al., 1998	OP	SCZ/SA/BP SUD	US	SCM, team approach in community targeting MH & SUD	Days of use in past 6 months	Illicit	91% at 3 years
Edwards et al., 2006	OP	PDNOS CUD	AU	10 week group psychoeducation on psychosis	Percent days used Cannabis in past 4 weeks	Cannabis	71% at 6-months
Essock et al., 2006	OP HM	SCZ/ SA/BP/MD SUD	US	SCM, team approach in community targeting MH & SUD	Number of days of drug use in past 6 months	Illicit	96% at 3 years
Morse et al., 2006	OP HM	SCZ/PDNOS/BP/ MD/SA SUD	US	Shown a list of MH & SU treatment agencies	Days used substances In past 90	Illicit (19% Cannabis)	88% at 2 years
Barrowclough et al., 2010	OP	SCZ/SA SUD	UK	Psychiatric care (medication, case management)	Proportion of days abstinent from main substance in past 90 days	Any (50% Cannabis)	72% at 2 years
Morrens et al., 2011	IP	PDNOS SUD	BE	TAU focused on psychotic symptoms	Frequency of cannabis use over past 30 days	Illicit (60% Cannabis)	71% at 3-months 20% at 1 year
Smeerdijk et al., 2012	OP	SCZ/PDNOS CUD	NL	Routine family support	Mean days of cannabis use in the past 90	Cannabis	86% at 10-months
Madigan et al., 2013	OP	PDNOS SUD	IE	Multidisciplinary care, antipsychotic treatment	Frequency of cannabis use over past 30 days	Cannabis	76% at 3-months 66% at 1 year
AU: Australia	BE: Belgium		IE: Ireland	NL: The Netherlands		US: United States of America	UK: United Kingdom
IP: Inpatients	HM: Homeless/unstably housed		OP: Outpatients				
BP: Bipolar	MD: Major Depression		SCZ: Schizophrenia/schizophreniform			SA: Schizoaffective	
PDNOS: Psychotic Disorder Not Otherwise Specified/psychotic disorder spectrum			CUD: Cannabis Use Disorder (abuse or dependence)			SCM: Standard Case Management	
SUD: Substance Use Disorder (abuse or dependence)							
TAU: Treatment As Usual							

Table 4.2. Methodological review of control treatments from the included randomised controlled trials

<i>Study</i>	<i>Symptom/Diagnostic Measure</i>	<i>Treatment received by Controls</i>	<i>Follow-up retention</i>	<i>Intention to treat (and management of missing data)</i>	<i>Single-Blind follow-up</i>
Drake et al., 1998	SUD: SCID SU: TLFB, ASI, Urinalysis	Standard Case Management	NR	NR	NR
Edwards et al., 2006	SUD: SCID CU: CASUAS, self-report	10 individual PE sessions focused on psychosis, avoiding explicit discussion of cannabis	74% to 6 mths	Yes (LOCF)	Yes
Essock et al., 2006	SUD: SCID SU: TLFB, ASI, urinalysis	Standard Case Management Standard Case Management:	NR	NR	NR
Morse et al., 2006	SUD: SCID CU: self-report	NR Between 0.39 and 0.16 contacts per month in regards to substance abuse treatment	NR	Yes (NR)	No
Barrowclough et al., 2010	SUD: SCID CU: TLFB self-report, hair analysis (25%)	Standard Case Management	91% to 6 mths 71% to 24 mths	Yes (Secondary analyses)	Yes
Morrens et al., 2011	SUD: Clinical interview CU: ASI, self-report	Standard Case Management with no formal for substance use	71% to 6 mths 20% to 12 mths	Yes (Carried previous data forward)	Open label
Smeerdijk et al., 2012	SUD: Clinical interview CU: TLFB	Meetings with a family therapist. No formal skills provided	77% to 10 mths	Yes (means of the multiple imputation method)	Yes
Madigan et al., 2013	SUD: SCID CU: ASI	Standard care. Five participants previous addiction counselling (more than 12 months ago)	76% to 3 mths 65% to 12 mths	Yes (NR)	Yes
SUD: Substance Use Disorder		CU: Cannabis use	SU: Substance use		
SUD: Substance Use Disorder (abuse or dependence)		CUD: Cannabis Use Disorder (abuse or dependence)			
TLFB: Timeline Follow-Back		ASI: Addiction Severity Index	SCID: The Structured Clinical Interview for Diagnosis		
CASUAS: Cannabis and Substance Use Assessment Schedule			NR: Not Reported	LOCF: Last Observation Carried Forward	

Over 10-12 months, the random effects meta-analysis produced a mean reduction of 0.328 SD over 7 studies ( $p < .001$ ; Figure 4.3), and 82 missing studies would be required for the result to reach  $p > .05$ . Heterogeneity fell short of significance ( $Q(6) = 7.91, p = .245$ ). Sensitivity analyses using test-retest correlations of .60 (-.337, CI: -.433 to -.241) and .80 (-.318, CI: -.422 to -.215) again had little impact.

The four studies with data to 24 months had a mean reduction of 0.450 SD ( $p < .001$ ; Figure 4.4), and 81 missing studies would be required to take the result to  $p > .05$ . There was significant heterogeneity in this subgroup ( $Q(3) = 22.99, p < .001$ ). Sensitivity analyses using test-retest correlations of .60 (-.452, CI: -.723 to -.182) and .80 (-.444, CI: -.699 to -.189) did not substantially change the results.

A review of the methodological quality of the control group data is in Table 4.2. Retention rates for 4 of the studies were at least 70% at 6 months, which is an overall strength of the studies. Another strength was that 5 had single-blind follow-up. All of the studies verified SUD and SU across the studies using structured methods with 3 studies verifying SU with urine or hair analysis. A significant weakness of the results being interpreted as natural recovery was the limited information pertaining to SU interventions within standard case management. Every study had at least one significant issue that should induce caution in the interpretation of its results.

Figure 4.2 Control group effects over 6 months

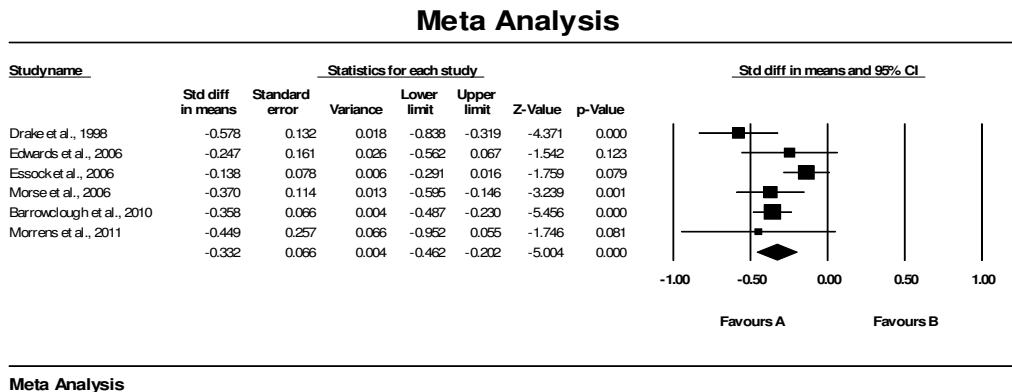


Figure 4.3 Control group effects over 12 months

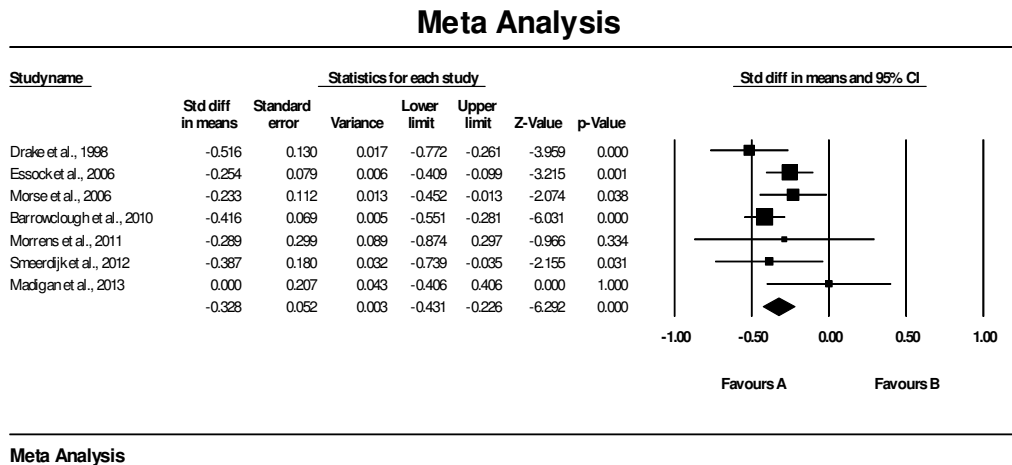
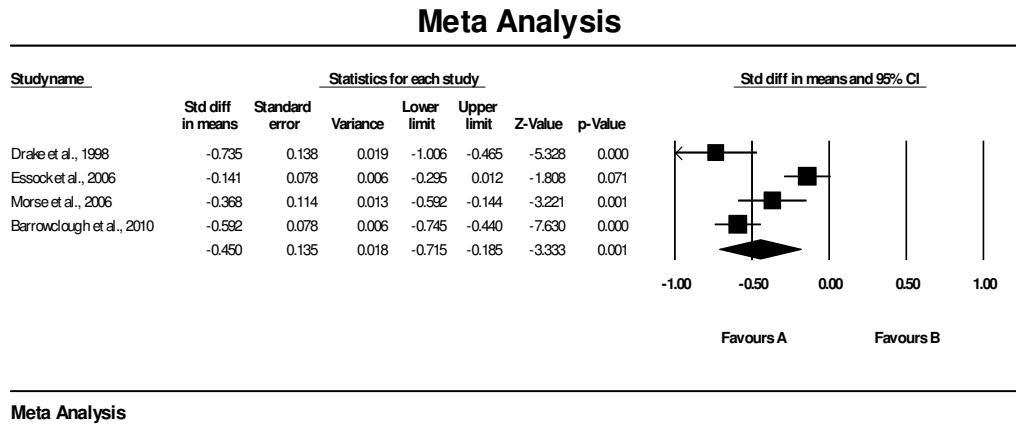


Figure 4.4 Control group effects over 24 months



## 4.5 DISCUSSION

The current review found significant reductions in the frequency of CU among users with psychosis. At 6 months, patients were only using 11 days per month with an average reduction of 0.3 SD. This result provides the degree of change in treatment trials potentially due to natural recovery and the effect required to enhance future specialised SU treatment trials. The results remained modest over time, at 10-12 months an average reduction of 0.3 SD and 24 months 0.4 SD. These results need to be interpreted with caution due to the methodological limitations outlined.

While treatment of CU in people with psychosis has limited differential effectiveness above self-management, results of the current study demonstrate that on average, this population may have potential to self-manage their consumption if they are sufficiently motivated to do so. It is possible that part or all of the observed changes were due to regression to the mean, although the maintenance of the changes over as long as 24 months

suggests concerted self-management rather than statistical aberration. Further research is also needed to determine the extent that the observed improvements across studies have substantial functional or clinical impact.

In our recent review examining reductions in days of CU within control groups of treatment studies we found that average weighted mean days of use in the previous 30 days fell from 24.8 to 18.6 at 2-4 months across nine studies (Rebgetz, Kavanagh, & Hides, 2015b). A meta-analysis could only be undertaken to 2-4 months (due to limited studies providing data on longer follow up periods), which showed an average reduction of .540 SD, which was highly significant ( $p < .001$ ). While the reduction over 6 months in the psychosis samples (0.33 SD) was 40% less than non-psychotic samples obtained over 2-4 months (0.54 SD), the higher level of baseline consumption frequency in the non-psychotic group may have allowed greater regression to the mean. However, due to different time periods a direct comparison between those with and without psychosis cannot be made.

Research into natural recovery from substance misuse in the general population has provided valuable insights into recovery strategies for enhancing treatments. Since at least a partial average recovery appears to also occur in people with psychosis, a similar research approach may also identify new ways to support self-management of SU among this population. A handful of studies have attempted to explore this area, although due to their limited number and methodological limitations, further well-designed research is required (Rebgetz, Kavanagh, & Hides, 2015a).

An important limitation to the current study was the need to exclude 22 papers that did not allow a calculation of effect sizes on the frequency of cannabis or other SU in the previous 30 days. While this criterion ensured comparability across studies, the substantial loss of potential studies highlighted the need for common minimum data reporting in treatment trials across this field. Other methodological limitations include the fact that only one author conducted the main literature search, although any issues on inclusions were referred to all authors for collective decision, and no additional papers were identified from reviews. The presence of differing psychiatric diagnoses or problem substances, and a lack of control for symptom severity or for multiple SU also raise issues. The Essock et al., (2006) paper was included despite some SU treatment being provided to the participants, but the study showed less change than most others and therefore its inclusion did not inflate the size of the obtained effect. Several other studies involved treated samples in which informal SU interventions may have occurred, although specialist treatment for SU was not provided.

Retention rates across the studies appeared to be adequate, although it is possible that participants with more severe SU problems were more likely to drop out, which may have inflated positive outcomes. However if this did occur, it is also likely in future research and clinical applications. Lastly, most studies only included self-reports of SU without urine drug screening. Urine drug screening may have assisted to verify self-reports of CU. However, our previous study, reported high levels of agreement between cannabis immunoassays or gas chromatography/mass spectrometry and self-reported CU (Cohen's kappa = 0.90), which suggests that self-reports are reliable (Hides, et al., 2006; Rebgetz, Hides, et al., 2014). While inflation of the currently observed effects due to reporting biases cannot entirely be ruled out, this research on the reliability of self-reports suggests that any such influence is likely to be minor.

This is the first meta-analysis to explore changes in cannabis/substance use in minimal or no treatment control conditions of clinical trials targeting SU in psychotic patients. Its findings are important: It shows that modest but well-maintained reductions in the frequency of average CU can be seen in patients with psychosis who did not receive specialist SU treatment. A more detailed understanding of strategies that are perceived to assist self-control of SU in these populations could inform the development of new more effective SU treatment.





#### **4.6 COMMENTARY (SUMMARY AND IMPLICATIONS)**

The aim of this study was to quantify the change which could be associated to natural recovery in minimal or no treatment control conditions of clinical trials targeting SU in psychotic patients. Significant but modest reductions (mean reduction of 0.3 to 0.4 SD across the time points) in the frequency of SU were found at 6, 10-12 and 24 months follow up. This highlights that individuals who use substances with psychosis who are not receiving specialised SU treatment engage in self-change. The results allow a baseline from which to estimate likely changes or needed effects sizes in intervention studies. Understanding this change and which factors contribute to the change is important to refine current treatment approaches.

In this original paper we assumed that participants in the control conditions of both the Drake et al. (1998) and Essock et al. (2006) studies received little or no SU treatment aside from usual treatment for their mental illness. However, both of these studies did provide integrated treatment for co-occurring disorders to participants in both groups. The standard case management groups in these studies did receive some targeted treatment for their SU. Perhaps this is one of the reasons both studies found few differences in SU outcomes between the two groups.

None of the studies appeared to report on continuous SU abstinence. As we would expect the prevalence of continuous abstinence to reduce over time, having an increased understanding of this processes is warranted.

# Chapter 5: Paper 4

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## 5.1 NOTES

### *Citation for this paper:*

Rebgetz, S., Conus, P., Hides, L., Kavanagh, D. J., Cotton, S., Schimmelmann, B. G., McGorry, P. D. & Lambert, M. (2014). Predictors of substance use reduction in an epidemiological first-episode psychosis cohort. *Early Intervention in Psychiatry*, 8, 358-365. doi: 10.1111/eip.12067. Journal Impact Factor = 1.95. Accepted 20 May 2013.

### *Authors' contribution to this paper:*

The candidate is the first author and developed the research questions in this paper, conducted the data analysis, drafted the manuscript and finalised the manuscript based on co-authors' editorial feedback. The second and eighth authors wrote the original research protocol for the FEPOS study, conducted the file audit and provided editorial feedback on the manuscript. The third and fourth authors assisted in the development on the research questions in this paper and data analysis and provided editorial feedback on the manuscript. The fifth author assisted in the data analysis and provided editorial feedback on the manuscript. The sixth and seventh authors provided editorial feedback on the manuscript.

### *Overview of this paper:*

The current paper explored quantitatively which baseline factors were associated with a reduction/cessation in SU overtime. A data set from EPPIC was used which explored 432 individuals with FEP and SU over an 18-month period. Using multivariate analysis, two predictors were significant at follow-up; an absence of polysubstance use disorder and a greater premorbid functioning. While there were many limitations to the study, including its reliance on file audits and a lack of data on specific substances or on the timing of substance use and psychosis onset, the study suggested that people with psychosis and poor premorbid functioning may need more than standard treatment for psychotic symptoms to have optimal substance use outcomes.

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The authors listed below have certified\* that:

1. they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
2. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
3. there are no other authors of the publication according to these criteria;
4. potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit, and
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Rebgetz, S., Conus, P., Hides, L., Kavanagh, D.J., Cotton, S., Schlimmelmann, B.G., McGorry, P.D. & Lambert, M. (2014). Predictors of substance use reduction in an epidemiological first-episode psychosis cohort. *Early Intervention in Psychiatry*, 8, 358-365. doi: 10.1111/eip.12067. Journal Impact Factor = 1.95. Accepted 20 May 2013. Published Reference.

Contributor	Statement of contribution*
Shane Rebgetz QUT Verified Signature 16/08/2016	Developed the research questions in this paper, conducted the data analysis, drafted manuscripts and finalised manuscript based on co-authors' editorial feedback.
Philippe Conus QUT Verified Signature	Wrote the original research protocol for the FEPOS study and conducted the file audit. Provided editorial feedback on the manuscript.
Wanne Hides QUT Verified Signature	Assisted in the development on the research questions in this paper and data analysis. Provided editorial feedback on the manuscript.
David Kavanagh QUT Verified Signature	Assisted in the development on the research questions in this paper and data analysis. Provided editorial feedback on the manuscript.
Sue Cotton QUT Verified Signature	Assisted in the data analysis. Provided editorial feedback on the manuscript.



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Benno Schimmelmann	Provided editorial feedback on the manuscript. <b>QUT Verified Signature</b>
Patrick McGarry <b>QUT Verified Signature</b>	Provided editorial feedback on the manuscript.
Martin Lambell <b>QUT Verified Signature</b>	Wrote the original research protocol for the FEPOS study and conducted the file audit. Provided editorial feedback on the manuscript.

Principal Supervisor Confirmation

I have sighted email or other correspondence from all Co-authors confirming their certifying authorship.

Prof David Kavanagh  
Name

  
Signature

16/08/2016  
Date

**Original article**

**Predictors of substance use reduction in an  
epidemiological first-episode psychosis cohort**

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**Running title:** Substance use reduction in FEP

**For publication in:** Early Intervention in Psychiatry

## **Abstract**

**Objective:** To assess the predictors of a significant decrease or cessation of SU in a treated epidemiological cohort of FEP patients.

**Method:** Participants were FEP patients of the Early Psychosis Prevention and Intervention Centre (EPPIC) in Australia. Patients' medical files were reviewed using a standardised file audit. Data on 432 patients with FEP and baseline comorbid SUD were available for analysis. Predictors of reduction/cessation of SU at follow-up were examined using logistic regression analyses.

**Results:** In univariate analyses, a reduction/cessation of SU was predicted by baseline measures reflecting higher education, employment, accommodation with others, CUD only (rather than polysubstance use disorders), better global functioning and better premorbid social and occupational functioning, later age at onset of psychosis, and a diagnosis of non-affective psychosis. In multivariate analysis, CUD alone and better premorbid social and occupational functioning remained significant predictors.

**Conclusions:** Addressing SUDs and social and occupational goals in people with FEP may offer opportunities to prevent SUDs becoming more severe or entrenched. Further longitudinal research on recovery from SU and FEP is needed to disentangle directions of influence and identify key targets for intervention.

*Keywords:* Psychosis, schizophrenia, first-episode, substance use disorder, recovery

## 5.2 INTRODUCTION

High rates of SU among people with psychosis, and the negative biological, psychological, and social consequences of this use are well established (Cleary, Hunt, Matheson, & Walter, 2009; Horsfall, et al., 2009; Kavanagh & Mueser, 2007). Increased rates of treatment noncompliance, relapse, distorted perception and cognition, suicidal ideation, social exclusion, homelessness, aggression, injury, HIV, hepatitis, and cardiovascular, liver, and gastrointestinal disease have been reported as ill effects (Horsfall, et al., 2009; Sheidow, McCart, Zajac, & Davis, 2012). Current treatment approaches to SU in people with psychosis have shown mixed results and unstable long-term outcomes (Cleary, et al., 2008b; Hjorthøj, et al., 2009; Kavanagh, Young, et al., 2004; Lambert, et al., 2005). More puzzling are results indicating substance users with psychosis in assessment only or minimal treatment control conditions achieve similar reductions in SU over time, compared to those in more active SU treatments (Archie, et al., 2007; Edwards, et al., 2006; Gleeson et al., 2009). These findings suggest a role for recovery from SU. A detailed understanding of the processes that support recovery from SU in psychosis may offer important insights into the design of new interventions. However, a recent systematic review conducted by Rebgetz et al (2015a) identified only six studies on this subject.

Some insights are provided by several studies examining predictors of SU in psychosis. Hides et al. (2006) examined the influence of psychotic symptom severity on CU in 84 patients with early psychosis in the 6 months following hospitalisation. Increased psychotic symptom severity and less medication adherence during follow-up were predictive of time to cannabis relapse. A study of FEP patients found those who ceased SU (N=20) between baseline and 15 months follow-up were significantly older, more likely to be in a relationship, to have completed secondary school, and had less severe CU at baseline, than patients with continued SU (N=53; Wade, et al., 2006). However, none of these variables were predictive of SU status in a multivariate analysis. Bartels et al. (1995) reported that patients with chronic schizophrenia and substance dependence (N=148) were less likely to have a remission of SU at a 7-year follow-up than were those who satisfied criteria for abuse. A review by the current authors found that other predictors of recovery from SU included receipt of treatment for mental health problems and improved mental health symptoms (Rebgetz, Kavanagh, et al., 2015a). Reported reasons for reducing or ceasing SU included health, financial, family, social, legal or religious issues, influence from significant others, negative feelings about



themselves as substance users and an awareness that the payoffs of their SU were more than offset by the problems it caused (Rebgetz, Kavanagh, et al., 2015a). Due to inconsistent findings, it was concluded that further research on recovery from SU in psychosis was urgently required, using larger and more representative cohorts of FEP patients.

The First Episode Psychosis Outcome Study (FEPOS) conducted a file audit of a treated epidemiological sample of 786 FEP patients in Melbourne, Australia (Conus, Cotton, Schimmelmann, McGorry, & Lambert, 2007). Results indicated that 61% of FEP patients who had a SUD at admission, had ceased or reduced SU at 18 months follow-up, and 39% continued to use substances. The current paper presents additional analyses on that dataset. This paper focuses on the distinction between CU only and poly SU, as cannabis is the most commonly used illegal drug and other drug use without concurrent CU is uncommon in this population.

This study identifies predictors of a significant reduction/cessation of SU in the FEPOS sample at 18 months' follow-up. Based on previous research, we hypothesised that the presence of a CU disorder at baseline, completion of secondary school, female gender, older age, in a relationship and employed would be among the significant predictors of reduction/cessation of SU at 18 months.

### **5.3 MATERIAL AND METHODS**

#### *Context and sample*

The potential sample comprised a population-based cohort of 786 young people experiencing FEP who were consecutively admitted to the Early Psychosis Prevention and Intervention Centre (EPPIC) service between January 1998 and December 2000 (Conus et al., 2010; Lambert, et al., 2005; Schimmelmann, Conus, Cotton, McGorry, & Lambert, 2007). EPPIC is mandated to engage all publicly treated 16-29 year olds with FEP from the northwestern and western suburbs of Melbourne (Conus, et al., 2010; Lambert, et al., 2005; Schimmelmann, et al., 2007). At the time of the study, the catchment area had a population of approximately 880,000 people, predominantly of lower socioeconomic status, a large proportion of whom were born overseas or had parents who were born overseas (Conus, et al., 2007). The comprehensive EPPIC program focuses on early intervention and is provided for approximately 18 months. It includes extensive psychiatric assessments, outpatient case management, cognitive behavioural therapy, low-dose antipsychotic therapy, access to a

specialised inpatient unit for acute care, mobile crisis intervention and community treatment teams, group programs, family support groups and group treatment of enduring positive psychotic symptoms (Edwards & McGorry, 2002). While some case managers may have addressed SU, the EPPIC program does not include formal SU treatment as a routine component. Data was collected using a retrospective standardised file audit. Baseline variables were rated on information provided at admission and 18 months follow up or discharge from the service (Conus, et al., 2007; Conus, et al., 2010; Lambert, et al., 2005; Schimmelmann, et al., 2007).

Inclusion criteria for the study were a first episode of any DSM-IV psychotic disorder (APA, 2000), except Drug-Induced Psychotic Disorder, Brief Psychotic Disorder, or Psychotic Disorder Due to a General Medical Condition (unless there was a change in diagnosis to another psychotic disorder prior to EPPIC discharge). Participants had to be aged 15–29 years, and have an IQ > 70.

From the original file audit, 84% of available medical records were assessed: the remaining 82 files had been sent to other services and were unavailable for review (these patients did not differ on psychotic, SUD, or demographic variables from the included sample). Five percent of potential participants (n = 43) were excluded due to not meeting diagnostic criteria for inclusion as there was a change in diagnosis to a non-psychotic disorder. The available dataset therefore comprised 661 patients. This paper focuses on 432 patients with SUD at service entry (i.e. 65.4% of the overall dataset). Of the 432, 135 met criteria for substance abuse and 297 for substance dependence.

#### *Diagnostic assessment*

Initial assessment at EPPIC was conducted by two clinicians and reviewed by a senior psychiatrist. It was based on the Royal Park Multi-diagnostic Instrument for Psychosis (RPMIP; McGorry, Copolov, & Singh, 1990; McGorry et al., 1990). Clinical diagnoses (psychoses and SUD) were based on DSM-IV (APA, 2000) and were consensus diagnoses of research psychiatrists (PC and ML), based on medical records across an intensive 6-week assessment period. [Inter rater] Reliability of diagnosis was assessed on a randomly selected subset of 115 patients, which yielded a good reliability for both psychosis (kappa = 0.80) and comorbid substance abuse (kappa = 0.74) diagnoses (Conus, et al., 2007).

### *Assessment of SUD*

SUD was assessed using the Drug and Alcohol Assessment Schedule (DAAS; McGorry, Copolov, et al., 1990; McGorry, Singh, et al., 1990) at baseline, during the treatment period (at 1,2,4 and 6 weeks, and 3,6,12, and 18 months, or discharge if prior to 18 months). In the original dataset, the course of SUD was differentiated into: (1) no SUD (at baseline or during EPPIC treatment); (2) significant reduction or cessation of SUD (decrease in quantity and frequency of  $\geq 50\%$  or cessation of baseline SUD at 18 months or at discharge); or (3) persistent SUD defined as either 3(a) increased SU ( $\geq 50\%$  increase in quantity and frequency of substances used), 3(b) unchanged use ( $< 50\%$  decrease or  $< 50\%$  increase from baseline SUD), 3(c) restarted (SU stopped or decreased, but restarted before discharge, and involved comparable consumption to baseline, or 3(d) newly started ; without baseline SUD) (Lambert, et al., 2005). In the original data set 265 people were in category 1, 167 in category 2 and 229 in category 3. In order to obtain sufficient cases in each category for predictive analyses, these data were recategorised as (a) unchanged, restarted or increased SU and (b) reduced or ceased SU. The polysubstance group consisted of those having a CUD and either an amphetamine, alcohol, opioid, or solvent use disorder.

### *Assessment of baseline, treatment and outcome variables*

Baseline, treatment and outcome (at 18-months follow-up or discharge) variables were retrieved from patient records, using the Early Psychosis File Questionnaire (EPFQ; Conus, et al., 2007; McGorry, Copolov, et al., 1990; McGorry, Singh, et al., 1990), which included a number of standardised scales and questions derived from the RPMIP. Duration of untreated psychosis (DUP) was assessed with the DUP Scale (McGorry, Copolov, et al., 1990; McGorry, Singh, et al., 1990). Global Assessment of Functioning (GAF; APA, 2000) was used to assess premorbid functioning (best GAF in the year preceding illness onset) and baseline functioning. The Scale of Occupational and Functional Assessment (SOFAS; APA, 2000) was used to assess premorbid functioning (best SOFAS in the year preceding illness onset) and baseline functioning. Severity of illness at baseline and discharge was assessed using the Clinical Global Impressions-Severity of Illness (CGI-S; Guy, 1976) and Clinical Global Impressions-Severity of Illness – Bipolar Illness (CGI-BP; Spearing, Post, Leverich, Brandt, & Nolen, 1997) scales. Employment at entry was assessed based on the Modified Vocational Status Index (MVSII; Tohen et al., 2000) and accommodation at entry used the

Modified Location Code Index (MLCI; Tohen, et al., 2000). These scales are well recognised as established ways of measuring these variables.

#### *Procedure*

Patient information was derived from standardised medical records. Using the EPFQ, two psychiatrists assessed the files (ML and PC). Data on the EPFQ was available for baseline (at admission) and at 18 months or earlier discharge from EPPIC.

#### *Data analysis*

Univariate logistic regressions were conducted to identify potential predictors of a reduction or cessation of SU at discharge, among the 432 FEP patients with SUD at service entry. Predictors with uncorrected p-values  $\leq 0.05$  were selected for a multivariate binary logistic regression to identify those offering unique predictions. Analyses were performed using IBM<sup>®</sup> SPSS<sup>®</sup> Version 20.0.

## **5.4 RESULTS**

#### *Patient characteristics*

Demographic information for the 432 patients is shown in Table 5.1. The sample was 73% male and 72% had a diagnosis of a non-affective psychosis (e.g., schizophrenia, schizophreniform disorder, delusional disorder). Over the treatment period, 265 patients (61%) decreased or ceased their SU, while the remaining 167 had no change, restarted or increased SU. The mean follow-up period was 14.5 months (7.7 months); the median was 17.9 months, with a range of 0-48 months.

#### *Candidate predictors of reduction/cessation in SU*

Candidate predictors at baseline included gender, age, employment (employed, student or home duties vs. unemployed); history of physical or sexual abuse (no/yes); accommodation (independent/non-independent); ethnicity (born in Australia/Born Overseas); insight into psychotic illness (none, partial, full); marital status (married or partnered vs. single); diagnosis (non-affective psychosis - schizophrenia, schizophreniform, delusional vs. affective psychosis - schizoaffective, bipolar I disorder, major depression); family history of schizophrenia (no/yes); history of parental separation (no/yes); SUD (CUD, poly SUD (including CU)), CGI-S at entry (normal, not ill, borderline, mild, moderate, marked, severe, extreme), years of completed secondary school; DUP (in days), age of disorder onset (in days), premorbid GAF and SOFAS (each 0-100); age of onset of psychosis; CGI-BP

depression and mania scores. Service time in months was added to control for the length of time at EPPIC.

#### *Univariate predictors of reduction/cessation in SU*

Separate univariate logistic regressions identified eight predictors with a  $p < 0.05$  on the Wald Test: psychotic diagnosis, CUD only at baseline, increased number of completed years of secondary school, older age at onset of illness, better premorbid GAF and SOFAS, employed at baseline and supported accommodation at baseline (see Table 5.2). Female gender, parental separation and shorter DUP were associated with SU outcomes at the  $p < 0.10$  level. Service time (in months) was significant ( $p < 0.05$  on the Wald Test).

#### *Multivariate predictors of reduction/cessation in SU*

Multivariate logistic regression was performed to assess the collective prediction of reduction/cessation in SU, from the eight variables with univariate  $p < 0.05$ . Simultaneous entry allowed a test of whether variables retained significance when predictions from other variables were controlled. This model was statistically significant  $\chi^2(8, N = 371) = 42.79, p < .001$ , explaining between 10.9% (Cox and Snell  $R^2$ ) and 14.9% (Nagelkerke  $R^2$ ) of the variance, and correctly classifying 69% of cases. As shown in Table 5.3, only two independent variables made a unique, statistically significant contribution to the model. An absence of polysubstance use disorder at baseline gave the largest odds ratio (1.574) for a positive outcome, but the most statistically significant contribution was greater premorbid functioning on the SOFAS ( $p = .024$ ), recording an odds ratio of 1.05. The correlation between the two significant predictors was small but statistically significant (Spearman's  $\rho = -.22, p < .001$ ).

Little change in the model was found if the predictors were expanded to those with univariate  $p < 0.10$ :  $\chi^2(11, N = 369) = 46.96, p < .001$ , explaining between 12% (Cox and Snell  $R^2$ ) and 16.4% (Nagelkerke  $R^2$ ) of the variance, and correctly classifying 67% of cases or service time (in months)  $p < 0.10$ :  $\chi^2(9, N = 371) = 52.84, p < .000$ , explaining between 13.9% (Cox and Snell  $R^2$ ) and 19.1% (Nagelkerke  $R^2$ ) of the variance, and correctly classifying 69% of cases. The variables with significant unique prediction remained the same.

## 5.5 DISCUSSION

This is the first study to examine predictors of substance reduction/cessation in a treated epidemiological cohort of FEP patients. Higher levels of premorbid social and occupational functioning and CUD (rather than poly SUD) at baseline emerged as the only predictors of a reduction or cessation of SU at 18-months follow-up.

Premorbid functioning had previously been found to predict better SU outcomes in a chronic (Dixon, et al., 1991), but not FEP sample (Wade et al., 2005). Premorbid social and occupational functioning may potentially have conflicting effects on risk of increased SU. Poor functioning may sometimes increase risk; cognitive and social skill deficits may reflect poor self-control skills, or impair the person's ability to comprehend and apply psychoeducation about SUD. An absence of competing activities such as employment may increase the potential time spent on SU, or unemployment may increase exposure to other heavy substance users. However, in some contexts poor functioning may reduce risk; for example, severely impoverished social activities and networks may reduce exposure to situations where substances are available and consumption is reinforced. Whether acquaintances are substance users and the extent that personal control or substance refusal skills are tested are likely to vary across individuals and social contexts.

It is possible that SU was linked more directly to the presence of acute positive symptoms in patients with higher premorbid SOFAS, and that treatment of these symptoms more effectively contributed to SU reduction or cessation in that group. For example, low premorbid SOFAS may sometimes be driven by factors other than psychosis itself, such as a more deprived and/or less supportive early childhood environment. The treatment of psychotic symptoms in patients where SU is primarily driven by issues other than positive psychotic symptoms is likely to have less influence. Research that drills down into the bases of low SOFAS scores may be important in disambiguating the association with better SU outcomes.

Patients with only a CUD were more likely to reduce or stop using substances at follow-up. This result is open to several interpretations. It is possible that poly SUD is a proxy for more severe substance-related problems. If so, the result is consistent with findings that poly SUD or other severity indicators (e.g., dependence) are linked with continued use (Bartels, et al., 1995; Wade, et al., 2006). Alternatively, poly SUD may increase the risk of continued use of cannabis via a physiological mechanism (e.g. increased impulsivity when

intoxicated by other drugs), through common sources of supply, or via social cues and reinforcers. CU might also be maintained in users of other substances, in order to moderate unwanted effects of those drugs.

Several potential predictors were significant (or approached significance) in univariate analyses, but did not significantly contribute to the prediction of a reduction/cessation of SU in the multivariate analyses. It is perhaps unsurprising that the predictive influence of fewer years of education, higher unemployment and less stable accommodation were captured by the presence of poly SUD or a CUD once it was entered into the analysis, as these variables are often associated with this disorder (Horsfall, et al., 2009; Kavanagh & Mueser, 2007). Similarly, the association of better outcomes from participants with schizophreniform disorder rather than schizophrenia may reflect a greater capacity for change in a group with earlier onset of psychosis. Males were marginally more likely to be substance users at follow-up, but these effects were also fully accounted for by other predictors. In retrospect, this should not have been surprising; gender often drops out of predictions of post-treatment SU in general population samples, once higher SU by males at baseline is accounted for (e.g., Kavanagh & Connolly, 2009).

Consistent with other FEP studies, baseline symptom severity was not predictive of SU status at follow-up (Linszen, Dingemans, & Lenior, 1994; Sevy et al., 2001; Wade, et al., 2005, 2006). This may reflect the instability of symptoms in treated FEP, such that symptom severity at an initial episode may not be a reliable predictor of subsequent symptom severity. This was also a treated FEP sample, which may have (inter alia) focused on SU through psychoeducation. Symptoms may have countervailing effects. For example, when patients are distressed, some may use substances to alleviate this distress. On the other hand, they may also be less likely to mix with others when distressed, which may result in less exposure to SU. Recently Cotton and colleagues (2012) found that participants from the FEPOS sample with depressive symptoms and FEP were less likely to be using substances, suggesting that greater insight may lead to increased understanding of the negative effects of SU on functioning. However in the current study, insight was not related to SU at outcome.

#### *Limitations and strengths*

This is the largest study of predictors of recovery from SUD in FEP conducted to date exploring numerous putative predictors. The use of a treated epidemiological cohort of FEP is a further strength of the study. The study used a retrospective file audit, which relies on the

quality of information obtained and recorded by the researchers and clinicians involved. File audits have been criticised for problems with inter-rater reliability and validity; however, as discussed elsewhere, all efforts were made to reduce the limitations of the file audit (Conus, et al., 2010; Lambert, et al., 2005; Schimmelmann, et al., 2007), including all medical records being assessed by two experienced psychiatrists and inter-rater reliability being established with good reliability.

Other limitations of the data set include the use of a combined variable for a reduction or cessation of SU at 18-months follow-up, and the use of SU in general as an outcome variable, which did not allow for the impact of specific substances to be determined. No data on the specific frequency or quantity of substances consumed at baseline or follow-up was available for analysis. In addition, the presence and nature of any treatment for SUD received was not recorded, and this may have affected the results. Relationships between the timing of SUD and psychosis onsets should be taken into account, but there was no reliable data on this variable. Premorbid SOFAS is limited by the difficulties in defining prodrome onset, and a separation of social and role functioning assessment would have been preferable, since substance users with psychosis often have better premorbid social functioning than non-users (Wade, et al., 2006). Since the present cohort comprised young people during their first 18 months treatment for FEP, the results may also be specific to early phases of the illness. However, the inclusion of participants with SUD gives the results a high level of relevance to many other clinical contexts where FEP patients are seen (Conus, et al., 2007; Conus, et al., 2010; Schimmelmann, et al., 2007).

#### *Clinical implications and future research directions*

This study suggests that prevention or effective treatment of poly SUD may be important in maximising the chance of reduction or cessation of CU in people with EP (Bennett, et al., 2009; Mueser, et al., 2007). Furthermore, people with poor premorbid functioning may need more than standard symptomatic care to achieve better CU outcomes. While the current study is unable to identify what this additional treatment should be, we can speculate that it may need to accommodate the presence of pre-existing cognitive dysfunction, if that was a strong contributor to the premorbid functional deficits. Treatment for those with poor premorbid functioning may also need to have an increased focus on addressing functional deficits and developing social or occupational activities and goals that can then compete with SU, although these foci were already present in the standard interventions offered to this sample.



Further longitudinal research on the predictors of recovery from SU in EP is clearly required, to refine our understanding of key targets for intervention and maximise positive outcomes. In addition, examination of outcomes with different substances is warranted and may lead to different treatments for different substances.

## **5.6 COMMENTARY (SUMMARY AND IMPLICATIONS)**

This study was the largest to date which explored baseline predictors of SU reduction/cessation over 18 months. The two factors of only having a CUD and greater premorbid social and occupational functioning were the only two factors which significantly contributed to SU reduction/cessation. This suggests that incorporating these factors during treatment for SU in a FEP population is required to maximize outcomes. The limitations of data collection via a chart audit and not having data on CU at follow-up are required to be addressed.

Due to the data available we were unable to report how many polysubstance users didn't use cannabis.

Table 5.1 Demographics of the 432 FEP patients with SUDs

	<b>M (SD)</b>
Age, years	21.6 (3.3)
Educational level, completed high school in years	10.4 (1.5)
Premorbid GAF <sup>a</sup> , points	68.4 (10.6)
Premorbid SOFAS <sup>b</sup> , points	68.0 (11.6)
Duration of untreated psychosis, days	253.8 (494.3)
Service time (in months)	<b>14.5 (7.77)</b>
	<b>N (%)</b>
Gender, female	118 (27%)
Parental separation, no	233 (54%)
Employment at baseline, yes	181 (42%)
Accommodation	398 (94%)
Non-affective psychosis	308 (72%)
Cannabis use disorder only (not poly SUD)	180 (45%)
Cannabis use/dependence	307 (71%)

<sup>a</sup> Global Assessment of Functioning (GAF; APA, 2000)

<sup>b</sup> The Scale of Occupational and Functional Assessment (SOFAS; APA, 2000)

Table 5.2 Univariate predictors

Variable	Beta	SE (Beta)	Wald	Significance Level	Odds Ratio	95% CI for Odds Ratio	
<b>Psychotic diagnosis</b>							
Non-affective	-.516	.228	5.118	.024	0.597	0.382	0.933
<b>Poly substance use disorder</b>							
Cannabis use disorder (not poly SUD)	.718	.215	11.176	.001	2.050	1.346	3.124
<b>Gender</b>							
Female	.384	.228	2.836	.092	1.468	0.939	2.295
<b>Education level</b>	.225	.070	10.397	.001	1.252	1.092	1.436
<b>Parental separation</b>							
No	.354	.199	3.156	.076	1.424	0.964	2.104
<b>Age at onset of illness</b>	.066	.029	5.021	.025	1.068	1.008	1.132
<b>Duration of untreated psychosis</b>	.000	.000	2.791	.095	1.000	0.999	1.000
<b>Premorbid GAF<sup>a</sup></b>	.056	.010	29.300	.000	1.057	1.036	1.079
<b>Premorbid SOFAS<sup>b</sup></b>	.060	.101	37.159	.000	1.062	1.042	1.083
<b>Employment at baseline</b>							
Yes	-.585	.205	8.133	.004	0.557	0.373	0.833
<b>Accommodation</b>							
Non-independent living	1.066	.412	6.695	.010	2.903	1.295	6.507
<b>Service time (in months)</b>	.052	.013	14.906	.000	1.053	1.026	1.081

<sup>a</sup> Global Assessment of Functioning (GAF; APA, 2000)

<sup>b</sup> The Scale of Occupational and Functional Assessment (SOFAS; APA, 2000)

Table 5.3 Results of a multivariate logistic regression, with simultaneous entry of univariate predictors with significance of  $p < .05$ .

Variable	Beta	SE (Beta)	Wald	Significance Level	Odds Ratio	95% CI for Odds Ratio
<b>Psychotic diagnosis</b>						
Non-affective	-3.24	.276	1.376	.241	0.723	0.421 1.243
<b>Poly substance use disorder</b>						
Cannabis use disorder (not poly SUD)	.454	.236	3.683	.050	1.574	0.990 2.502
<b>Education level</b>	.020	.087	0.050	.822	1.020	0.859 1.210
<b>Age at onset of illness</b>	.000	.000	0.537	.463	1.000	1.000 1.001
<b>Premorbid GAF<sup>a</sup></b>	-.001	.023	0.002	.965	0.999	0.955 1.046
<b>Premorbid SOFAS<sup>b</sup></b>	.051	.023	5.109	.024	1.053	1.007 1.101
<b>Vocation</b>						
Unemployed	.033	.256	0.017	.897	1.034	0.626 1.707
<b>Accommodation</b>						
Non-Independent Living	.551	.474	1.352	.245	1.735	0.685 4.394

<sup>a</sup> Global Assessment of Functioning (GAF; APA, 2000)

<sup>b</sup> The Scale of Occupational and Functional Assessment (SOFAS; APA, 2000)

# Chapter 6: Paper 5

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## 6.1 NOTES

### *Citation for this paper:*

Rebgetz, S., Hides, L., Kavanagh, D. J., Dawe, S. & Young, R. M. (2014). A prospective study of natural recovery from cannabis use in early psychosis. *European Journal of Psychiatry*, 28, 218-229. doi: 10.4321/S0213-61632014000400003. Journal Impact Factor = 0.46. Accepted 15 October 2014.

### *Authors' contribution to this paper:*

The candidate is the first author and assisted in developing the research questions for this paper, conducted the data analysis, drafted the manuscript and finalised the manuscript based on co-authors' editorial feedback. The other authors developed the original protocol and provided editorial feedback. The second author collected the data and assisted in data analysis. The third author assisted in data analysis.

### *Overview of this paper:*

This study attempts to address two limitations from the previous study by using a prospective dataset to predict abstinence of CU over a 6-month period. Sixty-seven individuals were assessed at baseline and baseline predictors were examined to identify those which influenced CU abstinence. These factors included living in private accommodation and receiving an income. Treatment interventions should consider addressing these issues to benefit individuals' recovery.

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Contributor	Statement of contribution*
Shane Rebgetz QUT Verified Signature 16/08/2016	Developed the research questions in this paper, conducted the data analysis, drafted manuscripts and finalised manuscript based on co-authors' editorial feedback
Leanne Hides QUT Verified Signature	Developed the original protocol and collected the data, assisted in data analysis, provided editorial feedback.
David Kavanagh QUT Verified Signature	Developed the original protocol, assisted in data analysis, provided editorial feedback.
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Signature

16/08/2016  
Date



## Original article

A prospective study of natural recovery from cannabis use in early psychosis

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## **Abstract**

*Background and Objectives:* CU is common in early psychosis and has been linked to adverse outcomes. However, factors that influence and maintain change in CU in this population are poorly understood. An existing prospective dataset was used to predict abstinence from CU over the 6 months following inpatient admission for early psychosis. *Methods:* Participants were 67 inpatients with early psychosis who had used cannabis in the 6 weeks prior to admission. Current diagnoses of psychotic and SU disorders were confirmed using a clinical checklist and structured diagnostic interview. Measures of clinical, SU and social and occupational functioning were administered at baseline and at least fortnightly over the 6-month follow up. *Results:* No SU or clinical variables were associated with 6-months' of cannabis abstinence. Only Caucasian ethnicity, living in private accommodation and receiving an income before the admission were predictive. Only private accommodation and receiving an income were significant predictors of abstinence when these variables were entered into a multivariate analysis. *Conclusions:* While the observed relationships do not necessarily imply causation, they suggest that more optimal SU outcomes could be achieved by addressing the accommodation and employment needs of patients.

*Keywords:* psychosis; substance use; recovery

## 6.2 INTRODUCTION

Both a heightened risk of CU in psychosis and the adverse biological, psychological, and social consequences of CU in psychosis are well established (Cleary, et al., 2009; Horsfall, et al., 2009; Kavanagh & Mueser, 2007). However, clinical trials examining the impact of SU interventions for people with psychosis have given inconsistent and disappointing results (Cleary, et al., 2008b; Hjorthøj, et al., 2009; Kavanagh, Young, et al., 2004). Several studies have found that substance users with psychosis who undergo assessment only or minimal treatment achieve similar reductions in SU over time, to those receiving more intensive SU treatments (Archie, et al., 2007; Edwards, et al., 2006; Gleeson, et al., 2009). A greater understanding of natural recovery from SU in people with psychosis may offer new insights into more effective strategies for addressing it in this population.

Previous research has suggested that continued SU in people with early psychosis is associated a number of variables, such as younger age, male gender, unemployment, non-completion of secondary school, single marital status and greater CU at baseline (Lambert, et al., 2005; Wade, et al., 2006). Unsurprisingly, more severe SU at baseline (e.g. severe substance dependence) also predicts later SU among people with more chronic psychotic disorders (Bartels, et al., 1995). It therefore may be expected that reduction in these risk factors may be associated with a lower rate of SU in early psychosis. To our knowledge no studies have examined which factors predict abstinence of CU in an early psychosis population.

Only a handful of studies have examined predictors of cannabis cessation in people with psychotic disorders (Childs, et al., 2011; Rebgetz, Kavanagh, et al., 2015a). Few findings have been replicated. A recent study conducted by the investigators, found that the presence of a CUD only (i.e. without other concurrent substance misuse) and higher levels of premorbid social and occupational functioning were significant predictors of later cessation or reduction of SU in a treated cohort of first episode patients with psychosis and SUD (Rebgetz, Conus, et al., 2014). However, no distinction between those who ceased and those who reduced their use was made. The identification of factors that lead to continuous abstinence is of particular interest, as any use is likely to be problematic in this group.

Lifestyle factors that enable maintenance of abstinence include the avoidance of situations in which cannabis was previously used, and the development of interests (e.g., diet,

exercise, sport) that are inconsistent with CU (Ellingstad, et al., 2006). Such factors have been implicated in sustained abstinence in people with SMI and alcohol dependence (Stasiewicz, et al., 1997).

In summary, previous research has identified the following predictors of reduction in SU among people with psychosis: older age, female gender, being employed, less severe cannabis and other SU, engagement in social activities, better premorbid adjustment and less severe mental health symptoms. This is the first study to identify demographic, SU, clinical, family and social predictors (assessed at the time of psychiatric admission) of cannabis cessation over the following 6 months in an early psychosis sample.

### **6.3 METHODS**

#### *Sample and Context*

An existing prospective data set collected by Hides et al. (2006) to examine the influence of CU on psychotic relapse over a 6-month follow-up was used for this study. The original sample consisted of 121 consecutively admitted patients with early psychosis recruited from three public hospitals in Brisbane's Inner, Western and Southern Suburbs between March and October 2000. These participants consented to all assessment periods and ethical approval to conduct the study was granted by the Griffith University Human Research Ethics Committee (HREC), and the relevant hospital HREC's. Inclusion criteria included meeting DSM-IV criteria for a current Psychotic Disorder or Mood Disorder with Psychotic Features (APA, 2000) and having less than three previous psychotic episodes. A mixed sample of patients (i.e., psychosis and affective psychosis) was selected, as they represent typical clinical presentations to mental health services in early stages of psychosis, when diagnosis is often unclear. Exclusion criteria included diagnoses of Psychotic Disorder Due to a General Medical Condition or Intellectual Disability. Eighty-one (67%) people agreed to participate in the baseline assessment in hospital and a 6-month follow up, comprising monthly face-to-face visits, interspersed with telephone calls, to provide weekly contact for the first 3 months, followed by fortnightly contact for another 3 months [see Hides et al (2006) for further information]. The present study focused on a subset of 67 participants (83% of the follow-up sample) who had current cannabis dependence (N=57) or had used cannabis in the 6 weeks prior to admission (N=10). Cannabis cessation, the key outcome measure, was defined as abstinence from CU throughout the study period from baseline to a 6-month follow-up.

### *Baseline Measures*

Demographic assessments included age, gender, employment, receiving an income (through employment and government benefits), marital status, parental occupation, current living arrangements, education, ethnicity, diagnosis, age of first diagnosed and admitted, number of episodes and hospital admissions, length of current and previous hospitalisations, current and discharge medication, family history of psychosis and other psychiatric disorders. This information was verified against medical records.

The Operational Criteria Checklist (OPCRIT; McGuffin, Farmer, & Harvey, 1991) was used to confirm psychotic diagnoses, based on the medical record. The Interview for Retrospective Assessment of Schizophrenia (IRAOS; Hafner et al., 1992) verified participants' age at onset of psychotic symptoms. The IRAOS is an objective, reliable and valid assessment tool in studying onset, pre-psychotic prodrome and early course of psychosis (Hafner, et al., 1992). The 24-item Brief Psychiatric Rating Scale (BPRS; Overall & Gorham, 1962) was administered to assess current psychiatric symptoms and has shown high levels of reliability and validity in dual diagnosis populations (Lykke, Hesse, Austin, & Oestrich, 2008).

The Composite International Diagnostic Interview Version 2.1 (CIDI; World Health Organization, 1997) Section L identified whether substance abuse or dependence was present in the 12 months prior to admission. A Timeline Followback (TLFB; Sobell & Sobell, 1992) measured the frequency (days) and quantity of cannabis and other SU in the 6 weeks prior to admission by anchoring SU against key life events to assist recall (Fals-Stewart, O'Farrell, Freitas, McFarlin, & Rutigliano, 2000; Sobell & Sobell, 1992). TLFBs have well-established reliability and validity (Fals-Stewart, et al., 2000; Sobell & Sobell, 1992). Cannabis effect expectancies were identified using the 23-item Cannabis Expectancy Questionnaire (CEQ; Young & Kavanagh, 1997). Positive and negative expectancies on the CEQ have demonstrated concurrent validity with CU and dependence in a treatment sample of cannabis users. In a treatment sample of cannabis users, higher positive cannabis expectancy scores were associated with greater CU, while higher negative expectancy scores predicted greater cannabis dependence (Connor, Gullo, Feeney, & Young, 2011).

Key life events were defined according to the Psychiatric Epidemiological Interview–Life Events Scale (PERI–LES; Dohrenwend, Krasnoff, Askenasy, & Dohrenwend, 1978) measured on the TLFB. The Family Environment Scale (FES; Moos & Moos, 1994) was

used to measure family relationships (conflict, expressiveness, cohesion) in current family functioning for those participants' in regular contact with their families. The FES has demonstrated discriminative and predictive validity in psychotic populations (Phillips, West, Shen, & Zheng, 1998). The Quality of Life (QOL-Brief Version; Lehman, 1995) scale measured objective quality of life and global wellbeing in the previous 12 months. The scale has shown good levels of inter-rater reliability and validity in people with schizophrenia (Gupta, Mattoo, Basu, & Lobana, 2000). The Premorbid Adjustment Scale (PAS; Cannon-Spoor, Potkin, & Wyatt, 1982) assessed premorbid functioning in the 6 months preceding first admission. It has demonstrated good levels of inter-rater reliability and validity amongst people with schizophrenia (Cannon-Spoor, et al., 1982).

### *Monitoring Measures*

Psychiatric symptoms were monitored using the BPRS (Overall & Gorham, 1962) throughout the 6-month follow-up. Only BPRS items that did not require interviewer observation could be included in telephone interviews. BPRS positive, negative and depression-anxiety symptom scores were derived (Ventura, Nuechterlein, Subotnik, Gutkind, & Gilbert, 2000). TLFBs measured the frequency (days) and quantity of cannabis and other SU, life events, life stress (subjectively rated from 0 to 10) and medication adherence (in days) at least fortnightly over the 6-month follow-up.

Participants underwent urine drug screening at 6 months or while in hospital, to verify self-reports of recent SU and antipsychotic medication adherence. Urine was screened using a cannabis immunoassay and gas chromatography/mass spectrometry. There was a high level of agreement between these assays and self-reported CU (Cohen's kappa = 0.90).

### *Statistical analysis*

Candidate predictors of cannabis cessation identified in the literature to date (listed in Table 6.2) were initially entered into a series of univariate logistic regressions to identify predictors of cannabis cessation. Other plausible predictors that were also examined included living arrangements (living in private accommodation), ethnicity (being Caucasian), financial status (having an income), total cannabis expectancy score, age of onset of CU, family relationships (conflict, expressiveness, cohesion) and family history of psychosis or other mental illness. Significant predictors ( $p < .05$ ) were entered simultaneously into a multivariate logistic regression, to identify which variables retained significance ( $p < .05$ )

when other predictors were controlled for. Analyses were performed using IBM® SPSS® Version 22.0.

## 6.4 RESULTS

### *Participant characteristics*

The sample had a mean age of 24.5 (SD 5.2) years, and the majority were male (N=52/67; 78%), with a diagnosis of schizophrenia or schizophreniform disorder (N=48/67; 72%). The demographic, SU and clinical characteristics of the patients who did and not cease CU from baseline to the 6-month follow up assessment are displayed in Table 6.1. While data were not available on whether they received brief advice concerning their SU, none received extensive inpatient or outpatient specialist treatment for addiction, and 66% (N = 44) did not see a psychiatrist or case manager during the follow-up period.

Despite the absence of specific SU treatment, 19 participants (28%) did not use cannabis at all over the 6-month follow-up. In fact, 27% (18/67) refrained from any illicit SU during the follow up period. Almost 80% (N=53/67; 79%) abstained from methamphetamine use over the 6-months, but only 10/67 (15%) abstained from alcohol.

### *Univariate predictors of cessation in CU*

Separate univariate logistic regressions identified three predictors of cannabis cessation (See Table 6.2). Only living in private accommodation, receiving an income at baseline and Caucasian ethnicity predicted cessation with  $p < .05$  on the Wald Test. Notably, neither baseline symptoms (on the BPRS) nor any baseline SU measure (including baseline measures of quantity/frequency of cannabis, other illicit drug or alcohol use, the severity of cannabis dependence or cannabis expectancies on the CEQ) predicted subsequent cannabis cessation.

### *Multivariate predictors of cessation in CU*

A multivariate logistic regression was performed to identify which of these univariate predictors retained significance when entered simultaneously into the analysis (see Table 6.3). The full model significantly distinguished between participants who had ceased and continued CU post-admission ( $\chi^2(3, N = 67) = 21.26, p < .001$ ). The model explained 27% (Cox and Snell R square) to 39% (Nagelkerke R squared) of the variance, and correctly classified 81% of cases. As shown in Table 6.3, only private accommodation and receiving an income made a significant unique contribution. The strongest predictor of cannabis

cessation was private accommodation, recording an odds ratio of 11.87, while receiving an income increased the odds by 9.51.

Little change in the model was found if participants with only cannabis dependence (N=57; i.e. excluding abuse) were included,  $\chi^2(3, N = 57) = 17.83, p < .001$ . The equation explained between 27% (Cox and Snell  $R^2$ ) and 38% (Nagelkerke  $R^2$ ) of the variance, and correctly classified 79% of cases. The same unique predictors emerged.

## 6.5 DISCUSSION

This was the first prospective naturalistic study to examine predictors of cannabis cessation, in an early psychosis sample. Almost 30% of cannabis using early psychosis patients ceased CU for at least 6 months following an inpatient admission for acute psychosis. A similar proportion refrained from any illicit SU at all during the follow up. These results are consistent with a growing body of work indicating that recovery from SU can occur in early psychosis in the absence of significant SU treatment (Addington & Addington, 2001; Carr, et al., 2009; Cleary, et al., 2008b; Harrison, et al., 2008; Hinton, et al., 2007).

In order to increase current understanding of natural recovery from CU in early psychosis, the current study examined the impact of a wide range of potential demographic, clinical, SU, social, treatment, functional and quality of life variables on cannabis cessation. Having private accommodation and an income at admission provided the only significant unique predictions of cannabis cessation in the multivariate analysis. Early psychosis patients living in private accommodation and those with an income were 11 and 9 times more likely to abstain from CU respectively. These findings were consistent with those of Maisto et al. (1999), who found that living in stable accommodation (group homes), which often restricted access to substances and provided structure, was a factor associated with changing SU patterns. Individuals who have stronger predictability in their lives may reduce their SU, due to the associated increases in positive social interactions outside of SU and decreased stress (Maisto, et al., 1999). Similarly, having an income may allow people to engage in other activities outside of CU (e.g., sport, hobbies), providing a sense of belonging and acceptance (Lobbana, et al., 2010). These activities may engage people in a positive social network, away from substance-using peers and provide an opportunity for a reappraisal of the value of more functional rewards and of the financial and opportunity costs associated with CU (Addington & Duchak, 1997; Ellingstad, et al., 2006; Lobbana, et al., 2010).



The protective effects of both private accommodation and an income are open to other interpretations. For example, they may reflect higher levels of cognitive and social functioning, which may then allow greater control over CU. While cognitive functioning was not assessed, it is notable that the presence of social activities and premorbid adjustment were not significant univariate predictors. These characteristics might also be expected among individuals with less severe levels of CU and cannabis-related problems (e.g. less interference with an ability to obtain financial support, a greater proportion of income being available for accommodation). However, the fact that neither the extent of cannabis and other SU nor the presence of cannabis dependence at baseline predicted later cannabis cessation renders this hypothesis unlikely.

The finding that neither baseline cannabis nor other SU was associated with cannabis cessation was both noteworthy and surprising. It differs from the observation of Wade et al (2006) that continued SU at 15 months was associated with heavy CU prior to baseline, but was consistent with a chart audit by Dekker et al (2008) that found no association.

The presence of polysubstance use is often used as an indicator of severity. While almost 50% of the sample were polysubstance users (defined as cannabis plus other substances) in the 6 weeks prior to admission, there was no significant difference in the proportion of polysubstance users and cannabis users who achieved abstinence from CU or any SU over the 6-month follow-up. This does not accord with our recent finding that first-episode patients with a CUD at baseline were more likely to have reduced or ceased SU at 18-months follow-up than were those with polysubstance use disorders (Rebgetz, Conus, et al., 2014). However, that study relied on file audits and included reductions in consumption, whereas the current study focused on complete abstinence, and systematically measured SU at least fortnightly over 6 months follow-up.

Unlike previous studies conducted by our group (Hides, Kavanagh, Dawe, & Young, 2009) there was no association between positive and negative cannabis expectancies and cannabis cessation. Notably, however, the current study is the first to examine the association between cannabis expectancies and abstinence.

Contrary to our hypotheses, neither male gender, younger age, incomplete secondary school, nor unemployment (Cuffel & Chase, 1994; Wade, et al., 2005) were significant predictors of cannabis cessation. These factors are typically associated with the risk of SU and related functional impacts rather than with cessation of use among substance users.

Equally, the severity of BPRS psychiatric symptoms at baseline was not associated with cannabis cessation.

This study had a relatively small sample size, and while it was adequate—particularly for the univariate predictions (Tabachnick & Fidell, 2012)—greater confidence in our conclusions would be given by a replication using a larger sample. Abstinence from CU was assessed over 6 months, whereas some other studies have used a 12-month criterion for abstinence (Drake, et al., 2004). On the other hand, the current study had weekly assessments of CU for the first 3 months, followed by fortnightly assessments for 3 months—a level of monitoring that was much more intensive than is typically obtained. The high degree of concordance between self-reported SU and urine drug screens in the hospital and at 6 months gave further credence to the results.

Finally, while it is plausible that treatment in the post discharge period may influence abstinence, it is notable that this was a relatively uncommon occurrence. Only a third of participants received specialist psychiatric care during the follow-up, and none received SU treatment. While some participants may have received brief, opportunistic intervention, the study provides a close approximation of a naturalistic follow-up.

#### *Clinical Implications and Future Research Directions*

This was the first prospective study to examine the role of a range of demographic, clinical, SU, family/social, quality of life and functional variables on cannabis cessation in an early psychosis sample that did not receive substantial SU treatment. Only private accommodation and access to a regular income predicted cannabis cessation for 6-months following an inpatient admission.

While the current results could be due to an unmeasured factor such as the level of cognitive functioning, the prospective design and the wide range of assessed predictors gave credence to the results. Addressing basic needs is likely to be a vital step in recovery. Our results suggest that optimal SU outcomes from early psychosis services may be achieved by address the accommodation and employment needs of patients as well as their mental health symptoms. Given the size of the effect found addressing the lack of suitable accommodation via policy and community advocacy is a key priority. Such an approach is consistent with comprehensive case management, and with a strengths-based approach to the challenges of early psychosis.

## **6.6 COMMENTARY (SUMMARY AND IMPLICATIONS)**

This study addressed the limitations of our previous study by prospectively following individuals over a 6-month period and measuring CU closely along the way. The findings of private accommodation and access to a regular income predicting cannabis cessation at 6-

months was inconsistent with our previous findings. A number of methodological issues may account for such differences, however these differences are reported across numerous studies. A potential avenue to address these concerns is to explore qualitative accounts for reduction/cessation. Additionally, this would allow for specific exploration of factors leading to cessation/reduction as well as maintenance factors and relapse contexts.

Table 6.1 Demographic, substance use and clinical characteristics of the patients who ceased (N=19) and did not cease (N=48) cannabis use for 6 months

	<b>Cannabis cessation</b>			<b>Cannabis cessation</b>	
	<b>Yes</b>	<b>No</b>		<b>Yes</b>	<b>No</b>
<i>Demographics</i>			<b>Diagnosis, N (%)</b>		
Age, M (SD)	24 (4.9)	24.7 (5.3)	Schizophrenia/Schizophreniform	14 (74%)	34 (71%)
Gender, male, N (%)	15 (79%)	37 (77%)	Affective with psychotic features	4 (21%)	10 (21%)
Employed, N (%)	5 (26%)	15 (31%)	Substance-Induced	1 (5%)	4 (8%)
Private accommodation, N (%)	9 (47%)	41 (85%)	<i>Symptoms on BPRS</i>		
			Total, M (SD)	44.7 (9.1)	46.0 (7.9)
Ethnicity, Caucasian, N (%)	15 (79%)	46 (95%)	Negative, M (SD)	4.4 (1.2)	4.6 (1.1)
Completed high school, N (%)	7 (37%)	9 (19%)	Positive, M (SD)	15.2 (3.9)	15.4 (3.8)
Receiving an income, N (%)	5 (26%)	28 (58%)	Depression-anxiety, M (SD)	7.4 (2.3)	7.9 (3.2)
Relationship, single, N (%)	18 (95)	41 (85%)	Manic-excitement, M (SD)	16.3 (4.0)	11.8 (3.9)
<i>Life events</i> (LES Total), M (SD)	5.9 (2.1)	6.5 (1.9)	<i>Substance Use</i>		
<i>Social activity</i> , N (%)	11 (58%)	29 (60%)	Age of onset of cannabis use, M (SD)	15 (2.7)	14.9 (3.4)
<i>Clinical</i>			Cannabis abuse, N (%)	2 (10%)	8 (17%)
Premorbid adjustment (PAS Total), M (SD)	26.6 (10.9)	29.4 (12.4)	Cannabis dependence, N (%)	17 (90%)	40 (83%)
Duration of untreated psychosis (days), M (SD)	152.9 (158.6)	165.8 (302.5)	Days used cannabis, M (SD)	19.2 (15.4)	21.4 (16.2)
Age first diagnosed with psychosis, M (SD)	22.9 (5.0)	23.3 (5.0)	Cones per cannabis use day, M (SD)	8.3 (12.4)	4.6 (4.2)
First hospital admission, N (%)	5 (26%)	18 (38%)	Polysubstance use, N (%)	14 (74%)	44 (91%)
Family history of psychosis, N (%)	8 (42%)	11 (24%)	Amphetamine dependence, N (%)	7 (37%)	17 (35%)
Family history of other mental illness, N (%)	5 (26%)	23 (48%)	AUDIT total, M (SD)	10.4 (8.4)	9.8 (9.6)
<i>Family environment</i> (FES), M (SD)	19.5 (3.0)	18.1 (3.9)	SDS total, M (SD)	4.7 (3.0)	5.3 (4.1)

Note. Polysubstance use: cannabis plus other substance use. Substance use refers to use in 6 weeks prior to admission

Table 6.2 Results of univariate logistic regressions predicting cannabis cessation over the following 6 months

Variable	Beta	SE (Beta)	Wald	Significance Level	Odds Ratio	95% CI for Odds Ratio	
<i>Demographics</i>							
Age	-0.028	0.055	0.259	0.611	0.973	0.874	1.082
Male gender	0.109	0.659	0.027	0.869	1.115	0.306	4.059
Employed	0.241	0.607	0.158	0.691	1.273	0.387	4.182
Receiving an income	<b>1.366</b>	<b>0.598</b>	<b>5.225</b>	<b>0.022</b>	<b>3.920</b>	<b>1.215</b>	<b>12.647</b>
Private accommodation	<b>1.873</b>	<b>0.615</b>	<b>9.272</b>	<b>0.002</b>	<b>6.508</b>	<b>1.949</b>	<b>21.728</b>
Caucasian	<b>1.814</b>	<b>0.916</b>	<b>3.924</b>	<b>0.048</b>	<b>0.163</b>	<b>0.027</b>	<b>0.981</b>
Completed high school	-.927	.602	2.369	.124	.396	.121	1.288
Relationship	1.123	1.106	1.031	.310	3.073	.352	26.844
<i>Substance Use</i>							
Age onset of cannabis use	0.014	0.083	0.028	0.867	1.014	0.861	1.194
Cannabis dependence	-0.531	0.842	0.397	0.529	0.588	0.113	3.063
Poly-SU, cannabis use only	-0.296	0.554	0.286	0.593	0.743	0.251	2.203
CEQ total	-0.005	0.009	0.280	0.597	0.995	0.977	1.013
<i>Social</i>							

<b>Social activities</b>	0.780	0.572	1.861	0.172	2.182	0.711	6.692
<i>Clinical</i>							
<b>Premorbid Adjustment (PAS total)</b>	-0.020	0.023	0.727	0.394	0.981	0.937	1.026
<b>Duration of untreated psychosis</b>	-0.066	0.004	2.638	0.104	0.994	0.987	1.001
<b>Family history of psychosis</b>	-0.839	0.579	2.099	0.147	0.432	0.139	1.345
<b>Family history of other mental illness</b>	1.030	0.599	2.958	0.085	2.800	0.866	9.052
<b>BPRS total</b>	-0.021	0.035	0.352	0.553	0.979	0.914	1.049
<b>BPRS negative</b>	-0.127	0.274	0.217	0.624	0.880	0.515	1.505
<b>BPRS positive</b>	-0.018	0.072	0.064	0.800	0.982	0.852	1.131
<b>BPRS depression-anxiety</b>	-0.064	0.097	0.426	0.514	0.938	0.775	1.136
<b>BPRS manic-excitement</b>	-0.004	0.058	0.004	0.949	0.996	0.889	1.117

Note. Bold indicates variables significant at <0.05. Substance use refers to the 6 weeks prior to admission





Table 6.3 Multivariate logistic regression predicting a cessation in cannabis use

Variable	Beta	SE (Beta)	Wald	Significance Level	Odds Ratio	95% CI for Odds Ratio	
<b>Private accommodation</b>	<b>2.474</b>	<b>0.854</b>	<b>8.403</b>	<b>0.004</b>	<b>11.874</b>	<b>2.228</b>	<b>63.271</b>
Caucasian	1.408	1.138	1.531	0.216	0.245	0.026	2.276
<b>Receiving an income</b>	<b>2.253</b>	<b>0.845</b>	<b>7.108</b>	<b>0.008</b>	<b>9.513</b>	<b>1.816</b>	<b>49.833</b>

Note. Bold indicates variables significant at <0.05

# Chapter 7: Paper 6

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## 7.1 NOTES

### *Citation for this paper:*

Rebgetz, S., Hides, L., Kavanagh, D. J. & Choudhary, A. (2015). Natural recovery from cannabis use in people with psychosis: A qualitative study. *Journal of Dual Diagnosis*, 11, 179-183. doi: 10.1080/15504263.2015.1100472. Journal Impact Factor = 0.80. Accepted 12 October 2015.

### *Authors' contribution to this paper:*

The candidate is the first author and assisted in developing the research questions for this paper, conducted the data analysis, drafted the manuscript and finalised the manuscript based on co-authors' editorial feedback. The other authors developed the original protocol, assisted in data analysis and provided editorial feedback. The last author assisted in data collection.

### *Overview of this paper:*

Based on the previous quantitative paper, numerous factors have been identified that contribute to cessation of CU in individuals with psychosis. Research does not appear to identify consistent factors and an exploration of such factors using qualitative methodology may improve our understanding. This study retrospectively examines reasons for cannabis cessation, strategies that maintain cessation and relapse contexts in a group of individuals with early episodes of psychosis.

See Appendix B for the demographic questionnaire, timeline and timeline questions and qualitative questions used in this paper.

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The following is the format for the required declaration provided at the start of any thesis chapter which includes a co-authored publication.

The authors listed below have certified\* that:

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2. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
3. there are no other authors of the publication according to these criteria;
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Shane Rebgetz QUT Verified Signature 16/08/2016	Developed the research protocol, conducted qualitative interviews which form the results of this paper, transcribed interviews and performed data analysis, wrote draft manuscript and completed editorial changes prior to submission.
Leanne Hides QUT Verified Signature	Assisted with data analysis and provided editorial feedback.
David Kavanagh QUT Verified Signature	Assisted with the development of the research protocol and data analysis and provided editorial feedback.
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16/08/2016  
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## **Original article – Brief Report**

**Title:** Natural recovery from cannabis use in people with psychosis: A qualitative study

**Short Title:** Natural recovery from cannabis use

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## **Abstract**

**Objective:** There is rapidly growing evidence of natural recovery from CUe in people with psychosis, but little is known about how it occurs. This qualitative study explores what factors influence the decision to cease CU, maintain cessation and prevent relapse.

**Methods:** Ten people with early psychosis and lifetime cannabis misuse, who had been abstinent for at least a month, were recruited from public adult mental health services. These six men and four women participated in a semi-structured qualitative interview assessing reasons for addressing CU, effective change strategies, lapse contexts, and methods used to regain control. Interpretative phenomenological analysis was used to identify themes in their responses.

**Results:** Participants had a mean age of 23 years ( $SD = 3.7$ ), started using cannabis at age 13.7 ( $SD = 1.6$ ), began daily use at 17 ( $SD = 3.1$ ), and had abstained from cannabis for 7.9 months ( $SD = 5.4$ ). Awareness of the negative impact of SU across multiple domains and the presence of social support for cannabis cessation were seen as vital to sustained success, as was utilization of a combination of coping strategies. The ability to address pressure from substance using peers was commonly mentioned.

**Conclusions:** Maximally effective treatment may need to focus on eliciting a range of benefits of cessation and control strategies, and on maximizing both support for change and resistance to peer pressure. Further research might focus on comparing perceived effective strategies between individuals who obtain sustained cessation versus those who relapse.

*Keywords:* psychosis; substance use; cannabis; natural recovery

## 7.2 INTRODUCTION

Cannabis is the most commonly used illicit substance in people with psychosis, and its detrimental effects on this group are well documented (Hjorthøj, et al., 2009; United Nations Office on Drugs and Crime, 2011). Clinical trials of psychological treatments for CU have not reliably provided strong, well-maintained effects relative to controls (Hjorthøj, et al., 2009; Madigan, et al., 2013).

However, some people with psychosis stop or reduce using cannabis, without clinical interventions (Childs, et al., 2011; Lobbana, et al., 2010), and a reason for weak or inconsistent effects of trials is that control groups also typically improve (Kavanagh & Mueser, 2010). An increased understanding of natural recovery may provide ideas for strengthening interventions. Our recent review of existing research found that people with psychosis had similar reasons for addressing their use as other cannabis users (Rebgetz, Kavanagh, et al., 2015a). The main differences in reported reasons related to potential symptom exacerbations and amplified functional problems, such as homelessness, that occur in co-occurring disorders. However, only seven studies had examined subjective experiences of ceasing or reducing cannabis among this population (Rebgetz, Kavanagh, et al., 2015a).

Qualitative methods may provide additional insights into the issue. The current study elicited qualitative responses on ways people with a psychosis recovered from CU, including their triggers for addressing it, challenges they encountered, coping strategies they employed, and if they relapsed, the context in which that occurred.

## 7.3 MATERIALS AND METHODS

### *Participants*

Participants were recruited from adult mental health services in the Metro-North Health Service District in Brisbane. Ethical approval was obtained from The Prince Charles Hospital Human Research Ethics Committee and carried out in accordance to The National Statement on Ethical Conduct in Human Research. Inclusion criteria were: (i) current diagnosis of a psychotic disorder; (ii) an early stage of psychosis (< 3 psychotic episodes); (iii) history of cannabis misuse, (iv)  $\geq 1$  month abstinence from cannabis in the previous 3 years, and (v) ability to read and speak English without translation. Exclusion criteria were a primary diagnosis of organic psychosis, psychosis due to a general medical condition, mental retardation, developmental disorder or amnesic disorder.

### *Procedure*

Case managers gave potential participants information about the project and referred those who expressed interest. The lead author then contacted volunteers to confirm eligibility and negotiate a time for the interview, at which time written informed consent was obtained. Participants were reimbursed \$20 for their costs.

### *Data Collection*

The Operational Criteria Checklist (OPCRIT; McGuffin, et al., 1991) was used to confirm the presence of current psychotic disorder, based on the medical record. A timeline was completed, with the initiation of alcohol and other drug use, commencement of daily CU, times they used more or less than usual, times they abstained for  $\geq 1$  month, together with the onset of psychotic experiences, when first diagnosed, and their history of hospitalisations.

A semi-structured interview assessed reasons for addressing their CU, effective change strategies, lapse contexts, and methods used to regain control. Interviews were audiotaped. Questions used information from the timeline, and included: (1) “Tell me about the last time you stopped using cannabis. What was happening around then? Why did you stop using it that time?” (2) “When you weren’t using cannabis, were there times when that was hard?” and if they used cannabis again, (3) “What was happening when you went back to using cannabis?”

### *Data Analysis*

Interviews were transcribed by the first author and analysed using interpretative phenomenological analysis (IPA; Smith & Osborn, 2003). The first narrative was used to identify preliminary themes, and representative quotations illustrating them were compiled. This process was repeated for the remaining narratives. To ensure transparency and reliability, all transcripts were read, analysed and coded by at least one other author. Coding and interpretations were discussed among all authors until consensus was reached on the key themes, allowing inconsistencies to be debated and themes refined (Lobbana, et al., 2010). Interconnections between interviews were examined, and a list of master themes constructed. Selection of master themes was based on their representativeness and on richness within participants’ accounts (Smith & Osborn, 2003). Since all authors had training in CBT and MI, potential related biases concerning the interpretation of results were identified and monitored (e.g., tendencies to interpret responses as reflecting cognitive or motivational interviewing concepts).



## 7.4 RESULTS

### *Participant characteristics*

Participants were six males and four females with a mean age of 23 years (SD = 3.7; range 19-29). Four were diagnosed with schizophrenia and six with schizophreniform disorder. On average, they had 11.1 years of completed education (SD = 0.9), none were employed, and only one was in a relationship. Eight had a history of psychiatric admission, and their average age at diagnosis of psychosis was 20.5 years (SD = 3.5). On average, they started using cannabis at age 13.7 (SD = 1.6), began daily use at 17 (SD = 3.1), and reported 5.4 years of regular use (SD=2.6, range 2-9). All had used alcohol, three had used opioids and two had used hallucinogens. Participants had abstained from cannabis for 7.9 months on average (SD = 5.4; range 2-18). Two had previously received minimal treatment for SU (a motivational interviewing session or psychoeducation), but no intervention was associated with participants' focal cessation attempt.

### *Reasons for cessation*

Six master themes were identified: health, finance/employment, social pressure, mental health, dissatisfaction with cannabis, and legal issues. Themes, subthemes and sample quotations are in Table 7.1.

### *Strategies for maintaining cessation*

The strategies participants utilized to maintain cannabis cessation were ordered into five master themes: cognitive, significant other/family, behavioural, finance/employment, and lifestyle (Table 7.2).

### *Relapse*

Five participants reported a relapse after cannabis cessation. Themes related to: relapse triggers (including stressful events), the desire to slow down thoughts or cope with cravings, the presence of substance-using peers, and boredom.

## 7.5 DISCUSSION

Reasons for cessation in this sample were highly consistent with those from previous research (Rebgetz, Kavanagh, et al., 2015a). Increased appreciation of negative consequences of cannabis upon multiple life domains emerged as often being critical. While existing approaches attempt to increase insight into negative consequences of use, the current study

suggested that either a summative effect on multiple domains or a strong individually-specific motivator may be needed to trigger change. Given that people with psychosis often have working memory deficits, assistance in assessing the combined impact of multiple factors may sometimes be needed (e.g., via pictorial representation). Further investigation of ways that recovered users addressed this challenge may offer important suggestions on how treatment interventions can more effectively assist people in assessing the impact of their use on multiple life areas.

Awareness of adverse impacts of cannabis on mental health symptoms played a particularly important role in both initiating and maintaining a change attempt. Participants identified two related but separable insights: awareness that cannabis exacerbated paranoia, depression and anxiety, and expectations of symptom improvements upon cessation. Either insight alone may be sufficient in triggering cessation if it is highly valued, while both may be essential under other circumstances.

Thinking about incentives (social reinforcement, improved finances, reduced mental health symptoms) provided coping strategies as well as triggers for change. Friends also assisted by restricting supply, and users altered their social environment by staying away from users or asking users not to smoke in front of them. Activities provided distractions, but also offered other sources of relaxation and enjoyment, and filled time with rewarding behaviours that were inconsistent with SU (e.g., employment, exercise). Some users appeared to adopt overarching goals (e.g., stopping all SU, becoming fit and healthy, improving mental health) that motivated multiple behavioural changes, which presumably reduced exposure to substance-related cues (e.g., quitting tobacco smoking reduces exposure to cigarettes) and established mutually reinforcing changes (e.g., exercise becomes easier when people stop smoking), as well as competing for time with CU. Therapists may sometimes be concerned that multiple concurrent behavioural changes are too difficult for this group; the current results suggest that people with psychosis may find multiple changes beneficial if they link to a coherent valued goal. In fact, we speculate that such a goal may help to insulate users from the effects of fluctuating insight into links between cannabis and worsening symptoms.

Identified triggers for relapse paralleled ones that are well established in non-psychotic populations (Marlatt & Gordon, 1980). However, it is possible that triggers present greater challenges for this group. For example, pressure from others who continue using cannabis may be particularly difficult, since this group commonly has narrow social networks (Jablensky et al., 1999), accentuating the potential impact of further relationship loss, and

deficits in verbal communication and negotiation (Langdon, Coltheart, Ward, & Catts, 2002). While drug refusal skills are commonly taught and attempts are made to help clients maintain and expand their networks, these issues probably form important barriers to sustained change. Cognitive deficits are also likely to impair abilities to cope with stressful events and cravings. Further insight into strategies some former users successfully employ to deal with stress and cravings may provide hints on ways to prepare for them more effectively.

This qualitative study appears to be the first to distinguish between factors supporting the initiation of cannabis cessation, strategies to maintain abstinence, and risk factors for relapse, in people with psychosis. The emergence of distinct themes across these phenomena suggests that treatments may need to emphasise different aspects at each point. While the study had a small sample, this was consistent with a qualitative approach, and recruitment continued until no new themes emerged (Baker & Edwards, 2012). Participants were all in contact with mental health services, and their responses may have been affected by interactions with staff. Our results should be confirmed in community samples with less service exposure. While the team's biases were identified and discussed, this may not have averted influences on the derived themes, and our perspectives clearly influenced discussion of their implications. Participants' responses were potentially affected by the order of questions and recall biases. These risks may be reduced by repeated assessment over time using both qualitative and quantitative approaches. Future research could also benefit from comparing responses of people who successfully quit to those who were unsuccessful in their quit attempt.

## **7.6 CONCLUSION**

Several themes of the current study were consistent with past research, but some raised new potential directions for treatment. Increasing awareness of adverse impacts of CU across multiple life domains may maximize motivation and avoid overdependence on one aspect. Developing overarching goals such as fitness may embed cannabis cessation within less stigmatizing contexts and assist in drug refusal. Discovering specific difficulties this group has with well-established high-risk situations may guide more effective relapse prevention. Further investigation of these hypotheses is indicated.

## **7.7 COMMENTARY (SUMMARY AND IMPLICATIONS)**

This is the first study to explicitly explore the three areas of cessation, maintenance and relapse to determine differences at each stage of change. Qualitative interviews were conducted with ten participants to identify common themes. Reasons for cessation mirrored other studies in this area; with awareness of the negative impact of SU across multiple domains and the presence of social support commonly endorsed cessation strategies. A variety of maintenance strategies were reported including those related to increased mental health symptoms. A number of relapse triggers were identified however further research needs to explore this area. As the current study was retrospective in nature recall bias may impact the results and a prospective study would address this concern.

While treatment for mental health difficulties (i.e., psychosis) was not explicitly explored during the study; each participants was currently involved with mental health services. Mental health services in which participants were linked focus primarily on treatment (case management) of the individuals mental health; including risk assessment and management, mental status examination, mental health act related activities, medication, linkage with non-government agencies and supportive counselling.

Table 7.1 Reasons for Cannabis Cessation

Master Theme	Subthemes	Example quotation
Health	Improve physical health, quality of life Thoughts about death and fear of dying	“the year up to quitting I was thinking I was dying; I want to get fitter” “I thought that I could get healthy, I noticed that my breathing was much better when I was not using”
Finance/employment	Improve finances Loss of licence and employment	“weed is really expensive. All my pay would go on it” “I lost my licence and I pretty much lost my job to as I can’t to work with no licence”
Social pressure	Partner/friends (significant others) wanted me to quit, support me to quit Motivation by doctor to quit due to health concerns/mental health staff Interpersonal stress	“being advised by my friends to stop” “I spoke with a nurse and after this I stopped using” “I was having a kid, so I had to get my life together”
Mental health	Worsening symptoms	“I would smoke a cone and get really bad anxiety”
Dissatisfaction with cannabis use	Thoughts about not needing it anymore Loss of enjoyment in using Guilt	“I don’t need them [drugs] anymore” “I stopped enjoying using pot” “letting down my family”
Legal		“I thought they were going to drug test me so I stopped”

Table 7.2 Strategies for Maintaining Cannabis Cessation

<b>Master Theme</b>	<b>Subthemes</b>	<b>Example quotation</b>
Cognitive strategies	Thinking about worsening of mental health symptoms	“how bad it can make you feel sometimes instead of something that makes feel happy”
	Distraction	“just played video games”
	Positive Self-talk	“I believed in myself that I wouldn’t get back into it”
Significant other/family	Social reinforcement, restricting supply	“my friends didn’t let me”
Behavioural strategies	Exercise	“I was going to the gym”
	Pleasant or relaxing activities	“walking the dog, I find relaxing, just walking him around the block”
Finance/employment	Not wanting to waste money	“I hate dishing money to worthless things you know”
	Employment	“gaining employment and having more money”
Lifestyle	Cessation of alcohol and other substances	“I found giving up cigarettes helped”
	Avoidance of high risk situations and other users	“lock myself away. Stay away from friends that smoke and ask them to not smoke in front of you and put it away”
	Healthy eating	“diet is important”
	Drug refusal	“just saying no, no, no; you just have to say no”

Table 7.3 Relapse to CU

<b>Master Theme</b>	<b>Subthemes</b>	<b>Example quotation</b>
Triggers	Stressful events Slow down thoughts Cope with cravings Presence of substance using peers Boredom	“I broke up with my girlfriend who was pregnant” “because I was stressed I reckon, it was to help relax... give my mind a rest” “I was fanning for a cone after stopping for a year” “then your friends are having it and it will start off with just have one, and then you have two and then you have more and then you have more and your addicted again” “I just got bored”

# Chapter 8: Paper 7

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## 8.1 NOTES

### *Citation for this paper:*

Rebgetz, S., Hides, L., Kavanagh, D. J. & Choudhary, A. (2016). Prospective recovery of cannabis use in a psychotic population: A qualitative analysis. *Addictive Behaviors Reports*. Accepted 16 July 2016.

### *Authors' contribution to this paper:*

The candidate is the first author and assisted in developing the research questions for this paper, conducted the data analysis, drafted the manuscript and finalised the manuscript based on co-authors' editorial feedback. The other authors developed the original protocol, assisted in data analysis and provided editorial feedback. The last author assisted in data collection.

### *Overview of this paper:*

Addressing the issue of recall bias in the previous retrospective study, this study prospectively explored cannabis cessation, maintenance strategies and relapse contexts among a group of early psychosis participants. Qualitative interviews were conducted over a three month period to identify themes across these three areas.

See Appendix C for the demographic questionnaire, qualitative questions and BPRS.



### Statement of Contribution of Co-Authors for Thesis by Published Paper

The following is the format for the required declaration provided at the start of any thesis chapter which includes a co-authored publication.

The authors listed below have certified\* that:

1. they meet the criteria for authorship in that they have participated in the conception, execution, or interpretation, of at least that part of the publication in their field of expertise;
2. they take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;
3. there are no other authors of the publication according to these criteria;
4. potential conflicts of interest have been disclosed to (a) granting bodies, (b) the editor or publisher of journals or other publications, and (c) the head of the responsible academic unit, and
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Rebgetz, S., Hides, L., Kavanagh, D.J. & Choudhary, A. (2016). Prospective recovery of cannabis use in a psychotic population: A qualitative study. *Addictive Behaviors Reports*. Accepted 16 July 2016. Published Reference.

Contributor	Statement of contribution*
Shane Rebgetz QUT Verified Signature .16/08/2016	Developed the research protocol, conducted qualitative Interviews which form the results of this paper, transcribed Interviews and performed data analysis, wrote draft manuscript and completed editorial changes prior to submission.
Leanne Hides QUT Verified Signature	Assisted with the development of the research protocol and data analysis and provided editorial feedback.
David Kavanagh QUT Verified Signature	Assisted with the development of the research protocol and data analysis and provided editorial feedback.
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**Original article****Prospective recovery of cannabis use in a psychotic population: A qualitative analysis.**

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**Number of tables:** 3

**Running Title:** Recovery of cannabis in psychosis

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## **Abstract**

*Introduction:* There is growing evidence for natural recovery from cannabis use by people with psychosis, but mechanisms underpinning it need further exploration. This study prospectively explored this issue.

*Method:* Twenty-two people with psychosis and cannabis misuse were recruited: 19 provided data for at least one follow-up assessment, and 13 of these (68%) reduced or ceased using cannabis. A semi-structured interview with the latter group explored reasons for initiating the attempt, strategies they employed, and context/s where any relapse occurred. Interpretative phenomenological analysis was used to identify themes.

*Results:* Participants who reduced or ceased cannabis use had fewer negative symptoms at baseline, and were more likely to only use cannabis. Major reasons for starting an attempt were worsening mental health, relationship and lifestyle difficulties. Effective strategies fell into psychological, relationship, lifestyle and medication themes. Only three participants reported a relapse: triggers involved substance-using peers, relationship difficulties, and problems with negative emotions including ones from past trauma.

*Conclusions:* An encouragingly high rate of maintained reductions in cannabis use was seen. Increased awareness of the benefits across multiple life domains from addressing cannabis use may be critical to the initiation and maintenance of attempts, both to maximise motivation, and avoid over-dependence on improvements in any single domain. Negative symptoms, multiple substance use, dysphoria and pressure from substance-using peers clearly offer additional challenges for control.

*Keywords:* psychosis; substance use; cannabis use; natural recovery

## 8.2 INTRODUCTION

Up to 80% of people with psychosis report CU, which has been associated with a range of adverse psychological, social, and physical health outcomes (Hjorthøj, et al., 2009; van der Meer, et al., 2015). Clinical trials of psychological treatments for CU in people with psychosis have not consistently reported better outcomes than control conditions (Hjorthøj, et al., 2009; Rebgetz, Kavanagh, et al., 2015a). This indicates that some people with psychosis cease or reduce using cannabis with little or no related treatment (Childs, et al., 2011; Lobban, et al., 2010). An increased understanding of such ‘natural recovery’ could be used to strengthen current treatments.

In a recent review, we found people with psychosis had similar reasons for reducing SU to those reported in the general population (Rebgetz, Kavanagh, et al., 2015a). Any differences in these reasons were related to the presence of the psychotic disorder (e.g. symptom exacerbation) and the amplified functional problems (e.g. homelessness) that occur when someone with psychosis also misuses a psychoactive substance. However, only eight studies have examined the subjective experience of ceasing or reducing cannabis among individuals with psychosis (Rebgetz, Hides, Kavanagh, & Choudhary, 2015; Rebgetz, Kavanagh, et al., 2015a), and there is little examination of mechanisms underpinning the phenomenon.

Qualitative methods have begun to provide additional insights into the strategies used by this population. Our recent study found that cessation was linked to the individual’s awareness of the multiple negative consequences of CU or a more specific motivator (e.g., loss of employment; Rebgetz, Hides, et al., 2015). Maintenance strategies were associated with the awareness of the impact of CU on mental health symptoms, thinking about incentives and support from others. Reasons for relapse were found to be similar to non-psychotic groups including pressure from others, stressful events, coping with cravings and boredom (Rebgetz, Hides, et al., 2015).

The retrospective nature of the qualitative studies that have explored recovery from CU increases the risk of recall bias. The current study prospectively explored factors influencing the decision to cease and maintain cannabis cessation over a 3-month period among people with early psychosis. Change strategies and the relapse context of individuals who ceased and then resumed CU were also explored.

### 8.3 MATERIALS AND METHODS

#### *Participants*

Participants were recruited from adult mental health services in the Metro-North Health Service District in Brisbane [All participants were inpatients at the time of recruitment]. They were required to (i) have a current diagnosis of a psychotic disorder (e.g., schizophrenia, schizophreniform disorder, schizoaffective disorder, psychotic disorder NOS); (ii) be in early stages of psychosis (less than three psychotic episodes measured on a Timeline Followback or medical record) and (iii) have used cannabis in the previous 4 weeks. Participants were required to be able to read and speak English without translation. Exclusion criteria were a primary diagnosis of organic psychosis or psychosis due to a general medical condition, intellectual disability, or a developmental or amnesic disorder.

#### *Data Collection*

*Demographic and clinical data* included gender, age at interview, years of education, employment and relationship status, ethnicity, living arrangement at interview, current diagnosis, medication, family history of mental illness, psychiatric and cannabis treatment history.

*Psychosis and symptoms.* The Operational Criteria Checklist (OPCRIT; McGuffin, et al., 1991) was used to confirm the presence of a current psychotic disorder, based on the medical record. Psychiatric symptoms were monitored using the Brief Psychiatric Rating Scale (BPRS; Overall & Gorham, 1962). BPRS positive, negative and depression-anxiety subscale scores were derived at baseline only (Ventura et al, 2000). BPRS items that did not require interviewer observation were included in telephone interviews during follow-up.

*Cannabis use.* Consumption of cannabis and other substances in the preceding 4 weeks was retrospectively assessed using a Timeline Followback (TLFB; Sobell & Sobell, 1992), in which recollections of past events were used to cue recall of SU. Participants were also given a calendar to mark the days they smoked cannabis over the month between follow-up assessments.

*Semi-structured interviews.* If participants had ceased or reduced use since the previous assessment (indexed by  $\geq 50\%$  reduction in quantity), they were asked when this occurred, what was happening in their lives, why it occurred, any times it was hard to stay in control and how they did so. If they went back to using, they were asked what was happening and what led them to going back to using. If relapsing participants subsequently attempted to

regain control of their CU, the interview protocol included questions about the methods they used to do that. The qualitative interviews lasted approximately 60-70 minutes long.

### *Procedure*

Participants were referred to the study by their treating team. The principal service provider gave potential participants oral and written information about the research project and asked if they would like to participate. The lead author then met with the potential participants to obtain informed consent, which included information about the assessment process. At baseline, demographic data was obtained, and the OPCRIT, BPRS and TLFB were administered. Monthly telephone follow-up assessments were conducted using the BPRS and TLFB. Each participant was provided with a calendar to assist with the completion of the TLFB. They were asked to record days they used cannabis and other substances as well as information on any mental health symptoms they experienced during the month. The qualitative interviews were undertaken during this phone call. Participants were reimbursed \$10 at baseline, \$15 at Month 1, \$20 at Month 2 and \$30 at Month 3. Ethical approval to conduct the study was obtained from the Brisbane Metro South and Queensland University of Technology Human Research Ethics Committees (HREC/12/QPAH/ 606).

### *Design*

Participants were assessed at baseline, and attempts were made to follow them up monthly to 3 months. Those who had ceased or reduced their cannabis consumption during the previous month (indexed by  $\geq 50\%$  reduction in quantity from baseline levels) were asked the qualitative questions. Table 8.1 provides an overview of each participant's cannabis use and participation in qualitative interviews over the course of the study.

### *Qualitative Analysis*

Interviews were transcribed by the first author, and were then analysed using interpretative phenomenological analysis (IPA; Smith & Osborn, 2003). The first interview was reorganised and interpreted to identify preliminary themes and patterns, with a list of representative quotations illustrating each theme compiled. This procedure was repeated for each remaining interview, resulting in the identification of new themes. The identification of themes for each research question was completed separately. To ensure transparency and reliability, all transcripts were reread and coded by at least one other member of the research team. Coding and interpretations of the transcripts were discussed by all authors in detail

until consensus was reached on the key themes. This approach allowed inconsistencies to be debated, and themes to be refined (Lobbana, et al., 2010). Interconnections between interviews were examined, and a list of master themes constructed. Selection of master themes was based both on the frequency or “representativeness” of specific themes and on the richness of the theme within an individual’s account (Smith and Osborn, 2003). Since all authors had training in cognitive behavioural therapy (CBT) and motivational interviewing (MI), potential related biases in the interpretation of responses were discussed.

## 8.4 RESULTS

### *Participant characteristics*

Twenty-two participants consented to take part in the study: 19 of these (86%) provided at least 1 month of follow-up data, and 16 (73%) completed all 3 months of assessments. Five of those who dropped out of the study were lost to contact by the researcher and the health service, and the remaining participant withdrew because of work commitments. There were no demographic or clinical differences between those who completed the study and those who dropped out of the follow-up assessments.

All participants were inpatients at the time of the baseline assessment, and were community patients at each follow-up point. All were prescribed antipsychotic medication while an inpatient, with 16 participants being prescribed paliperidone 100mg. Only two participants reported receiving any previous cannabis use treatment and all were receiving mental health support. No participants said that they had received substance use treatment during the study, and only one participants file mentioned receiving psychoeducation for psychosis and cannabis use.

Comparisons of participants who did and did not reduce their cannabis consumption at some point assumed that the three who provided no follow-up data did not change their usage. Those who reported reduced CU were more likely to have only used cannabis ( $\chi^2(1, N = 22) = 7.8, p = .005$ ) and had fewer BPRS negative symptoms ( $\rho = .55, n = 22, p < .01$ ) at baseline (see Table 8.2). There were no other significant differences between these groups.

One-way repeated measures ANOVAs assessed changes in CU and BPRS symptoms over each follow-up period. The 16 participants providing data to 3 months had a significant reduction in the average number of days cannabis was used in the preceding month (baseline  $M = 17.13, SD = 6.51$ ; 3-month  $M = 7.56, SD = 7.39$ ;  $F(3,13) = 6.61, p < .01$ ), and in the amount of cannabis used per month than at baseline ( $M = 4.75, SD = 1.84$ ; 3-month  $M =$



1.88, SD = 1.82;  $F(3,13) = 8.91, p < .005$ ). Significant reductions on several BPRS symptoms were also found: Emotional Withdrawal (from  $M = 2.00, SD = 0.97$ , to  $M = 1.38, SD = 0.81$ ;  $F(3,13) = 3.58, p < .05$ ), Guilt (from  $M = 2.63, SD = 1.41$ , to  $M = 1.69, SD = 1.25$ ;  $F(3,13) = 5.12, p < .01$ ), and Unusual Thought Content (from  $M = 2.75, SD = 0.78$ , to  $M = 1.88, SD = 1.02$ ;  $F(3,13) = 3.43, p < .05$ ).

#### *Reasons for cannabis reduction/cessation*

Three themes were identified: mental health, social relationships/connection and lifestyle change. These themes are summarised in Table 8.3.

The understanding of the negative psychological consequences associated with ongoing CU on a range of levels was highlighted by participants. *Worsening of mental health* was identified as a key motivator for ceasing cannabis, particularly relating to negative experiences from using cannabis and the worsening of psychiatric symptoms:

Well I just had this unpleasant experience..... I was just scared and like I don't want to end up back in hospital. - I thought people were out to get me.... Just trying to sort out my mental health issues. (P14)

A realisation that cannabis did not help with emotional difficulties or was inconsistent with key values or goals (internal conflict) was also commonly reported:

I realised that it wasn't helping me, the hurt was still there when I was sober...(P5)

I just saw that my life wasn't going anywhere...(P11)

Receiving medication or other treatment, or being hospitalised also played a role:

...Well it was when I came into hospital.....Well I have been linked in with a case manager. They are helping me sort out my head. I have the psychiatrist to see.... Well they have me on this medication also...(P14)

The second theme related to *social relationships*. Social contexts and relationships are clearly important in the recovery of substance use. Letting others down was mentioned by participants:

Because it was horrible, I thought I was going to die and not be able to continue to support my partner. He is in a wheelchair. I felt I could not leave him, you know what would happen to him if I was to die. (P1)

Trusting others was identified by this participant as important:

Well it was sort to do with trusting people. I have difficulties trusting people and this causes difficulties in my relationship with my partner. Just help with that, you know...(P1)

Having support from others and a change of social network were also seen as important:

My mum came and saw me and I met some nice people. The staff on the ward were really kind to me also. I just thought I would try and give it a go.... I just didn't want it to keep messing with my head. I wanted to try and stay clean so I could have a relationship with mum, try and make some new friends.... Yes, just trying to be a bit more social. (P20)

Another common reason for cannabis cessation/reduction was related to *lifestyle change*. Participants reported that engaging in education/employment and finances triggered changes in their use potentially by providing an alternate to using substances and giving meaning in their daily lives:

I was just having trouble with work. My mind was all over the place. I just didn't think it was helping anymore. (P16)

It sort of stopped me doing things also like having the motivation to get to work. (P7)

I say to myself don't do it you cannot afford it. There are things you need to spend your money on like my son. (P11)

These themes point to the ability to manage psychological difficulties and a strong emphasis on the role of external factors in the decision to make a change in ones CU. For example Participant 2 reported:

...I had this admission to hospital where I met you the first time. I thought I was going crazy and the voices were telling me to take all my medication.... the voices became worse" and "I felt really guilty that I was stuffing up my children's lives...I just saw the impact it was having on my children. I didn't realise how much it affected them. I have

stuffed up their lives and I didn't know how much...Also about my mum's health and I feel like I have stuffed up her life.

Importantly it is likely that a combination of motivators is required for a person to make an effective change and the realisation of the severity of the consequences of substance use experienced by participants. This was highlighted by a number of participants. For example Participant 5 reported:

I realised that it wasn't helping me, the hurt was still there when I was sober... Well with my parents, it was mainly my Dad. I think they knew I smoked but I didn't want to have to admit it to him and be a disappointment to him... Not really. I guess I wasn't hanging out with the same people and I used to smoke with my ex, so it was different. I was trying to study also and I don't think it was helping me out there.

Participant 7 said:

I just didn't want to feel that way anymore.... Not really it was just getting depressed and I don't reckon the weed was helping me. I think it made me more emotional also... Well I thought if I quit smoking weed I might feel better. I guess I also didn't want to let my mum down. My mum also tells me to get to work. Mum doesn't like me just lying around the house. It sort of stopped me doing things also like having the motivation to get to work. Well I have had a bit more motivation. I still feel weird but I am trying to go to work.

Table 8.1 Participation and cannabis use

Participant	Baseline	THC use	1 month	THC use	2 months	THC Use	3 months
	THC use		Qualitative Interview		Qualitative Interview		Qualitative Interview
1	Yes	No - A	√	No - A	√	No - A	√
2	Yes	Yes - R	-	No - A	√	No - A	√
3	Yes	No - A	√	No - A	√	No - A	√
4	Yes	Yes - U	-	Yes - U	-	Yes - U	-
5	Yes	No- A	√	... <sup>1</sup>	...	...	...
6	Yes	Yes - U	-	Yes - U	-	Yes - U	-
7	Yes	No - A	√	No - A	√	... <sup>1</sup>	...
8	Yes	... <sup>1</sup>	...	...	...	...	...
9	Yes	Yes - U	-	Yes - U	-	Yes - U	-
10	Yes	Yes - U	-	Yes - R	√	Yes - R	√
11	Yes	Yes - R	√	No - A	√	Yes - R	√
12	Yes	Yes - U	-	Yes - U	-	Yes - U	-
13	Yes	Yes - U	-	Yes - U	-	Yes - U	-
14	Yes	No - A	√	No - A	√	... <sup>1</sup>	...
15	Yes	Yes - U	-	Yes - U	-	Yes - U	-
16	Yes	Yes - U	-	Yes - U	-	No - A	√
17	Yes	Yes - R	√	No - A	√	Yes - R	√
18	Yes	No - A	√	No - A	√	No - A	√
19	Yes	... <sup>1</sup>	...	...	...	...	...
20	Yes	No - A	√	Yes - R	√	Yes - U	-
21	Yes	Yes - R	√	No - A	√	No - A	√
22	Yes	... <sup>1</sup>	...	...	...	...	...

1. Lost to follow-up
2. U - unchanged or higher consumption than at baseline
3. R - reduced from baseline (by 50%)
4. A - abstinent

Table 8.2 Demographic, substance use and clinical characteristics of the patients who ceased/reduced (N=13) and did not cease/reduce (N=9) cannabis use

	Reduction/cessation				Reduction/cessation		
	Yes (n = 13)	No (n = 9)	<i>p</i>		Yes (n = 13)	No (n = 9)	<i>p</i>
<i>Demographics</i>				<b>Diagnosis, N (%)</b>			0.21
Age, M (SD)	25.8 (4.1)	23.9 (6.0)	0.38	Schizophrenia	5 (39%)	4 (44%)	
Gender, male, N (%)	10 (77%)	6 (67%)	0.60	Schizophreniform Disorder	4 (31%)	4 (44%)	
Employed, N (%)	5 (39%)	1 (11%)	0.11	Substance-Induced	-	1 (11%)	
Living arrangements, Live Alone, N (%)	0 (0%)	1 (11%)	0.12	Schizoaffective Disorder	4 (31%)	-	
Ethnicity, Australian born, non-Aboriginal, N (%)	11 (85%)	8 (89%)	0.68	<i>Symptoms on BPRS</i>			
				Total, M (SD)	44.6 (9.5)	47.8 (17.2)	0.82
Years of education, M (SD)	12 (1.6)	10.7 (1.3)	0.90	Negative, M (SD)	7.5 (1.9)	5.7 (1.1)	0.01
Relationship, single, N (%)	12 (92%)	6 (67%)	0.31	Positive, M (SD)	10.0 (2.4)	12.0 (4.5)	0.32
<i>Clinical</i>				Depression-anxiety, M (SD)	9.5 (4.8)	8.1 (3.7)	0.43
First hospital admission, N (%)	8 (62%)	6 (67%)	0.81	Manic-excitement, M (SD)	9.9 (3.5)	12.2 (9.2)	0.87
Number of previous hospital admission, M (SD)	1.5 (0.8)	1.4 (0.7)	0.79	<i>Substance Use</i>			
Prescribed medication, N (%)	13 (100%)	9 (100%)	-	Previous treatment, M (SD)	1 (8%)	1 (11%)	0.80
Family history of psychosis, N (%)	6 (46%)	2 (22%)	0.25	Days used cannabis, M (SD)	18.3 (6.7)	13.3 (5.3)	0.08
Family history of other mental illness, N (%)	5 (39%)	4 (44%)	0.78	Cones per cannabis use day, M (SD)	5.0 (1.7)	3.8 (2.0)	0.01
				Polysubstance use, N (%)	4 (31%)	9 (100%)	0.00

### *Strategies for maintaining cannabis cessation*

Strategies participants used to maintain cannabis cessation/reduction were ordered into four themes: psychological strategies, relationship/connection, social related changes, and medication (Table 8.3).

A wide range of *psychological strategies* was employed, with a variety of strategies likely needed for effective change. A common cognitive strategy was for participants to reflect on past negative experiences and the effect on their mental illness:

The fear of having an unpleasant experience and the cops coming around again stops me from using. I'm worried about having another break down and getting locked up. (P14)

Trying to think about how the pot affects my mental illness. (P2)

For these two participants' motivators for cessation included negative experience and worsening of mental health symptoms. The motivators for change were clearly linked with ongoing effective maintenance strategies.

Other psychological strategies included emotional change:

Just tried not to feel bad and think of not wanting to feel bad again. Realising that smoking weed probably wouldn't help and I would feel guilty afterwards anyway which would make me feel bad. (P7)

Self-belief and self-talk were also seen as important:

Well I just have to get through it. Just telling myself 'no'. It is easy to go back and use. (P11)

Behavioural strategies included playing video games, sleeping, breathing, exercising and engaging in other distracting activity. Having a plan appeared to be an important factor:

Just by making sure I had a plan of what I was going to say if I ran into them. Have an excuse that I was busy. (P18)

*Relationships* played a role in helping participants stay in control, and included the ability to trust others, getting support from others and thinking of others:

Being able to trust them and not feel bad when I need time out..... my partner helps me.... I speak with my mum... I think of the kids. I don't want to stuff them up even more.....think about how much I have already messed the kids up. (P2)

Changing their *social network or lifestyle*, and taking *medication* (e.g., antipsychotics) were cited as other ways participants stayed in control.

For participants to stay in control, the realisation that any short-term relief from cannabis was outweighed by more positive outcomes was important. An example was provided by Participant 5 who reported:

Well I just felt like I couldn't be by myself. I felt that if I smoked it would be easier. But I knew that it wasn't going to make it better, I'd feel the same the next day. Anyways I had gotten past the addiction so I just had to keep off it.

Many maintenance strategies identified in by participants was similar to the initial reasons for change. An example is provided by Participant 1 who reported an initial reason as:

I had this negative experience where after having bongs I collapsed to the floor. I was really scared and I was never going to use again as a result.

And maintenance strategies as:

Thinking about that time when I collapsed on the floor. I never want that shit to happen again. It really freaked me and my partner out.

Table 8.3 Motivators and effective strategies for reduction or cessation of cannabis use

<b>Motivators</b>	<b>Strategies</b>	<b>Relapse</b>
Worsening Mental Health	Psychological strategies	Substance using peers
Social Relationships/Connections	Relationship/Connection	Difficulties in relationships
Lifestyle Change	Social Related Changes	Coping with difficult emotions
	Medication	



### *Relapse*

Only 3 of the 11 interviewed participants who ceased CU altogether reported a relapse (a return to using cannabis). Their accounts identified the presence of substance using peers, difficulties in relationships and coping with difficult emotions related to past trauma, depressed or lonely feelings as triggers for this relapse:

I was just lonely, my family are not around and I don't have any friends so I just started smoking again..... Just as a comforter, rather than thinking about my childhood. Just to shut my body down for a bit, stop having to deal with it all. (P20)

For those participants that relapsed there appeared to be less emphasis on social aspects in their reported effective maintenance strategies and relationship difficulties and associated negative emotions played a role in relapse.

## **8.5 DISCUSSION**

This qualitative prospective study explored natural recovery from CU among people with early psychosis over 3 months. Consistent with previous research, worsening mental health symptoms were identified as a major reason for reducing/ceasing CU (Rebgetz, Hides, et al., 2015; Rebgetz, Kavanagh, et al., 2015a). Relationship issues were identified as another major reason for making a change in CU particularly concerns about letting others down. While these issues appeared to be powerful motivators for change, a focus on past difficulties may undermine self-efficacy and coping. Focusing users' attention on instances where they maintained control of CU and fulfilled their responsibilities may allow these concerns to sustain a control attempt without triggering distress and hopelessness.

Relationships with others were also identified as key motivator for maintaining cannabis reduction/cessation. Maisto and colleagues (1999), also found the receipt of emotional and practical support was a key therapeutic factor in reasons for change for SUD in schizophrenia. Treatments focused on developing and maintaining healthy relationships could help to reduce the use of illicit drugs to cope with problematic attachments (Alexander, 2008).

An important finding of the current study was the breadth and severity of the adverse SU consequences experienced by participants. As we identified in our recent review (Rebgetz, Kavanagh, et al., 2015a), the psychotic symptoms, distress, narrowing of social networks and activities and poverty that are experienced by people with psychosis, renders

this group particularly susceptible to negative effects of SU on relationships, discretionary incomes, activities and wellbeing. The negative nature of some of these experiences is likely to amplify motivation to reduce CU, to the extent seen among more extreme substance users in the general population (which may help to explain the frequency of their attempts to control use, even when the amounts consumed are relatively small). Among these impacts were financial and employment-related reasons for change, which have also been identified in previous research (Rebgetz, Kavanagh, et al., 2015a). Emphasising the negative effects of cannabis on multiple life domains may maximise the chance that people with psychosis will begin an attempt to control CU and may offer a key to successful control (Green, Yarborough, Polen, Janoff, & Yarborough, 2015).

While distress about these issues may be motivating, difficulties dealing with distress more generally constituted a perceived risk for control, as did the limited range of coping mechanisms they appeared to have to cope with it. In common with dysfunctional SU in other contexts, maintenance of control required relinquishing any short-term relief from cannabis in favour of more positive distal outcomes. Where people with psychosis have experienced trauma, maintaining control despite negative emotions may be particularly challenging. Links between lifetime cannabis consumption, childhood abuse and psychosis are well documented (Houston, Murphy, Adamson, Stringer, & Shevlin, 2008; van Dam et al., 2015). There were some indications in the current study that trauma may be important, particularly in relation to relapse, but as only three participants with a trauma history reported a relapse, these results must be viewed with caution. Examination of relationships between trauma and relapse in a larger study may clarify the extent of its role.

Our results are consistent with previous research on relapse in substance users from both the general population and in people with serious mental disorders (Rebgetz, Hides, et al., 2015). They also support relapse models of SU that highlight the interaction between situational risk factors and individual characteristics (Anderson, Frissell, & Brown, 2007), and emphasise the need to develop strategies for emotion regulation as an important component of treatments. Schema therapy may also assist, given emerging evidence on its application to SU by people with personality disorders (Kellogg & Tatarsky, 2012).

This study explicitly distinguished between strategies that may assist with initiating reduction or cessation from those involved in maintaining it. We previously identified a number of strategies that could support users at both stages (Rebgetz, Kavanagh, et al., 2015a). Psychological strategies (remembering negative experience; self-belief; behavioural

change; effect on mental illness), social reinforcement related to family and significant others, lifestyle change and using medication were the main factors which respondents said had helped them stay in control. However, there was a limited range of coping strategies to control use, and these strategies tended to be relatively basic (e.g. escaping a high-risk situation, rather than being able to deal with the risk). Implications include the importance of ensuring that treatments focus on behavioural rather than cognitive strategies, and on ones that are both readily trained and likely to be effective.

This study appears to be the first to prospectively follow a sample of cannabis users with psychosis to qualitatively explore - the initiation of cannabis cessation, strategies to maintain abstinence, and risk factors for relapse in CU. While there were many similarities in the themes relating to these contexts, the emergence of some key differences in responses suggests that treatment approaches may need to emphasise different aspects at each point in the recovery journey. The use of psychological approaches that address emotional issues including any past trauma may be particularly important for relapse prevention.

Limitations of this study include relatively small group of purposively sampled participants. However, recruitment continued until no new themes emerged, which suggests that a larger sample was unlikely to identify additional themes. As all participants were inpatients at the time of recruitment and were under the care of outpatient case managers from their local mental health services during follow-up, it is possible that their responses may have been influenced by their interactions with staff or patients (e.g. reflecting staff opinions of key factors and effective strategies), which were not recorded on file. Only one file mentioned “psychoeducation for psychosis and SU”. While no such interventions were reported as a motivator or maintenance strategy during qualitative interviews, results of the current study should be confirmed in a community sample with less service exposure. Biases relating to the research team’s knowledge of and theoretical adherence to CBT and MI were considered, but that may not have been sufficient to avert an influence from those perspectives on the perceived themes. The perceptions of respondents were potentially affected by the order of questions and by repeated questioning over time. It is also likely that tracking CU may have influenced participants’ decisions in regards to ongoing SU. Future research could minimise these risks by using respondent validation and applying experience sampling or mixed methods (e.g. with a sufficient sample to compare themes within subgroups that have varying mental health symptoms, stress, and motivation).

### *Conclusion*

Increasing people's awareness of the adverse impact of CU across multiple life domains may be critical to cannabis cessation and maintenance of change, both in order to maximise motivation, and to avoid over-dependence on one life area. Development of a range of coping strategies to manage stress, alleviate boredom and deal with pressure from substance-using peers also appears important, if users are to effectively meet these common challenges. Focusing on emotion regulation and developing and maintaining healthy relationships appear to be areas worthy of particular additional exploration.

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## 8.6 COMMENTARY (SUMMARY AND IMPLICATIONS)

This study appears to be the first to prospectively explore cannabis cessation, maintenance strategies and relapse contexts among individuals with early psychosis. Commonly endorsed cannabis cessation was related to mental health, relationships and connection and lifestyle factors. Maintenance strategies were similar in that mental health and relationship and connection are important in addition to social aspects and medication. Relapse contexts were difficult to interpret due to the limited number of participants relapsing. Further research is required to replicate these findings on a larger scale.

While treatment for mental health difficulties (i.e., psychosis) was not explicitly explored during the study; each participants was currently involved with mental health services. Mental health services in which participants were linked focus primarily on treatment (case management) of the individuals mental health; including risk assessment and management, mental status examination, mental health act related activities, medication, linkage with non-government agencies and supportive counselling.

Telephone interviews using the BPRS is not a well-established method and therefore a limitation in regards to the psychiatric measurement of the paper; however this process has been used in previous studies and the items not rated are not crucial for determination of symptoms or relapse (i.e., Hides et al., 2006).

In retrospect, it would have made the data richer if the reasons and contexts associated with those participants who did not change their SU was explored.

Table 8.4 shows an average substantial change for those who ceased/reduced their use between baseline and follow-up time point one which was sustained across the follow-up periods.

Table 8.4 Cannabis use over time

Days used cannabis, M (SD)	No	Yes
B	13.3 (5.3)	18.3 (6.7)
F1	13.3 (5.5)	4.8 (5.7)
F2	17.2 (7.2)	2.4 (4.5)
F3	14.0 (5.6)	3.7 (5.4)
Cones per cannabis use day, M		
(SD)		
B	3.8 (2.0)	5.0 (1.7)
F1	3.8 (2.6)	1.4 (1.8)
F2	3.8 (1.8)	0.7 (1.2)
F3	3.3 (1.5)	1.0 (1.4)

B = baseline  
 F1 = Follow-up 1  
 F2 = Follow-up 2  
 F3 = Follow up 3

# Chapter 9: General Discussion

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## 9.1 OVERALL DISCUSSION

The overall objective of this research was to identify what variables and processes are involved in recovery from CU among individuals with psychosis. Current treatments for this comorbidity have had limited impact. In consequence, this thesis aimed to progress the small research field on natural recovery from CU in individuals with psychosis, in order to identify potential ways that the impact of treatments may be strengthened. Current treatment design for CU in psychosis has not been guided by a strong body of research on natural recovery. Natural recovery may assist in both refining treatments and increasing their impact (Green, et al., 2007; Mueser, et al., 2007).

Paper 1 (Chapter 2) reported a systematic review of the existing literature on natural recovery from SU. A systematic review and meta-analysis was then conducted to examine the CU outcomes of general population samples of cannabis users in control conditions of treatment trials (Paper 2, Chapter 3). A meta-analysis (Paper 3, Chapter 4) of psychotic individuals in the control conditions of cannabis treatment trials followed. A series of natural recovery studies were conducted in Paper 4 to 7 (Chapter 5 to 8), two of which comprised quantitative analyses of existing datasets, and two were new studies that were primarily qualitative.

These papers addressed the overall aims of the research program, namely - What triggers the decision to initiate a change and what are the associated reasons for reducing or ceasing CU among substance users with psychosis? What maintains cannabis cessation among substance users with psychosis? What predicts lapses in control, and what strategies are most commonly used to regain control among substance users with psychosis?

The systematic review of natural recovery in psychosis and SU in Paper 1 highlighted the limited research conducted on this specific topic. The seven identified studies found a range of motivators for reduction or cessation, including issues related to health, finances, family/significant others, legal problems, social functioning and lifestyle, as well as mental health. When these factors were compared to changes in CU in the general population (37 studies), few differences were noted. Exceptions were those of particular relevance to people

with psychosis: motivations to control psychotic symptoms, avoid hospitalization, please treatment providers, and avoid homelessness. Stable psychotic symptoms and close connections with others appeared particularly important for successful control. The small number of studies identified in the psychotic population necessitated the inclusion of both qualitative and quantitative studies that varied widely in quality and the research methods (e.g., assessments) used. The review concluded that further research on natural recovery from CU in psychosis is required, which adopts more robust methodology including a clear definition of abstinence or reduction of use, use of the same psychiatric and SU assessments and using the same follow-up duration. The focus on intervention related to mental illness (psychosis), highlights the need of integrative treatment approaches which has consistently been reported in the literature (Mueser & Gingerich, 2013). The best timing and primary focus of such interventions remains unclear, with these results suggesting a focus on the mental health intervention first may be important.

When the degree that CU reduced in control conditions of RCTs in general population samples was examined in a meta-analysis in Paper 2, consumption frequency was found to reduce by an average of 4.6 days over 2-4 months across eight studies, with a mean reduction across the studies of 0.4 SD. Paper 3 undertook a similar review in trials on CU by people with psychosis. A mean reduction of 0.3-0.4 SD in the frequency of SU over 6-24 months was found in the control groups of eight trials—a reduction that compared favourably with the results of cannabis users from the general population. Together, these reviews provided a benchmark effect size for assessment of interventions, determining the clinical significance, and suggested that at least partial natural recovery from CU appears possible, even in samples with psychosis.

Mean improvements in control groups within people with psychosis were around half these in the general population, however effect sizes at 3-6 months were only 25 percent lower. Comparisons were subject to different durations of follow-up, and the fact that baseline consumption in the psychosis sample was just over half that of the general population samples. The overall picture was of a surprisingly high level of reduction in the psychosis sample.

Paper 4 examined baseline predictors of SU cessation or reduction in 432 patients receiving treatment for FEP. The presence of only CUD (rather than polysubstance use) and higher levels of premorbid social and occupational functioning predicted SU reduction or



cessation at 18-months follow-up. However, the study relied on a retrospective file audit, and combined substances into a single SU variable in its follow-up assessments.

Paper 5 was able to address these limitations in a prospective investigation of predictors of cannabis cessation among 67 inpatients with CU and early psychosis. Baseline predictors of cannabis cessation across 6 months were living in private accommodation and receiving an income.

The results in Papers 4 and 5 are different and given the studies explored the same topic, we would hypothesized the studies would have provided similar results. In contrast, the results could also be seen as consistent, since private accommodation and receipt of an income suggest higher current functioning, which would be predicted by better premorbid functioning. However, private accommodation may also offer specific benefits in reducing exposure to SU or supply by others and may indicate better quality and less depressing context. Employment gives powerful incentives for cessation, provides a daily activity that is inconsistent with heavy use, and an income offers opportunities for alternative pleasurable activities. These findings support the integration of vocational and functional recovery in psychosocial treatments for psychosis (Mueser, et al., 2015).

Alternate explanations as to the importance of income and private accommodation may include that these factors assist individuals to be socially connected with others. Having contact with others at a place of employment and in accommodation may increase one's self-concept and protect against psychotic processes and negate the need to use substances as a coping mechanism. It is likely that private accommodation may also offer safety in people who are often vulnerable and are preoccupied by external threats. Income and accommodation may be overlooked in functional assessments. A needs approach may provide valuable insights for current treatments (Young, Klosko, & Weishaar, 2003).

Kellogg and Tatarsky (2012) have highlighted the importance of therapeutic alliance and identity in the treatment of SU. In regards to alliance a strong therapeutic relationship can be healing as it provides a place of safety, allows the integration of self-regulation or self-management skills the therapist models and teaches and allows a space to resolve interpersonal difficulties which is often associated with pain that underlies SU (Kellogg & Tatarsky, 2012). Changes due to emotional connections with others may start within the therapy relationship. Role identity may assist in motivating people to change their SU. Role identity is linked with social contexts and transforms within this domain, which is a

dialectical process (Kellogg & Tatarsky, 2012). Individuals have a number of identities of which are hierarchical depending on importance in their current lives. Kellogg suggests that people who use substances develop an addict identity (Kellogg & Tatarsky, 2012) which then dominates the hierarchy and reduces emphasis on other identities (i.e., worker, mother). Making a change (with regards to SU) occurs in the process of role conflict such as those identified in this project (i.e., related to health, finances, family/significant others, legal problems, social functioning and lifestyle).

Papers 4 and 5 did not identify the challenges that participants encountered, or the strategies they employed to deal with them. Accordingly, Paper 6 examined these questions in a retrospective qualitative study of ten individuals with CU and early episodes of psychosis whom had ceased or reduced CU for at least a month. Consistent with the previous papers in this research program, cessation or reduction was associated with the motivational themes of health, finance/employment, social pressure, mental health, dissatisfaction with cannabis, and legal issues. In addition, maintenance and relapse factors were explored. Strategies fell into cognitive, significant other/family, behavioural, finance/employment, and lifestyle themes. Contexts for relapse included stressful events, desire to slow down thoughts or cope with cravings, the presence of substance-using peers, and boredom. Limitations to Paper 6 included the retrospective nature of the study.

Paper 7 therefore involved a prospective qualitative study of 22 cannabis-using individuals with early psychosis. Thirteen participants ceased or reduced their use over a 3-month follow-up, and eleven provided qualitative responses. As in the previous study, motivators for cessation or reduction included themes of mental health, relationships/connection and lifestyle change. Strategies for maintaining reduction/cessation were psychological, relationship/connection, social changes and medication. Only three participants relapsed: while substance-using peers were again mentioned, other triggers involved difficulties in relationships, trauma and depressed or lonely feelings.

## **9.2 DISCUSSION OF PAPERS IN RELATION TO PROJECT AIMS**

### **9.2.1 What triggers the decision to initiate a change and what are the associated reasons for reducing/ceasing CU among substance users with psychosis?**

This thesis highlighted a number of factors that contribute to the cessation or reduction of CU among individuals with psychosis, including close connections with people and a stable mental state and (Paper 1), having only one substance to address (rather than poly-

SUDs), better global functioning and better premorbid social and occupational functioning (Paper 4), having private accommodation and receiving an income (Paper 5). Key motivators or triggers for addressing CU include health, finances and employment, social pressure, mental health problems, dissatisfaction with cannabis, legal issues, relationships and lifestyle (Papers 6 and 7). Effective strategies included psychological ones, relationship/connection, social changes and medication.

Previous papers (e.g., Maisto, et al., 1999) exploring strategies used to cease cannabis in people with psychosis have highlighted the importance of underlying emotions and interpersonal connectedness. However, research focusing on this specific issue is limited, and current treatments focusing on the cessation or reduction of CU among individuals with psychosis appear to pay insufficient attention to these factors. CU is commonly reported to be a coping mechanism for dealing with difficult emotional states and assisting people with psychosis to heal their emotional difficulties may reduce their need to rely on cannabis to cope. It is possible that treatment efficacy may be improved by incorporating these themes. Understanding clients' attachment styles (a measure of ability to form close emotional relationships) may also be an important related factor. However, this may not have to extend to a special focus on therapeutic alliance: Berry and colleagues (2015) recently found that therapist-client alliance was not related to clinical or SU outcomes in individuals participating in an RCT of brief MI/CBT compared with longer-term MI/CBT and standard care alone.

Natural recovery studies exploring motivators for SU cessation/reduction in people without psychosis endorsed similar reasons to these. Toneatto and colleagues (1999) also noted social pressure or an ultimatum from significant others, observations of effects on others, financial or health problems, lifestyle concerns, fear of continued use, or just being tired of using in a sample of 50 abstinent ( $\geq$  year) untreated former cocaine users. However, they also found that cognitive evaluation (weight up the pros and cons) was a common reason for cessation, and this factor was not as prominent in the studies in this thesis. It is standard MI practice to assist individuals with a decisional balance. The lack of data supporting this specific approach in the studies within this thesis may help to account for weak treatment outcomes. It is possible that applications of decisional balance sometimes tax the cognitive capacity of people with psychosis—e.g. by asking them to sustain too many items in attention—and that additional work on adapting such treatments to psychosis is needed.

### **9.2.2 What maintains cannabis cessation among substance users with psychosis?**

The current research was the first to specifically explore factors that maintain cannabis cessation in people with psychosis. Previous research on natural recovery from SU in the general population reported similar factors to those in Papers 6 and 7, including improvement in self-concept, change of friends, change in social life, avoidance of social situations in which use may occur, support from significant others, change in drug use, change of address, and employment change (Toneatto, et al., 1999).

For those individuals who were able to achieve cessation/reduction, maintenance strategies were generally similar in domain to the reasons that motivated reduction or cessation, falling into cognitive, significant other/family, behavioural, finance/employment, lifestyle (Paper 6), psychological, relationship/connection, social change, and medication domains (Paper 7). Slight differences between motivators for cessation/reduction and maintenance strategies across the research project were identified. These factors included a larger emphasis on behavioural maintenance strategies and the use of planning and goal setting in one's life. The need for these strategies to be individualised is clearly important. The focus on behavioural pattern breaking is common in the later stages of schema therapy along with using the therapeutic relationship to address future needs (Young, et al., 2003). This process leads to a replacement of existing maladaptive patterns with healthier adaptive behaviours. The goal is to generalise insights and knowledge into behavioural change (Rafaeli, Bernstein, & Young, 2011).

### **9.2.3 What predicts lapses in control, and what strategies are most commonly used to regain control among substance users with psychosis?**

Only a small number of studied participants went back to using cannabis, but the context in which relapse occurred were highly consistent with theories and research on relapse from SU in the general population (Anderson, Frissell, & Brown, 2007; Marlatt & Gordon, 1980). Those studies have identified negative emotional states (including ones from interpersonal conflict) and social pressure as common triggers for relapse, which were also identified in Papers 6 and 7 (Brown, et al., 1989; Ramo & Brown, 2008). Research with adolescents and young adults which identified positive emotional states as a potential risk for relapse was not supported by our studies in psychotic populations. Instead, the current results paralleled those found in previous research on co-occurring SU and SMI, including exacerbations of mental health issues, and reduction of meaningful activities or social supports for recovery (Drake, et al., 2005).

## 9.3 CLINICAL IMPLICATIONS OF FINDINGS

### 9.3.1 Motivators for reduction/cessation

Consistent with a sound application of motivational interviewing, a focus on potential improvements across multiple life domains following cessation or reduction in CU appears to be a crucial factor in effective change, perhaps because it avoids reliance on a single domain (which may or may not actually change). However, the identification of one or more issues of particular value to the individual is also likely to be critical, especially for those whose cognitive impairment limits their ability to retain multiple factors in memory. Maximising early treatment impacts on factors that have broad-ranging effects on quality of life and relapse risk (e.g. drug-free accommodation, employment) is likely to be especially important, which is consistent with best current practice (Kavanagh & Mueser, 2010; Mueser & Gingerich, 2013; Mueser, et al., 2015).

Key differences highlighted in the reviews on people with and without psychosis were related to mental health symptoms and emotional wellbeing, and to an increased emphasis on connections with others (close emotional relationships). These themes were also identified in Papers 4, 6 and 7. Strategies to address these issues need to be implemented in integrated treatments for SU (Kellogg & Tatarsky, 2012; Mueser, et al., 2015). An amplified need for connections with others among individuals with psychosis was highlighted in the results of the second Australian National Survey of Psychosis, which found that experiencing loneliness (80.1%) and having a need for more friends (48.1%) were particularly common. Difficulties around connectedness with others may be related to poor social skills or difficulties dealing with trusting relationships and emotions. Indeed, Maisto and colleagues (1999) concluded that emotional and practical support received over the course of therapy assisted SU recovery. Psychological approaches to addressing these issues may need to adapt emotional processing techniques along with focusing on the therapeutic relationship (i.e., schema therapy, emotion focused therapy) to overcome such difficulties (Berry, et al., 2015). These approaches tend to go beyond those found in standard CBT, which is utilised in research trials of SU and psychosis.

Social networks of people with psychosis rapidly diminish over the early years of their illness, and often result in their only contacts being with their family (with severe cases also including a loss of family) and others with severe mental disorder. There are many reasons for this including the fact that friends become increasingly distant in their life trajectory (due to

education, employment, marriage and family), interests become increasingly polar, distrust of others and social withdrawal increase. There are several implications for cannabis users. The narrowing of these networks to fellow users happens at much lower levels of use than for the general population, resulting in fewer people to model and reinforce non-use. The relationships they do have—e.g. with their drug dealer and fellow users—become more valuable—which reinforces continued use. Their relationships are more chaotic, because of the symptoms and behaviour of the people they are with (as well as their own symptoms) which maintains ongoing use as a coping mode. Psychological interventions targeting these social issues appear to have had a limited impact to date and may need to be revised. Such an approach is found in schema therapy where schema modes may offer a conceptual understanding of these factors due to modes incorporating cognitive, behavioural, emotional and physiological responses. Involving the family in these treatment approaches may offer further therapeutic gains (Lobban & Barrowclough, 2016; Smeerdijk, et al., 2014).

Measuring premorbid functioning may assist in identifying those individuals who require more focus on the treatment of their mental health concerns in order to achieve better CU outcomes. Dual insight into adverse impacts of cannabis on mental health symptoms should be addressed, as only having one type of insight (i.e., cannabis exacerbates mental health symptoms or expectations of improvement in mental health symptoms upon cessation) is likely not enough for change to occur. Addressing functional deficits, as well as preventing the development of poly-SUDs, needs to be integrated into treatment design. Such approaches as early identification and intervention and harm minimisation approaches to focus on only one substance may assist.

Current interventions which focus on a range of MI and CBT strategies to address cessation/reduction are an important aspect of recovery for this population. A number of strategies including exploration of the benefits of cessation/reduction, incentives for change, drug-refusal skills, improving relaxation and enjoyment, and reframing unhelpful thinking patterns have proven effective (Baker, et al., 2006; Mueser, et al., 2015). As mentioned above, the timing of these interventions is not well understood, the need for treatment to be integrated is established. However it is likely these strategies will often need to be addressed once psychosocial, mental health and emotional issues have been targeted. Multiple changes are likely to be required before treatment benefits are obtained, and the multiple changes are linked to a common goal.

### **9.3.2 Maintenance factors for continued reduction/cessation**

An understanding of the factors which contribute to cessation or reduction of CU could enhance maintenance treatment. As the strategies individuals endorsed to achieve cessation/reduction maintenance in our study, were generally similar to those which motivated reduction/cessation focusing on these motivators is key. Incorporating psychosocial (i.e., employment), family interventions and the use of MI and CBT interventions in the maintenance treatment are warranted. It is clear from our findings that these interventions needs to be individualised, targeting the motivators for change. Additionally, treating mental health and emotional difficulties is needed to improve current research trials (Hjorthøj, et al., 2013; Mueser, et al., 2015).

### **9.3.3 Relapse contexts**

As the relapse triggers we identified among CU with psychosis, mirror those identified in the general population, current interventions for relapse are likely to assist in individuals with psychosis. Highlighting the interaction between situational risk factors and individual risk factors in relapse prevention should be a primary focus. Addressing related cognitive deficits in individuals with psychosis may be required to tailor relapse strategies for this group. One could hypothesise that individualised treatment plans incorporating motivators for initial cannabis cessation and maintaining change could be enhanced to reduce relapse risk, however limited research on this topic has been conducted to date, particularly in relation to cannabis and psychosis. Ensuring relatives are involved in relapse planning and able to provide ongoing support is likely to be a useful.

### **9.3.4 Theoretical implications**

Our current results give added weight to the use of current theories and related interventions in the treatment of CU and psychosis. CBT, MI, family intervention and supported employment and education in an integrative approach are integral in current psychosocial theory and intervention. Recent literature on psychosocial theory and intervention for psychosis and SU highlights the integrative role of CBT, MI, family intervention and employment/educational support (Mueser, et al., 2015). An integrative approach is clearly needed given the range of psychosocial components reported in the literature and this research program.

Close connections with people and a stable mental state were associated with SU reduction/cessation in our research (Paper 1); both factors are likely to protect against an increase in psychological distress and the subsequent need to utilise maladaptive coping behaviours (e.g., SU). Other variables found to be associated with SU reduction included having only one substance to address (rather than poly-SUDs), better global functioning and better premorbid social and occupational functioning (Paper 4). It may be that an individual's coping abilities contribute to their more effective management of psychological distress (rather than needing to adopt maladaptive coping behaviours, such as SU). Having private accommodation and receiving an income (Paper 5) potentially increases one's sense of safety and self-esteem in which they can effectively manage psychological distress without the need to use substances. Addressing health, finances and employment, social pressure, mental health problems, dissatisfaction with cannabis, legal issues, relationships and lifestyle (Papers 6 and 7) have been found to aide SU cessation/reduction; this may be due to these reducing the chances of psychological distress and therefore reducing the need to manage this distress through SU. Building on the work of Kellogg and Tatarsky (2012) the above reasons to make a change with regards to SU may be linked with identity theory. Identity theory is a model of multiplicity where individuals are understood to have several identities. Role conflict, as seen in the results of paper 6 and 7, may lead an individual to make changes in their SU as the SU identity does not fit with other identities (identity of a worker). Kellogg and Tatarsky (2012) suggest that identity transformations occur within a social context, which may account for results of paper 5.

Little further insight to improve treatments was provided by our results on reasons for change, effective strategies and relapse triggers. Cognitive deficits, accommodation, income, and multiple drug use may be more important than positive symptoms of psychosis. Targets with multiple impacts maybe necessary (i.e., quality housing away from other substance users). People with poorer prognosis/lack of unassisted recovery may have better prospects of differential treatment effects. As those with better cognitive functioning, reduced polysubstance use, increased personal resources and better living contexts are more likely to self-initiate a reduction/cessation in SU; treatment should focus on those that are less likely to naturally recovery from SU.

In regards to our results on substance relapse, the main findings linked with negative emotional states (including ones from interpersonal conflict), social pressure and trauma. Exploring trauma in people with SMI, Mueser and colleagues (2008) reported that trauma



(Posttraumatic Stress Disorder; PTSD) ranges from 29% to 49% in this population. Given that trauma maybe a risk factor for psychosis and SU, and on the background of our results that suggest it plays a role in relapse, this is an important area of exploration. The study by Mueser and colleagues (2008) compared CBT with treatment as usual (TAU) in assisting people with PTSD and SMI. The results suggest that CBT was effective in reducing PTSD symptoms and negative trauma related cognitions.

In conclusion, there is evidence for the efficacy of various treatment components, there appears significant advantages to an integrative model that allows therapists to draw judiciously on the range of interventions available to them.

## 9.4 STRENGTHS AND LIMITATIONS OF THIS PROJECT

The strengths of the research papers are reported in each of the relevant chapters. This PhD systematically explored the concept of natural recovery from CU in psychosis. Existing research was synthesised and meta-analyses were performed to identify benchmarks for recovery from CU in psychosis for future interventions to be measured against. Baseline predictors of cannabis cessation were identified over 6 and 18 months and qualitative studies exploring natural recovery from cannabis were conducted retrospectively and then prospectively. Throughout this program of research initial motivators for making a change in cannabis use, as well as maintenance strategies and relapse contexts were explored. While the phases had similarities, important differences were found, suggesting that specific individualised interventions at each stage of recovery may be required.

Limitations relating to each study were also outlined in the relevant chapters. Perhaps the most important limitation was the lack of a large mixed methods study, due to the limited timeframe provided by a doctoral degree. Such a study would have provided greater confidence in the generalizability of the results and may have provided greater specificity in the recommendations for future treatment. The qualitative themes may also have been subject to personal bias, interviews were conducted until thematic saturation was reached, and were reviewed by multiple investigators, restricting the extent that such bias may have affected the results. It was clear that a large number of participants did not cease/reduce their use and an understanding of these barriers may be important. Additionally, qualitative assessment with significant others would potentially offer greater insights into motivators, maintenance strategies and relapse contexts.

Other limitations included only having a combined SU variable (Paper 4), not exploring specific change strategies (Paper 4 and 5), inclusion of samples with differing psychiatric diagnoses, and a lack of definition of cessation/reduction (with regards to frequency and timeframes) in Papers 4-7. There were a number of methodological differences between the studies that may have affected the overall results of the research program: for example, using different definitions of SU and of reduction or cessation of use, not specifically operationalising reduction as opposed to cessation, the use of different follow-up durations, and including different durations of change to meet criteria for a reduction or cessation (e.g., Paper 4 vs. 5). These discrepancies rendered it difficult to make comparisons between the studies. These issues were refined through the course of the research project to ensure

consistency in future studies: for example, specifically exploring regular cannabis users, using a one-month time period and using a reduction of 50% of baseline use to achieve reduction (Paper 7).

It is also important to note that Papers 4, 6 and 7 relied on self-reports of SU without verification using urine drug screening. That said, Paper 5 used cannabis immunoassay and gas chromatography/mass spectrometry, and found a high level of agreement between the assays and self-reported CU (Cohen's kappa = 0.90). This result suggests that the self-reports were mostly reliable and supports other research exploring the correlation between self-reported CU and plasma samples in individuals with psychosis (Hjorthøj, Fohlmann, Larsen, Arendt, & Nordentoft, 2012).

Particularly in study 7 eliciting verbal responses was difficult and limited information was obtained despite the use of open ended questions and re-phrasing of the questions in numerous ways. The use of focus groups may assist in the production of greater responses. Additional questions relating to topics such as hopes/dreams and how current difficulties fit with these concepts may assist in richer data.

While a definition of natural recovery has been used in the SU literature for some time, there is a notion that underlies this definition which may account for part of the results and this was not clearly articulate in the above chapters. The assumption is that SU is an episodic illness and those people who entered each study are likely to have been at a difficult period in their SU and as a result “naturally” cycled towards recovery. Therefore the spontaneous reductions found in the series of studies in this thesis may appear as a normal part of this episodic course of the disorder. Consequently, a subgroup of people do reach complete abstinence and no longer experience an episodic course. Understanding prevalence rates of those who recovery and those who continue to experience an episodic course may assist in targeting specific interventions and specific points in an individual's recovery. Across the studies in this research program participants were selected at differing time points in their SU journey. With Study 5, of 67 participants that were using cannabis at baseline 19 participants (28%) did not use cannabis at all over the 6-month follow-up period. In fact, another 26 participants (39%) reduced or ceased their use over the 6-month follow-up period. Future research should aim to better understand at what time point participants are at in their SU cycle and the prevalence of those who cease and reduce their use.

## 9.5 FUTURE DIRECTIONS FOR THIS RESEARCH

This thesis aimed to advance current understanding of the natural recovery from CU among individuals with psychosis. The methodological issues and refinements described in the thesis may guide future research in this area. Future research is required to address methodological issues and expand and replicate the results of the studies included in this research project. A logical step would be to confirm qualitative findings using quantitative designs with larger samples, and extending the work in Paper 7, by conducting a large mixed methods study that focuses on natural recovery from CU by individuals with psychosis - examining motivators for cessation, maintenance factors and relapse contexts. Additional interviews with collateral informants may enhance the findings.

Additional variants to include in future studies are longitudinal studies, as these would allow a greater understanding of recovery over time. Adding a randomised matched control group for comparison in prospective studies on natural recovery and CU would allow a direct comparison of motivators, strategies and contexts for individuals with psychosis compared with the general population, and may further highlight subtle differences between groups, which could then inform interventions. The weight of impact and frequency of strategies and contexts in natural recovery may need to be addressed, as little differences between groups with and without psychosis may continue to be found. There is the possibility that the reasons are differentially weighted, or have different frequencies of use between groups, and this should be explored. Examining naturalistic change over longer time periods consistent with other SU research is also required. This would allow a greater understanding of the course of CU in people with psychosis. Natural recovery studies may need to more thoroughly examine other characteristics of people who naturally recover from CU. For example, factors such as being in a relationship or having fewer diagnoses may be important. Greater clarity could be obtained by studies that include an improved characterisation of participants in terms of symptoms, diagnostic history and degree of SU problems. It may also be important to distinguish between reasons for controlling different substances or substance combinations (e.g., cannabis and alcohol or cannabis and amphetamines) given the high prevalence of poly SU. Paper 7 provides clear guidance on the measurement of such variables, which should be followed in future research to allow direct comparisons. Directly exploring the results of the current research may assist in understanding the exact reason for change as a number of the results are open to multiple interpretations (i.e., living in private accommodation).

Across each paper in this research project, participants were involved in a number of concurrent treatments, including antipsychotic medication and case management. To improve the naturalistic context of the research and provide more ‘pure’ data on natural recovery, future studies should attempt to explore the topic with less intensively treated samples. Wider collection of participants who are not linked in with mental health services, using newspaper or internet advertisements may provide such an avenue.

Based on the findings of this research project, we have recommended a number of suggestions for the refinement of current treatment approaches for ceasing or reducing CU among people with psychosis. Additionally we have advocated for an integrative approach, namely schema therapy, in addressing SU (and psychosis). Once such treatments have been developed and implemented, assessing the viability and outcome is required (e.g., through pilot studies, RCTs). An area which requires in-depth assessment and review is that of emotional connection and healing. Such research could use a schema therapy approach and initially assess underlying life patterns using the Young Schema Questionnaire (Young, 2003).

Results from Paper 3 should be used to estimate likely differential effects of future treatment interventions and required sample sizes for treatment trials. By using the benchmark of a mean reduction of 0.4 SD, interventions would require improvements beyond this to be worthy of ongoing exploration. Finally, a second systematic literature review should be conducted; it is recommended that this review includes research published since our review in August 2014 – including our published research that is presented in Papers 6 and 7. A second review would allow an updated synthesis of the literature on natural recovery from CU in people with psychosis. Summarising and exploring limitations to these studies may identify directions for future research and assist in developing treatments that show more consistent and sustained benefits over control conditions. Further comparisons could also be made with result from systematic reviews in the general population. Knowledge gained from such research could lead to the development of conceptual models of recovery for a CU and psychosis population.

## **9.6 FINAL COMMENT**

There has been a dearth of research on effective interventions for CU in psychosis, despite the adverse consequences of CU in this population. This research program

endeavoured to improve CU treatment by conducting a series of studies on natural recovery from CU among individuals with psychosis. A range of factors that can assist in the cessation/reduction, maintenance and relapse of CU were identified. Future research is required to replicate these findings in larger sample of cannabis users with psychosis over time, and incorporate these results into the development of new integrated treatments for CU in psychosis.

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# Appendices

## Appendix A

Days of cannabis or other substance use in the past 30 days, in control groups of substance use treatment trials in psychotic samples at baseline and follow up

	<i>Substance</i>	<i>Baseline</i>			<i>6 months</i>			<i>10-12 months</i>			<i>24 months</i>		
		<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Drake et al., 1998 <sup>1</sup>	S	40	12.5	8.7	40	7.6	8.2	40	7.9	9.1	40	6.3	8.1
Edwards et al., 2006 <sup>2</sup>	C	24	7.8	8.5	24	5.6	9.2						
Essock et al., 2006 <sup>1</sup>	S	99	8.1	9.5	99	6.8	9.4	99	5.8	8.4	99	6.8	8.8
Morse et al., 2006 <sup>3</sup>	S/C	49	3.2	3.2	49	2.1	2.5	49	2.5	2.7	49	2.1	2.6
Barrowclough et al., 2010 <sup>4</sup>	S/C	163	21.9	8.2	148	18.1	11.5	137	17.6	11.2	117	15.4	11.9
Morrens et al., 2011	S/C	35	5.5	2.1	10	4.3	2.9	7	4.8	2.6			
Smeerdijk et al., 2012 <sup>3</sup>	C	27	17.6	10.7				20	13.4	11.0			
Madigan et al., 2013	C	29	10.1	3.6				14	10.1	4.0			
<b>Weighted means</b>													
	Studies to 6 months		13.2			10.6							
	Studies to 10-12 months		13.5					10.6					
	Studies to 24 months		14.3								9.3		

Conversion formulae from reported means (M) to give days of use in the past 30 days: (1) Days used in past 6 months:  $M/6$ ; (2) % days used in past 4 weeks:  $M \times 30$ ; (3) Days used in past 90:  $M/3$ ; (4) Proportion of days abstinent from main substance in past 90:  $(1-M)*30$ .

**Appendix B**

**Demographic Information**

Participant #: \_\_\_\_\_

**Date of Interview:** \_\_\_\_\_

**Gender (circle):** Male Female

**Age:** \_\_\_\_\_ years

**Education:** What grade did you finish at school? \_\_\_\_\_ years

Did you finish any studies after school? Trade \_\_\_\_\_ years PT

Diploma/certificate \_\_\_\_\_ years FT/PT

University degree/s \_\_\_\_\_ years FT/PT

Other : \_\_\_\_\_ years FT/PT

Total \_\_\_\_\_ years FTE

**Employment (can check > 1):**

Unemployed/benefits

Student

Employed PT/FT as \_\_\_\_\_

**Current relationship:**

Never married

Separated/divorced/widowed

Partnered/married

**How would you describe your background?**

Australian Born, Non-Aboriginal

Australian Born, Aboriginal or TSI

Born in \_\_\_\_\_

**Who do you live with?**

No one—live alone

With partner

Share accommodation

Hostel/boarding house

With parents

**Current Diagnosis:** \_\_\_\_\_

**Have you ever been in hospital for a mental health problem?**

No

Yes –How many times? \_\_\_\_\_

**What medication/s are you on now?** \_\_\_\_\_

\_\_\_\_\_

**Has anyone else in your family had mental health difficulties?** (Including aunts, uncles, cousins...?)

No

Yes --Who? \_\_\_\_\_ What was the problem? \_\_\_\_\_

Anyone else? \_\_\_\_\_ What was the problem? \_\_\_\_\_

**Have you ever had treatment for cannabis use?** No Yes --When? \_\_\_\_\_

What was the treatment?

\_\_\_\_\_

**Timeline Questions:**

To help us learn about your drug and alcohol use, we would like you to help us fill out this timeline.

- We understand you won't remember everything. That's OKAY.

Can you tell me when you started:

- Drinking alcohol
- Smoking Cannabis
- Using other drugs (including amphetamines, hallucinogens, inhalants, prescription medication)

Can you tell me when you started using cannabis every day?

(If never, get time for "most days")

Can you tell me about any times you had more cannabis than usual?

- Were there any other times you had more cannabis than usual?
- Was there any change in your drinking or other drug use then?

Can you tell me about any times you had less cannabis than usual?

- Were there any other times you had less cannabis than usual?
- Was there any change in your drinking or other drug use then?

Can you tell me about any times you stopped using cannabis for a month or more?

- Were there any other times you stopped using cannabis for a month or more?
- Was there any change in your drinking or other drug use then?

Can you tell me when you were first diagnosed with a mental illness?

Can you tell me when you were in hospital for a mental illness?

- Was there any change in your drinking or other drug use then?
- Were there any other times you were in hospital for a mental illness?

## Qualitative Questions:

*If there is a previous attempt to stop/reduce use (ask the following)*

1. Tell me about the last time you stopped using cannabis.  
(if none: ...when you cut down cannabis use).  
What was happening around then?  
(If it was just a lack of supply, look for another time).  
(Was anything else happening then?)  
Why did you stop using it that time?  
(Were there any other reasons you stopped using it then?)
2. When you weren't using cannabis (point to timeline), were there times when that was hard?
  - a. Tell me more about that...
  - b. How did you stay in control?
  - c. Any other times you found it hard to stop using? (repeat questions).
3. (If went back to using):  
What was happening when you went back to using cannabis?  
(Was anything else happening then?)  
Why did you go back to using it?  
(Were there any other reasons you went back to using it?)
  - a. Tell me more about that...

(If there was a previous time the person stopped using cannabis, ask the same questions about that one)

Tell me about the previous time you stopped using cannabis.

(if none: ...when you cut down cannabis use).



# Timeline

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

**Age**

## Appendix C

### Demographic Information

Participant #: \_\_\_\_\_

Date of Interview: \_\_\_\_\_

Gender (circle):      Male      Female

Age: \_\_\_\_\_ years

Education:      What grade did you finish at school? \_\_\_\_\_ years

Did you finish any studies after school?      Trade      \_\_\_\_\_ years PT

Diploma/certificate \_\_\_\_\_ years FT/PT

University degree/s \_\_\_\_\_ years FT/PT

Other : \_\_\_\_\_ years FT/PT

Total      \_\_\_\_\_ years FTE

Employment (can check > 1):

Unemployed/benefits

Student

Employed PT/FT as \_\_\_\_\_

Current relationship:

Never married

Separated/divorced/widowed

Partnered/married

How would you describe your background?

Australian Born, Non-Aboriginal

Australian Born, Aboriginal or TSI

Born in \_\_\_\_\_

**Who do you live with?**

No one—live alone

With partner

Share accommodation

Hostel/boarding house

With parents

**Current Diagnosis:** \_\_\_\_\_

**Have you ever been in hospital for a mental health problem?**

No

Yes --How many times? \_\_\_\_\_

**What medication/s are you on now?** \_\_\_\_\_

\_\_\_\_\_

**Has anyone else in your family had mental health difficulties?** (Including aunts, uncles, cousins...?)

No

Yes --Who? \_\_\_\_\_ What was the problem? \_\_\_\_\_

Anyone else? \_\_\_\_\_ What was the problem? \_\_\_\_\_

**Have you ever had treatment for cannabis use?** No Yes --When? \_\_\_\_\_

What was the treatment? \_\_\_\_\_

## Qualitative Questions:

*If there is a reduction/cessation in cannabis (ask the following)*

1. Tell me about when you stopped/cut down using cannabis.
  - What was happening around then?  
(Was anything else happening then?)
  - Why did you stop/cut down using it that time?  
(Were there any other reasons you stopped/cut down using it then?)
  - Did you use any other alcohol or drugs more during this time?
  
2. When you weren't using as much cannabis, were there times when this was hard?
  - a. Tell me more about that...
  - b. How did you stay in control?
  - c. Any other times you found it hard? (repeat questions).
  
3. (If went back to using or increased use):
  - What was happening when you went back to using/ increased your cannabis?  
(Was anything else happening then?)
  - Why did you go back to using/increase it?  
(Were there any other reasons you went back to using/increase it?)
  - a. Tell me more about that...

# Brief Psychiatric Rating Scale (BPRS)

## Expanded Version (4.0)

### Introduction

This section reproduces an interview schedule, symptom definitions, and specific anchor points for rating symptoms on the BPRS. Clinicians intending to use the BPRS should also consult the detailed guidelines for administration contained in the reference below.

### Scale Items and Anchor Points

Rate items 1-14 on the basis of individual's self-report. Note items 7, 12 and 13 are also rated on the basis of observed behaviour. Items 15-24 are rated on the basis of observed behaviour and speech.

#### 1. Somatic Concern

Degree of concern over present bodily health. Rate the degree to which physical health is perceived as a problem by the individual, whether complaints have realistic bases or not. Somatic delusions should be rated in the severe range with or without somatic concern. Note: be sure to assess the degree of impairment due to somatic concerns only and not other symptoms, e.g., depression. In addition, if the individual rates 6 or 7 due to somatic delusions, then you must rate Unusual Thought Content at least 4 or above.

**2 Very mild** Occasional somatic concerns that tend to be kept to self.

**3 Mild** Occasional somatic concerns that tend to be voiced to others (e.g., family, doctor).

**4 Moderate** Frequent expressions of somatic concern or exaggerations of existing ills OR some preoccupation, but no impairment in functioning. Not delusional.

**5 Moderately severe** Frequent expressions of somatic concern or exaggerations of existing ills OR some preoccupation and moderate impairment of functioning. Not delusional.

**6 Severe** Preoccupation with somatic complaints with much impairment in functioning OR somatic delusions without acting on them or disclosing to others.

**7 Extremely severe** Preoccupation with somatic complaints with severe impairment in functioning OR somatic delusions that tend to be acted on or disclosed to others.

"Have you been concerned about your physical health?" "Have you had any physical illness or seen a medical doctor lately? (What does your doctor say is wrong? How serious is it?)"

"Has anything changed regarding your appearance?"

"Has it interfered with your ability to perform your usual activities and/or work?"

"Did you ever feel that parts of your body had changed or stopped working?"

[If individual reports any somatic concerns/delusions, ask the following]:

"How often are you concerned about [use individual's description]?"

"Have you expressed any of these concerns to others?"

#### 2. Anxiety

Reported apprehension, tension, fear, panic or worry. Rate only the individual's statements - not observed anxiety which is rated under Tension.

**2 Very mild** Reports some discomfort due to worry OR infrequent worries that occur more than usual for most normal individuals.

**3 Mild** Worried frequently but can readily turn attention to other things.

**4 Moderate** Worried most of the time and cannot turn attention to other things easily but no impairment in functioning OR occasional anxiety with autonomic accompaniment but no impairment in functioning.

**5 Moderately Severe** Frequent, but not daily, periods of anxiety with autonomic accompaniment OR some areas of functioning are disrupted by anxiety or worry.

**6 Severe** Anxiety with autonomic accompaniment daily but not persisting throughout the day OR many areas of functioning are disrupted by anxiety or constant worry.

**7 Extremely Severe** Anxiety with autonomic accompaniment persisting throughout the day OR most areas of functioning are disrupted by anxiety or constant worry.

"Have you been worried a lot during [mention time frame]? Have you been nervous or apprehensive? (What do you worry about?)"

"Are you concerned about anything? How about finances or the future?"

"When you are feeling nervous, do your palms sweat or does your heart beat fast (or shortness of breath, trembling, choking)?"

[If individual reports anxiety or autonomic accompaniment, ask the following]:

"How much of the time have you been [use individual's description]?"

"Has it interfered with your ability to perform your usual activities/work?"

### 3. Depression

Include sadness, unhappiness, anhedonia and preoccupation with depressing topics (can't attend to TV or conversations due to depression), hopeless, loss of self-esteem (dissatisfied or disgusted with self or feelings of worthlessness). Do not include vegetative symptoms, e.g., motor retardation, early waking or the amotivation that accompanies the deficit syndrome.

**2 Very mild** Occasionally feels sad, unhappy or depressed.

**3 Mild** Frequently feels sad or unhappy but can readily turn attention to other things.

**4 Moderate** Frequent periods of feeling very sad, unhappy, moderately depressed, but able to function with extra effort.

**5 Moderately Severe** Frequent, but not daily, periods of deep depression OR some areas of functioning are disrupted by depression.

**6 Severe** Deeply depressed daily but not persisting throughout the day OR many areas of functioning are disrupted by depression.

**7 Extremely Severe** Deeply depressed daily OR most areas of functioning are disrupted by depression.

"How has your mood been recently? Have you felt depressed (sad, down, unhappy, as if you didn't care)?"

"Are you able to switch your attention to more pleasant topics when you want to?"

"Do you find that you have lost interest in or get less pleasure from things you used to enjoy, like family, friends, hobbies, watching TV, eating?"

[If individual reports feelings of depression, ask the following]:

"How long do these feelings last?" "Has it interfered with your ability to perform your usual activities?"

### 4. Suicidality

Expressed desire, intent, or actions to harm or kill self.

**2 Very mild** Occasional feelings of being tired of living. No overt suicidal thoughts.

**3 Mild** Occasional suicidal thoughts without intent or specific plan OR he/she feels they would be better off dead.

**4 Moderate** Suicidal thoughts frequent without intent or plan.

**5 Moderately Severe** Many fantasies of suicide by various methods. May seriously consider making an attempt with specific time and plan OR impulsive suicide attempt using non-lethal method or in full view of potential saviours.

**6 Severe** Clearly wants to kill self. Searches for appropriate means and time, OR potentially serious suicide attempt with individual knowledge of possible rescue.

**7 Extremely Severe** Specific suicidal plan and intent (e.g., "as soon as \_\_\_\_\_ I will do it by doing X"), OR suicide attempt characterised by plan individual thought was lethal or attempt in secluded environment.

"Have you felt that life wasn't worth living? Have you thought about harming or killing yourself? Have you felt tired of living or as though you would be better off dead? Have you ever felt like ending it all?"

[If individual reports suicidal ideation, ask the following]:

"How often have you thought about [use individual's description]?"

"Did you (Do you) have a specific plan?"

## 5. Guilt

Overconcern or remorse for past behaviour. Rate only individual's statements, do not infer guilt feelings from depression, anxiety, or neurotic defences. Note: if the individual rates 6 or 7 due to delusions of guilt, then you must rate Unusual Thought Content at least 4 or above, depending on level of preoccupation and impairment.

**2 Very mild** Concerned about having failed someone, or at something, but not preoccupied. Can shift thoughts to other matters easily.

**3 Mild** Concerned about having failed someone, or at something, with some preoccupation. Tends to voice guilt to others.

**4 Moderate** Disproportionate preoccupation with guilt, having done wrong, injured others by doing or failing to do something, but can readily turn attention to other things.

**5 Moderately Severe** Preoccupation with guilt, having failed someone or at something, can turn attention to other things, but only with great effort. Not delusional.

**6 Severe** Delusional guilt OR unreasonable self-reproach very out of proportion to circumstances. Moderate preoccupation present.

**7 Extremely Severe** Delusional guilt OR unreasonable self-reproach grossly out of proportion to circumstances. Individual is very preoccupied with guilt and is likely to disclose to others or act on delusions.

"Is there anything you feel guilty about? Have you been thinking about past problems?"

"Do you tend to blame yourself for things that have happened?"

"Have you done anything you're still ashamed of?"

[If individual reports guilt/remorse/delusions, ask the following]:

"How often have you been thinking about [use individual's description]?"

"Have you disclosed your feelings of guilt to others?"

## 6. Hostility

Animosity, contempt, belligerence, threats, arguments, tantrums, property destruction, fights, and any other expression of hostile attitudes or actions. Do not infer hostility from neurotic defences, anxiety or somatic complaints. Do not include incidents of appropriate anger or obvious self-defence.

**2 Very mild** Irritable or grumpy, but not overtly expressed.

**3 Mild** Argumentative or sarcastic.

- 4 Moderate** Overtly angry on several occasions OR yelled at others excessively.
- 5 Moderately Severe** Has threatened, slammed about or thrown things.
- 6 Severe** Has assaulted others but with no harm likely, e.g., slapped or pushed, OR destroyed property, e.g., knocked over furniture, broken windows.
- 7 Extremely Severe** Has attacked others with definite possibility of harming them or with actual harm, e.g., assault with hammer or weapon.

"How have you been getting along with people (family, co-workers, etc.)?"

"Have you been irritable or grumpy lately? (How do you show it? Do you keep it to yourself?"

"Were you ever so irritable that you would shout at people or start fights or arguments? (Have you found yourself yelling at people you didn't know?)"

"Have you hit anyone recently?"

## 7. Elevated Mood

A pervasive, sustained and exaggerated feeling of well-being, cheerfulness, euphoria (implying a pathological mood), optimism that is out of proportion to the circumstances. Do not infer elation from increased activity or from grandiose statements alone.

**2 Very mild** Seems to be very happy, cheerful without much reason.

**3 Mild** Some unaccountable feelings of well-being that persist.

**4 Moderate** Reports excessive or unrealistic feelings of well-being, cheerfulness, confidence or optimism inappropriate to circumstances, some of the time. May frequently joke, smile, be giddy, or overly enthusiastic OR few instances of marked elevated mood with euphoria.

**5 Moderately Severe** Reports excessive or unrealistic feelings of well-being, confidence or optimism inappropriate to circumstances, much of the time. May describe feeling 'on top of the world', 'like everything is falling into place', or 'better than ever before', OR several instances of marked elevated mood with euphoria.

**6 Severe** Reports many instances of marked elevated mood with euphoria OR mood definitely elevated almost constantly throughout interview and inappropriate to content.

**7 Extremely Severe** Individual reports being elated or appears almost intoxicated, laughing, joking, giggling, constantly euphoric, feeling invulnerable, all inappropriate to immediate circumstances.

"Have you felt so good or high that other people thought that you were not your normal self?" "Have you been feeling cheerful and 'on top of the world' without any reason?"

[If individual reports elevated mood/euphoria, ask the following]:

"Did it seem like more than just feeling good?"

"How long did that last?"

## 8. Grandiosity

Exaggerated self-opinion, self-enhancing conviction of special abilities or powers or identity as someone rich or famous. Rate only individual's statements about himself, not his/her demeanour. Note: if the individual rates 6 or 7 due to grandiose delusions, you must rate Unusual Thought Content at least 4 or above.

**2 Very mild** Feels great and denies obvious problems, but not unrealistic.

**3 Mild** Exaggerated self-opinion beyond abilities and training.

**4 Moderate** Inappropriate boastfulness, e.g., claims to be brilliant, insightful or gifted beyond realistic proportions, but rarely self-discloses or acts on these inflated selfconcepts.



Does not claim that grandiose accomplishments have actually occurred.

**5 Moderately Severe** Same as 4 but often self-discloses and acts on these grandiose ideas. May have doubts about the reality of the grandiose ideas. Not delusional.

**6 Severe** Delusional - claims to have special powers like ESP, to have millions of dollars, invented new machines, worked at jobs when it is known that he/she was never employed in these capacities, be Jesus Christ, or the Prime Minister. Individual may not be very preoccupied.

**7 Extremely Severe** Delusional - same as 6 but individual seems very preoccupied and tends to disclose or act on grandiose delusions.

"Is there anything special about you? Do you have any special abilities or powers? Have you thought that you might be somebody rich or famous?"

[If the individual reports any grandiose ideas/delusions, ask the following]:

"How often have you been thinking about [use individual's description]? Have you told anyone about what you have been thinking? Have you acted on any of these ideas?"

## 9. Suspiciousness

Expressed or apparent belief that other persons have acted maliciously or with discriminatory intent. Include persecution by supernatural or other non-human agencies (e.g., the devil). Note: ratings of 3 or above should also be rated under Unusual Thought Content.

**2 Very mild** Seems on guard. Reluctant to respond to some 'personal' questions. Reports being overly self-conscious in public.

**3 Mild** Describes incidents in which others have harmed or wanted to harm him/her that sound plausible. Individual feels as if others are watching, laughing or criticising him/her in public, but this occurs only occasionally or rarely. Little or no preoccupation.

**4 Moderate** Says other persons are talking about him/her maliciously, have negative intentions or may harm him/her. Beyond the likelihood of plausibility, but not delusional. Incidents of suspected persecution occur occasionally (less than once per week) with some preoccupation.

**5 Moderately Severe** Same as 4, but incidents occur frequently, such as more than once per week. Individual is moderately preoccupied with ideas of persecution OR individual reports persecutory delusions expressed with much doubt (e.g., partial delusion).

**6 Severe** Delusional - speaks of Mafia plots, the FBI or others poisoning his/her food, persecution by supernatural forces.

**7 Extremely Severe** Same as 6, but the beliefs are bizarre or more preoccupying. Individual tends to disclose or act on persecutory delusions.

"Do you ever feel uncomfortable in public? Does it seem as though others are watching you? Are you concerned about anyone's intentions toward you? Is anyone going out of their way to give you a hard time, or trying to hurt you? Do you feel in any danger?"

[If individual reports any persecutory ideas/delusions, ask the following]:

"How often have you been concerned that [use individual's description]? Have you told anyone about these experiences?"

## 10. Hallucinations

Reports of perceptual experiences in the absence of relevant external stimuli. When rating degree to which functioning is disrupted by hallucinations, include preoccupation with the content and experience of the hallucinations, as well as functioning disrupted by acting out on the hallucinatory content (e.g., engaging in deviant behaviour due to

command hallucinations). Include thoughts aloud ('gedenkenlautwerden') or pseudohallucinations (e.g., hears a voice inside head) if a voice quality is present.

**2 Very mild** While resting or going to sleep, sees visions, smells odours or hears voices, sounds, or whispers in the absence of external stimulation, but no impairment in functioning.

**3 Mild** While in a clear state of consciousness, hears a voice calling the individual's name, experiences non-verbal auditory hallucinations (e.g., sounds or whispers), formless visual hallucinations or has sensory experiences in the presence of a modalityrelevant stimulus (e.g., visual illusions) infrequently (e.g., 1-2 times per week) and with no functional impairment.

**4 Moderate** Occasional verbal, visual, gustatory, olfactory or tactile hallucinations with no functional impairment OR non-verbal auditory hallucinations/visual illusions more than infrequently or with impairment.

**5 Moderately Severe** Experiences daily hallucinations OR some areas of functioning are disrupted by hallucinations.

**6 Severe** Experiences verbal or visual hallucinations several times a day OR many areas of functioning are disrupted by these hallucinations.

**7 Extremely Severe** Persistent verbal or visual hallucinations throughout the day OR most areas of functioning are disrupted by these hallucinations.

"Do you ever seem to hear your name being called?"

"Have you heard any sounds or people talking to you or about you when there has been nobody around?"

[If hears voices]:

"What does the voice/voices say? Did it have a voice quality?"

"Do you ever have visions or see things that others do not see? What about smell odours that others do not smell?"

[If the individual reports hallucinations, ask the following]:

"Have these experiences interfered with your ability to perform your usual activities/work? How do you explain them? How often do they occur?"

## **11. Unusual thought content**

Unusual, odd, strange, or bizarre thought content. Rate the degree of unusualness, not the degree of disorganisation of speech. Delusions are patently absurd, clearly false or bizarre ideas that are expressed with full conviction. Consider the individual to have full conviction if he/she has acted as though the delusional belief was true. Ideas of reference/persecution can be differentiated from delusions in that ideas are expressed with much doubt and contain more elements of reality. Include thought insertion, withdrawal and broadcast. Include grandiose, somatic and persecutory delusions even if rated elsewhere. Note: if Somatic Concern, Guilt, Suspiciousness or Grandiosity are rated 6 or 7 due to delusions, then Unusual Thought Content must be rated 4 or above.

**2 Very mild** Ideas of reference (people may stare or may laugh at him), ideas of persecution (people may mistreat him). Unusual beliefs in psychic powers, spirits, UFOs, or unrealistic beliefs in one's own abilities. Not strongly held. Some doubt.

**3 Mild** Same as 2, but degree of reality distortion is more severe as indicated by highly unusual ideas or greater conviction. Content may be typical of delusions (even bizarre), but without full conviction. The delusion does not seem to have fully formed, but is considered as one possible explanation for an unusual experience.

**4 Moderate** Delusion present but no preoccupation or functional impairment. May be an encapsulated delusion or a firmly endorsed absurd belief about past delusional

circumstances.

**5 Moderately Severe** Full delusion(s) present with some preoccupation OR some areas of functioning disrupted by delusional thinking.

**6 Severe** Full delusion(s) present with much preoccupation OR many areas of functioning are disrupted by delusional thinking.

**7 Extremely Severe** Full delusion(s) present with almost total preoccupation OR most areas of functioning disrupted by delusional thinking.

"Have you been receiving any special messages from people or from the way things are arranged around you? Have you seen any references to yourself on TV or in the newspapers?"

"Can anyone read your mind?"

"Do you have a special relationship with God?"

"Is anything like electricity, X-rays, or radio waves affecting you?"

"Are thoughts put into your head that are not your own?"

"Have you felt that you were under the control of another person or force?"

[If individual reports any odd ideas/delusions, ask the following]:

"How often do you think about [use individual's description]?"

"Have you told anyone about these experiences? How do you explain the things that have been happening [specify]?"

Rate items 12-13 on the basis of individual's self-report and observed behaviour.

## 12. Bizarre behaviour

Reports of behaviours which are odd, unusual, or psychotically criminal. Not limited to interview period. Include inappropriate sexual behaviour and inappropriate affect.

**2 Very mild** Slightly odd or eccentric public behaviour, e.g., occasionally giggles to self, fails to make appropriate eye contact, that does not seem to attract the attention of others OR unusual behaviour conducted in private, e.g., innocuous rituals, that would not attract the attention of others.

**3 Mild** Noticeably peculiar public behaviour, e.g., inappropriately loud talking, makes inappropriate eye contact, OR private behaviour that occasionally, but not always, attracts the attention of others, e.g., hoards food, conducts unusual rituals, wears gloves indoors.

**4 Moderate** Clearly bizarre behaviour that attracts or would attract (if done privately) the attention or concern of others, but with no corrective intervention necessary. Behaviour occurs occasionally, e.g., fixated staring into space for several minutes, talks back to voices once, inappropriate giggling/laughter on 1-2 occasions, talking loudly to self.

**5 Moderately Severe** Clearly bizarre behaviour that attracts or would attract (if done privately) the attention of others or the authorities, e.g., fixated staring in a socially disruptive way, frequent inappropriate giggling/laughter, occasionally responds to voices, or eats non-foods.

**6 Severe** Bizarre behaviour that attracts attention of others and intervention by authorities, e.g., directing traffic, public nudity, staring into space for long periods, carrying on a conversation with hallucinations, frequent inappropriate giggling/laughter.

**7 Extremely Severe** Serious crimes committed in a bizarre way that attract the attention of others and the control of authorities, e.g., sets fires and stares at flames OR almost constant bizarre behaviour, e.g., inappropriate giggling/laughter, responds only to hallucinations and cannot be engaged in interaction.

"Have you done anything that has attracted the attention of others?"

"Have you done anything that could have gotten you into trouble with the police?"

"Have you done anything that seemed unusual or disturbing to others?"

### 13. Self-neglect

Hygiene, appearance, or eating behaviour below usual expectations, below socially acceptable standards or life threatening.

**2 Very mild** Hygiene/appearance slightly below usual community standards, e.g., shirt out of pants, buttons unbuttoned, shoe laces untied, but no social or medical consequences.

**3 Mild** Hygiene/appearance occasionally below usual community standards, e.g., irregular bathing, clothing is stained, hair uncombed, occasionally skips an important meal. No social or medical consequences.

**4 Moderate** Hygiene/appearance is noticeably below usual community standards, e.g., fails to bathe or change clothes, clothing very soiled, hair unkempt, needs prompting, noticeable by others OR irregular eating and drinking with minimal medical concerns and consequences.

**5 Moderately Severe** Several areas of hygiene/appearance are below usual community standards OR poor grooming draws criticism by others and requires regular prompting. Eating or hydration are irregular and poor, causing some medical problems.

**6 Severe** Many areas of hygiene/appearance are below usual community standards, does not always bathe or change clothes even if prompted. Poor grooming has caused social ostracism at school/residence/work, or required intervention. Eating erratic and poor, may require medical intervention.

**7 Extremely Severe** Most areas of hygiene/appearance/nutrition are extremely poor and easily noticed as below usual community standards OR hygiene/appearance/nutrition require urgent and immediate medical intervention.

"How has your grooming been lately? How often do you change your clothes? How often do you take showers? Has anyone (parents/staff) complained about your grooming or dress? Do you eat regular meals?"

### 14. Disorientation

Does not comprehend situations or communications, such as questions asked during the entire BPRS interview. Confusion regarding person, place, or time. Do not rate if incorrect responses are due to delusions.

**2 Very mild** Seems muddled or mildly confused 1-2 times during interview. Oriented to person, place and time.

**3 Mild** Occasionally muddled or mildly confused 3-4 times during interview. Minor inaccuracies in person, place, or time, e.g., date off by more than 2 days, or gives wrong division of hospital or community centre.

**4 Moderate** Frequently confused during interview. Minor inaccuracies in person, place, or time are noted, as in 3 above. In addition, may have difficulty remembering general information, e.g., name of Prime Minister.

**5 Moderately Severe** Markedly confused during interview, or to person, place, or time. Significant inaccuracies are noted, e.g., date off by more than one week, or cannot give correct name of hospital. Has difficulty remembering personal information, e.g., where he/she was born or recognising familiar people.

**6 Severe** Disoriented as to person, place, or time, e.g., cannot give correct month and year. Disoriented in 2 out of 3 spheres.

**7 Extremely Severe** Grossly disoriented as to person, place, or time, e.g., cannot give name or age. Disoriented in all three spheres.

"May I ask you some standard questions we ask everybody?"

"How old are you? What is the date [allow 2 days]"

"What is this place called? What year were you born? Who is the Prime Minister?"

Rate items 15-24 on the basis of observed behaviour and speech.

### 15 Conceptual disorganisation

Degree to which speech is confused, disconnected, vague or disorganised. Rate tangentiality, circumstantiality, sudden topic shifts, incoherence, derailment, blocking, neologisms, and other speech disorders. Do not rate content of speech.

**2 Very mild** Peculiar use of words or rambling but speech is comprehensible.

**3 Mild** Speech a bit hard to understand or make sense of due to tangentiality, circumstantiality, or sudden topic shifts.

**4 Moderate** Speech difficult to understand due to tangentiality, circumstantiality, idiosyncratic speech, or topic shifts on many occasions OR 1-2 instances of incoherent phrases.

**5 Moderately Severe** Speech difficult to understand due to circumstantiality, tangentiality, neologisms, blocking or topic shifts most of the time, OR 3-5 instances of incoherent phrases.

**6 Severe** Speech is incomprehensible due to severe impairment most of the time. Many BPRS items cannot be rated by self-report alone.

**7 Extremely Severe** Speech is incomprehensible throughout interview.

### 16. Blunted affect

Restricted range in emotional expressiveness of face, voice, and gestures. Marked indifference or flatness even when discussing distressing topics. In the case of euphoric or dysphoric individuals, rate Blunted Affect if a flat quality is also clearly present.

**2 Very mild** Emotional range is slightly subdued or reserved but displays appropriate facial expressions and tone of voice that are within normal limits.

**3 Mild** Emotional range overall is diminished, subdued or reserved, without many spontaneous and appropriate emotional responses. Voice tone is slightly monotonous.

**4 Moderate** Emotional range is noticeably diminished, individual doesn't show emotion, smile or react to distressing topics except infrequently. Voice tone is monotonous or there is noticeable decrease in spontaneous movements. Displays of emotion or gestures are usually followed by a return to flattened affect.

**5 Moderately Severe** Emotional range very diminished, individual doesn't show emotion, smile, or react to distressing topics except minimally, few gestures, facial expression does not change very often. Voice tone is monotonous much of the time.

**6 Severe** Very little emotional range or expression. Mechanical in speech and gestures most of the time. Unchanging facial expression. Voice tone is monotonous most of the time.

**7 Extremely Severe** Virtually no emotional range or expressiveness, stiff movements. Voice tone is monotonous all of the time.

Use the following probes at end of interview to assess emotional responsivity:

"Have you heard any good jokes lately? Would you like to hear a joke?"

### 17. Emotional withdrawal

Deficiency in individual's ability to relate emotionally during interview situation. Use your own feeling as to the presence of an 'invisible barrier' between individual and

interviewer. Include withdrawal apparently due to psychotic processes.

**2 Very mild** Lack of emotional involvement shown by occasional failure to make reciprocal comments, appearing preoccupied, or smiling in a stilted manner, but spontaneously engages the interviewer most of the time.

**3 Mild** Lack of emotional involvement shown by noticeable failure to make reciprocal comments, appearing preoccupied, or lacking in warmth, but responds to interviewer when approached.

**4 Moderate** Emotional contact not present much of the interview because individual does not elaborate responses, fails to make eye contact, doesn't seem to care if interviewer is listening, or may be preoccupied with psychotic material.

**5 Moderately Severe** Same as 4 but emotional contact not present most of the interview.

**6 Severe** Actively avoids emotional participation. Frequently unresponsive or responds with yes/no answers (not solely due to persecutory delusions). Responds with only minimal affect.

**7 Extremely Severe** Consistently avoids emotional participation. Unresponsive or responds with yes/no answers (not solely due to persecutory delusions). May leave during interview or just not respond at all.

## 18. Motor retardation

Reduction in energy level evidenced by slowed movements and speech, reduced body tone, decreased number of spontaneous body movements. Rate on the basis of observed behaviour of the individual only. Do not rate on the basis of individual's subjective impression of his own energy level. Rate regardless of medication effects.

**2 Very mild** Slightly slowed or reduced movements or speech compared to most people.

**3 Mild** Noticeably slowed or reduced movements or speech compared to most people.

**4 Moderate** Large reduction or slowness in movements or speech.

**5 Moderately Severe** Seldom moves or speaks spontaneously OR very mechanical or stiff movements

**6 Severe** Does not move or speak unless prodded or urged.

**7 Extremely Severe** Frozen, catatonic.

## 19. Tension

Observable physical and motor manifestations of tension, 'nervousness' and agitation. Self-reported experiences of tension should be rated under the item on anxiety. Do not rate if restlessness is solely akathisia, but do rate if akathisia is exacerbated by tension.

**2 Very mild** More fidgety than most but within normal range. A few transient signs of tension, e.g., picking at fingernails, foot wagging, scratching scalp several times or finger tapping.

**3 Mild** Same as 2, but with more frequent or exaggerated signs of tension.

**4 Moderate** Many and frequent signs of motor tension with one or more signs sometimes occurring simultaneously, e.g., wagging one's foot while wringing hands together. There are times when no signs of tension are present.

**5 Moderately Severe** Many and frequent signs of motor tension with one or more signs often occurring simultaneously. There are still rare times when no signs of tension are present.

**6 Severe** Same as 5, but signs of tension are continuous.

**7 Extremely Severe** Multiple motor manifestations of tension are continuously present, e.g., continuous pacing and hand wringing.

## 20. Unco-operativeness

Resistance and lack of willingness to co-operate with the interview. The uncooperativeness might result from suspiciousness. Rate only unco-operativeness in relation to the interview, not behaviours involving peers and relatives.

**2 Very mild** Shows non-verbal signs of reluctance, but does not complain or argue.

**3 Mild** Gripes or tries to avoid complying, but goes ahead without argument.

**4 Moderate** Verbally resists but eventually complies after questions are rephrased or repeated.

**5 Moderately Severe** Same as 4, but some information necessary for accurate ratings is withheld.

**6 Severe** Refuses to co-operate with interview, but remains in interview situation.

**7 Extremely Severe** Same as 6, with active efforts to escape the interview

## 21. Excitement

Heightened emotional tone or increased emotional reactivity to interviewer or topics being discussed, as evidenced by increased intensity of facial expressions, voice tone, expressive gestures or increase in speech quantity and speed.

**2 Very mild** Subtle and fleeting or questionable increase in emotional intensity. For example, at times seems keyed-up or overly alert.

**3 Mild** Subtle but persistent increase in emotional intensity. For example, lively use of gestures and variation in voice tone.

**4 Moderate** Definite but occasional increase in emotional intensity. For example, reacts to interviewer or topics that are discussed with noticeable emotional intensity. Some pressured speech.

**5 Moderately Severe** Definite and persistent increase in emotional intensity. For example, reacts to many stimuli, whether relevant or not, with considerable emotional intensity. Frequent pressured speech.

**6 Severe** Marked increase in emotional intensity. For example, reacts to most stimuli with inappropriate emotional intensity. Has difficulty settling down or staying on task. Often restless, impulsive, or speech is often pressured.

**7 Extremely Severe** Marked and persistent increase in emotional intensity. Reacts to all stimuli with inappropriate intensity, impulsiveness. Cannot settle down or stay on task. Very restless and impulsive most of the time. Constant pressured speech.

## 22. Distractibility

Degree to which observed sequences of speech and actions are interrupted by stimuli unrelated to the interview. Distractibility is rated when the individual shows a change in the focus of attention as characterised by a pause in speech or a marked shift in gaze. Individual's attention may be drawn to noise in adjoining room, books on a shelf, interviewer's clothing, etc. Do not rate circumstantiality, tangentiality or flight of ideas. Also, do not rate rumination with delusional material. Rate even if the distracting stimulus cannot be identified.

**2 Very mild** Generally can focus on interviewer's questions with only 1 distraction or inappropriate shift of attention of brief duration.

**3 Mild** Individual shifts focus of attention to matters unrelated to the interview 2-3 times.

**4 Moderate** Often responsive to irrelevant stimuli in the room, e.g., averts gaze from the interviewer.

**5 Moderately Severe** Same as above, but now distractibility clearly interferes with the

flow of the interview.

**6 Severe** Extremely difficult to conduct interview or pursue a topic due to preoccupation with irrelevant stimuli.

**7 Extremely Severe** Impossible to conduct interview due to preoccupation with irrelevant stimuli.

### **23. Motor hyperactivity**

Increase in energy level evidenced in more frequent movement and/or rapid speech. Do not rate if restlessness is due to akathisia.

**2 Very mild** Some restlessness, difficulty sitting still, lively facial expressions, or somewhat talkative

**3 Mild** Occasionally very restless, definite increase in motor activity, lively gestures, 1-3 brief instances of pressured speech.

**4 Moderate** Very restless, fidgety, excessive facial expressions, or non-productive and repetitious motor movements. Much pressured speech, up to one-third of the interview.

**5 Moderately Severe** Frequently restless, fidgety. Many instances of excessive nonproductive

and repetitious motor movements. On the move most of the time. Frequent pressured speech, difficult to interrupt. Rises on 1-2 occasions to pace.

**6 Severe** Excessive motor activity, restlessness, fidgety, loud tapping, noisy, etc., throughout most of the interview. Speech can only be interrupted with much effort. Rises on 3-4 occasions to pace.

**7 Extremely Severe** Constant excessive motor activity throughout entire interview, e.g., constant pacing, constant pressured speech with no pauses, individual can only be interrupted briefly and only small amounts of relevant information can be obtained

### **24. Mannerisms and posturing**

Unusual and bizarre behaviour, stylised movements or acts, or any postures which are clearly uncomfortable or inappropriate. Exclude obvious manifestations of medication side effects. Do not include nervous mannerisms that are not odd or unusual.

**2 Very mild** Eccentric or odd mannerisms or activity that ordinary persons would have difficulty explaining, e.g., grimacing, picking. Observed once for a brief period.

**3 Mild** Same as 2, but occurring on two occasions of brief duration.

**4 Moderate** Mannerisms or posturing, e.g., stylised movements or acts, rocking, nodding, rubbing, or grimacing, observed on several occasions for brief periods or infrequently but very odd. For example, uncomfortable posture maintained for 5 seconds more than twice.

**5 Moderately Severe** Same as 4, but occurring often, or several examples of very odd mannerisms or posturing that are idiosyncratic to the individual.

**6 Severe** Frequent stereotyped behaviour, assumes and maintains uncomfortable or inappropriate postures, intense rocking, smearing, strange rituals or foetal posturing. Individual can interact with people and the environment for brief periods despite these behaviours.

**7 Extremely Severe** Same as 6, but individual cannot interact with people or the environment due to these behaviours.