Edith Cowan University

Research Online

1-1-2021

A behaviour sequence analysis of goal generation processes in a psychosis rehabilitation sample

Esmira Ropaj

David A. Keatley

Joanne M. Dickson
Edith Cowan University

Corinna J. Milroyd

Peter J. Taylor

A behaviour sequence analysis of goal generation processes in a psychosis rehabilitation sample

Esmira Ropaj, David A. Keatley, Joanne M. Dickson, Corinna J. Milroyd & Peter J. Taylor

Published online: 26 Nov 2021.

Submit your article to this journal ☑

Article views: 304

View related articles ☑

View Crossmark data ☑

Routledge
Taylor & Francis Group

A behaviour sequence analysis of goal generation processes in a psychosis rehabilitation sample

Esmira Ropaj[a,b], David A. Keatley[c], Joanne M. Dickson[a,d], Corinna J. Milroyd[e] and Peter J. Taylor [b]

[a]Department of Psychological Sciences, University of Liverpool, Liverpool, UK; [b]Division of Psychology & Mental Health, University of Manchester, Manchester, UK; [c]School of Law, Murdoch University, Perth, Australia; [d]Division of Psychology, School of Arts and Humanities, Edith Cowan University, Joondalup, Australia; [e]Division of Health Research, C16 Furness College, Lancaster University, Bailrigg, UK

ABSTRACT

Background: It is suggested that goals are hierarchically organised, with goals at the highest level representing fundamental values and motivations. These abstract goals are said to have a series of sub-goals which represent a means of reaching higher-level goals. While a number of studies have explored goals in the context of psychosis, little is known about idiographic goal generation processes in those experiencing psychosis.
Methods: Using a Behaviour Sequence Analysis approach, the aim of the current study was to assess the feasibility of the goal task for use with individuals experiencing psychosis. A total of 73 adults receiving care from UK rehabilitation services completed a goal task designed to elicit higher-level goals.
Results: Results indicated that the goal task may be a feasible tool to support those experiencing psychosis to generate lower- and higher-level goals.
Conclusions: The goal task utilised in the current study may therefore be a valuable goal generation tool for use by clinicians.

Introduction

It is argued that humans are goal-directed organisms (Carver et al., 1996) with goal setting being fundamental in many aspects of life. For example, many of us set relationship, health and career goals (Cochran & Tesser, 1996). Goals provide us with a sense of meaning and purpose and are said to drive human behaviour (Dickson et al., 2017). The central importance of goals to our behaviour indicates that our wellbeing may be linked to us having and pursuing goals (MacLeod, 2017). Indeed, an extensive body of literature suggests that goal pursuit is linked to wellbeing (see Klug & Maier, 2015 for a review).

Control theories of goal pursuit and behaviour argue that goals are organised hierarchically (Carver & Scheier, 1990). Abstract goals sit at the highest level of the hierarchy and represent fundamental human values linked closely to an individual's sense of self (e.g. to be happy; Emmons, 1992). These goals are then served by a series of concrete goals that represent the means by which these higher-level[1] goals can be reached. It is argued that a single higher-level goal can be served by multiple lower-level goals (Carver & Scheier, 1982). For example, the abstract goal, "to be independent" might be served by the following concrete goals, "do own shopping" or "manage own finances". On the other hand, the same lower-level goal can serve multiple higher-level goals.

CONTACT Esmira Ropaj esmira.ropaj@postgrad.manchester.ac.Uk Division of Clinical Psychology, The University of Manchester, 2nd Floor Zochonis Building, Oxford Road, Manchester M13 9PL, UK

In non-clinical populations individuals are able to move flexibly across the different levels of the hierarchy so that they utilise the most appropriate goal for the circumstances they find themselves in (Watkins, 2011). Specifically, Watkins (2011) suggests that individuals may shift to lower-level goal engagement when progress is slower than expected or when individuals are presented with complex, unfamiliar or stressful life circumstances. The ability to move flexibly within and across the different levels of the hierarchy (i.e. goal flexibility) is linked to psychological wellbeing (Dickson et al., 2021), with goal inflexibly being associated with psychological distress (Dickson et al., 2017). Furthermore, the Goal Adjustment Theory argues that being able to disengage from unattainable goals and re-engage in alternative goals is beneficial for wellbeing (Wrosch et al., 2003).

Within clinical practice goals setting is fundamental in shaping the therapeutic work to be carried out and the generation of higher-level goals may be important in this process, particularly when lower-level goals appear difficult to achieve. For example, in being aware of an individual's higher-level goals we can support them to develop alternative lower-level goals that are workable and in line with their higher-level goal. Therefore, the development of tools that can be used by clinicians to help clients generate both lower-level and higher-level goals may be of significant clinical importance.

Using the Goal Task (J. Dickson & MacLeod, 2004) researchers have found that depressed individuals tend to generate abstract goals (Dickson & Moberly, 2013b). However, recently Varese et al. (2016) found that clinical voice hearers had difficulty with developing abstract goals and the task needed further development in order to support these individuals to generate higher-level goals.

While goals have been widely studied in clinical, sub-clinical and non-clinical populations (Dickson et al., 2017; Dickson & Moberly, 2013a; Dickson et al., 2016) little is known about goal generation processes in individuals experiencing psychosis and how these compare to the general population. A series of studies have; however, reported that future directed thinking is impaired in individuals experiencing psychosis (Goodby & Macleod, 2014; Yang et al., 2018). Abstract goals can be thought of as being more future focused, while concrete goals can be viewed as being more present focused. Therefore, individuals experiencing psychosis may have difficulties generating abstract goals and may require support in this process. Furthermore, goal generation processes may be impaired as a result of cognitive (e.g. hopelessness; Hoffmann et al., 2000) and neuropsychological factors (Fatouros-bergman et al., 2014).

Despite this, a number of studies have explored the goals of individuals experiencing psychosis. Ramsey et al. (2012) demonstrated that goals relating to employment, family and interpersonal relationships and education are of significant importance to individuals experiencing psychosis. However, others have suggested that many people with psychosis view themselves to have made little progress in achieving these goals (Iyer et al., 2012). Other work in the area has demonstrated that voices content and delusions are thematically linked to personal goals (Jakes et al., 2009; Rhodes & Jakes, 2000; Varese et al., 2016).

To date no study has sought to investigate goal generation processes in those with psychosis, with a focus on understanding goal content from a hierarchical perspective. An important first step in this process is seeking to assess the feasibility of the adapted Goal Task for use with individuals experiencing psychosis. It is anticipated that those experiencing psychosis hold higher-level goals; however, they may have difficulty with generating these for reasons noted above.

Behaviour Sequence Analysis (BSA: Keatley, 2018) is a method that allows for the investigation of sequential patterns between events and behaviours over time (Keatley, 2018). It aims to investigate dependence between events and behaviours as they unfold over a particular course or a period of time that then allows us to draw out important patterns in the data. BSA has been used previously to study patterns in self-harm amongst young people (Townsend et al., 2016), and more widely, to study patterns of non-verbal behaviour and deception (Marono et al., 2017) and driving under the influence of alcohol (Keatley et al., 2017).

Using this approach, it would be possible to map out the structure and sequential relationships between lower and higher-level goals. Owing to the novel nature of looking at temporal analyses of goal generation process in those with psychosis no formal hypotheses were made. To the authors knowledge this is the first study which aims to explore the feasibility of using the Goal Task to support individuals experiencing psychosis to generate higher-level goals and the first to apply BSA as a method within this clinical population. Our secondary aims are to gain an insight into how goals are organised within this population as well as developing an understanding of the content of common lower and higher-level goals of those with experiences of psychosis living in rehabilitation services. We recruited individuals accessing support from rehabilitation services as goals are likely to be especially important within this context. Rehabilitation services in the UK health system support individuals with long-term mental health difficulties to progress towards independent community living.

Method

Participants

Seventy-three individuals (n = 9 females, M_{age} = 39.49, SD = 10.15, range = 21–61 years) diagnosed with a psychosis spectrum disorder were recruited from 21 rehabilitation services across the North West of England (See Table 1 for further demographic and clinical information). Recruitment into the study was via study posters placed in mental health rehabilitation services within the UK, through the researcher attending service user meetings, and via service staff referrals. To be eligible for the study participants had to be i) aged 18 years or older, ii) diagnosed with a psychosis spectrum disorder confirmed via medical notes or self-report, iii) under the care of a psychiatric rehabilitation service, iv) able to provide informed consent (confirmed with their clinical team), v) proficient in

Table 1. Participant demographic and clinical information.

Variable	N (%)
Gender	64 (87.7%)
Males	9 (12.3%)
Females	
Ethnicity*	51 (71.8%)
White/White British	4 (5.6%)
Asian/Asian British	12 (16.8%)
Black/ African/Caribbean/Black British	4 (5.6%)
Mixed/ Multiple ethnic groups	
Diagnosis	34 (46.6%)
Paranoid Schizophrenia	20 (27.4%)
Schizophrenia	9 (12.3%)
Schizoaffective Disorder	6 (8.2%)
Bipolar Disorder	1 (1.4%)
Psychotic Depression	1(1.4%)
Unspecified non-organic psychosis	1(1.4%)
Drug-induced psychosis	1(1.4%)
Delusional disorder	
Education*	18 (25.4%)
Primary School	28 (40%)
High School	15 (21.1%)
College	3 (4.2%)
Degree	6 (8.5%)
Other (e.g. diploma)	
Employment	69 (93.2%)
Unemployed	3 (4.1%)
Employed	2 (2.7%)
Volunteer Work	

*Missing ethnicity and education data for 2 and 3 participants respectively.

English in order to complete the measures. Those with confirmed brain injury, or who had a diagnosed co-morbid intellectual disability or were on the autistic spectrum (confirmed by clinical team) were excluded from this study. Ethical approval for the study was granted by the local NHS ethics committee (17/NW/0005).

Data collection

Eligibility criteria were determined through liaising with clinical staff at each individual service. Following this, eligible individuals met with the researcher at the respective rehabilitation service, where informed consent was sought prior to the administration of the study measures. Here we focus on the data collected utilising the Goal Task (Varese et al., 2016).

Materials

The Goal Task (Varese et al., 2016) was used to help participants generate personal goals. The task required participants to firstly generate as many goals as came to mind within a three-minute period. Goals were defined as future experiences individuals were trying to achieve or accomplish over the next 5 years. This timeframe was selected to allow participants to generate goals that extend beyond their time with the service but was not too far into the future where it might be difficult for individuals to imagine. Following this, participants were asked to rate each of the goals generated in terms of importance on a scale of 0 ("not at all important") to 10 ("extremely important"), to ensure that participants were generating personally meaningful goals (Dickson & Moberly, 2013b). Participants were then asked to select their three most salient goals from the list of goals generated. These three goals were then individually subjected to a series of "why" questions (e.g. "Why is this goal important to you?") which aimed to help participants generate "higher-level" (i.e. cross-situational and self-defining; Varese et al., 2016) goals through capturing why the goal was important. This line of questioning continued until participants were no longer able to generate any further higher-level goals. The data collected using this task was then analysed using BSA (see Sections 2.4 and 2.5 for a full account of the analysis). Participants' responses to each of the "why" questions were hand recorded by the researcher. These responses and the participants' most important three goals from the first part of the task were transcribed by the researcher and formed part of the analysis. A small number of participants were only able to generate one (n = 4) or two (n = 4) goals during the first part of the task. As these goals had multiple levels to them, this data was included in the analysis as it still contained sufficient information to perform a BSA.

Coding scheme

Participants' responses were read, and a behaviour list of goals was developed using their responses. The category list was exhaustive and mutually exclusive to ensure that the participants' nuanced goals (e.g. go to the gym five times a week) were being captured in the analysis without any overlap or ambiguity, which is prerequisite in BSA (Keatley, 2018). The category list was developed by the lead researcher who then applied the categories to code the participants' goals resulting in a sequence of codes being developed for each individual, for each goal. The categories were then independently applied to the data by Author MJC (a research assistant with MSc level qualifications in psychology). Where disagreements were present coders met to discuss these issues, which were typically minor semantic differences or labelling issues. All coders agreed fully on the final list. As a final step in enhancing the reliability of the coding process a back-translation test (Lawrence et al., 2010) was used, where the codes developed were applied to a subset of the participants' goals to check that they captured the data accurately. This revealed that the coding scheme had accurately captured participants' goals without the loss of significant information.

Statistical analysis

Lag-one behaviour sequence analysis

A lag-one sequence analysis (the simplest form of BSA; Keatley, 2018) was conducted. This allowed us to investigate transitions between behavioural pairs, or in the context of the current study between goals that directly followed each other. The first goal in the pairing is referred to as the antecedent (e.g. getting out of the house) and the second goal in a pair is referred to as the sequitur (e.g. to be independent). BSA allowed us to investigate whether "getting out of the house" (goal A) leads to the goal "to be independent" (goal B) through testing whether the transition between A→B occurred more than would be expected by chance. These transitions between goals can then be plotted in a state transition diagram, which allows us to visually capture significant transitions within the data.

Statistical procedure

BSA was conducted in R (R Core Team, 2013) using a script written by Author DAK. The frequency of goals within the dataset were calculated to allow comparison with previous studies showing frequent goals. Next, the package calculated the frequency of transitions between goals (e.g. how many times does goal B follow goal A). Chi-square tests were then performed to determine significance, and standardised residuals scores showed which transitions were occurring above the level of chance. These significant transitions (antecedent to sequitur pairing, A→B) were then presented visually in a state transition diagram that allowed the progression of participants' goals to be viewed graphically. The state transition diagram captures standardised residual (SR) scores for individual transitions between goals that were found to be significantly larger than what would be expected by chance. Within our analysis the thickness of the transition arrow line (i.e. links) between goals is an indicator of the strength of the difference between the observed and expected value; the thicker the line the larger the SR. As BSA is not an inferential approach, it is not possible to establish the statistical power of the analysis. However, previous studies have successfully used samples ranging from n = 25 to n = 45 (Keatley et al., 2018; Townsend et al., 2016), with a recent studyutilising a sample of n = 1 (Keatley et al., 2018). It is important to note that BSA is a combinatorial approach to research, whereby adding more data adds to the sequences, thus some sequences are strengthened (remain significant) while others are over-written (lose their significance).

Results

Goal frequency and goal content

Participants' future goals were analysed using a lag-one BSA. The analysis began by first capturing the frequency of different goals categories (Table 2). The content of the goals set by our participants is consistent with the goals observed in earlier studies involving individuals experiencing psychosis (Ramsey et al., 2012). However, as can be seen, individuals also set goals which centre on their mental health experiences such as 'avoiding rehospitalisation and wanting to "have a normal life". Common themes across these mental health related-goals were around returning to normal life, moving away from psychiatric services, and gaining autonomy or freedom (e.g. "to be free", 'to make my own decisions and "to be in control of own life"). These goals should be interpreted within the context of the sample, who were residing within rehabilitation services. It is also clear that particular goals were more frequently reported by participants, such as wanting "to get a job" and "to be happy". While the goals generated in the first round of the goals task were predominantly concrete goals (e.g. to go to the shops), a small number of participants (n = 8) reported one higher-level abstract goal each (e.g. to be happy) in this first round.

Table 2. Frequency of goal across the whole sample.

Behaviour	Frequency
To get a job	21
To be happy	19
To be independent	18
To have my own accommodation	13
Have a normal life	12
Get back into education	10
To get fitter/healthier; Keep occupied/busy	9
Meet a girl/have a girlfriend; Avoid relapse; Get out of hospital/ward; Feel good about myself; Avoid rehospitalisation\keep out of hospital	8
Gain a sense of personal achievement/accomplishment; Avoid drugs; Help others; To reach personal fulfilment; Have companionship; To be free; Have a career; Look after mental health	7
Get married; Have my own family; Live independently; Develop personal interest/passions; Be in control of own life; Maintain wellbeing; To develop self-confidence	6
Lose weight; To feel positive; To have structure and routine; Earn money	5
Keep up with the gym/fitness routine; Meet new people; Personal growth/ development; To have children; To be healthy	4
Engage in healthy activities e.g. swimming, football, boxing; Avoid stress; Have a base to start from; Give back to the mental health community; Go on holiday(s); Own/buy my own car; To spend time with family; To volunteer; Have a close relationship with family; To make own decisions; To be a father to my son/daughter/children; To reach my potential; Become a businessman or own a business (e.g. restaurant/hotel); Be financially independent; Socialise with others; Become financially secure	3

The table above represents all goals that had a frequency of 3 or greater.
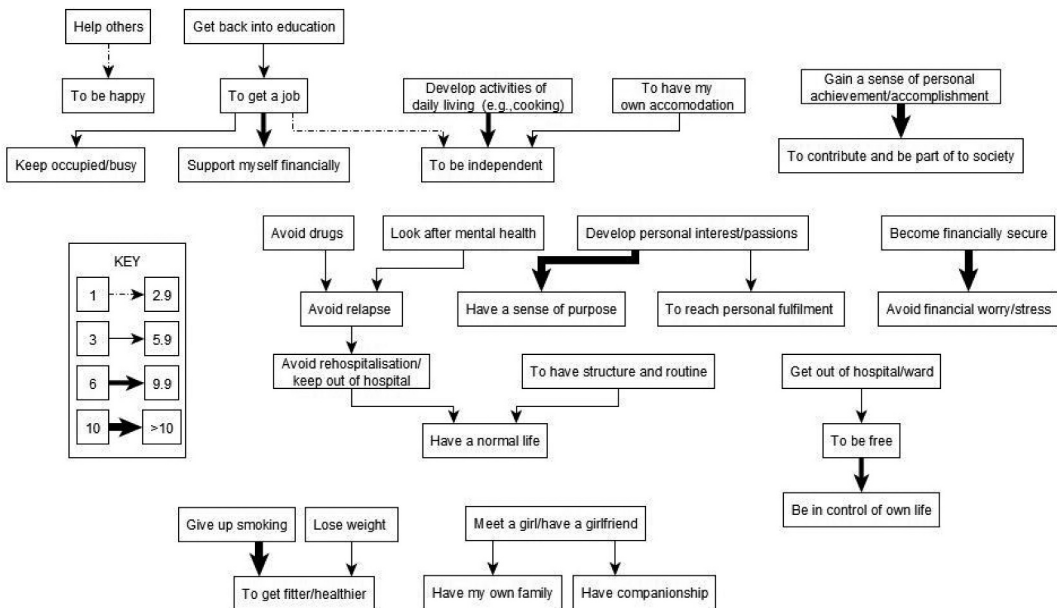
The state transition diagram

Conducting a lag-one BSA means that we analysed transitions between two goals only. We can see in Figure 1 that these transitions between two goals can form longer chains (i.e. wanting to "get back into education" is paired with wanting "to get a job" which is paired with wanting "to be independent"). Participants in the dataset gave mostly a progression of three goals. However, lag-one sequence analysis calculates pairs of behaviours (A→B). While it may be tempting to read and interpret the diagram as A→B→C, this would be incorrect, the diagram shows pairs of goals and the transitions between them, A→B, B→C). This analysis shows that those experiencing psychosis typically move from generating lower-level personal goals to goals of a higher-level nature. Our analysis revealed that transitions in all but one case were from lower to higher-level, thus suggesting that the task works in getting access to higher-level goals. For example, "develop personal interests/passions" is associated with the higher-level goal of wanting "to have a sense of purpose" (SR = 11.34, n = 2) and wanting "to reach personal fulfilment" (SR = 5.83, n = 2). SR values capture how likely the link between goals is, compared to if the goals occurred together by chance alone; the greater the difference between observed and expected the larger the SR value (Keatley, 2018). These results also suggest that the same lower-level goal may be linked to different higher-level goals, depending on the person. We can also see that multiple lower-level goals can serve one single higher-level goal, for example, "to get a job", "have my own accommodation" and "develop activities of daily living" are all important for the goal "to be independent", suggesting that there can be multiple ways in which a higher-level can be reached.

Discussion

The aim of the study was to assess the feasibility of using the goal generation task (Varese et al., 2016) to support individuals experiencing psychosis in developing higher-level goals. The task was observed to be an effective tool for supporting goal generation in those experiencing psychosis. More specifically, we found that individuals freely generated lower-level concrete goals (e.g. develop activities of daily living), but required support to develop higher-levels goals (e.g. to be independent). The results of the BSA also allowed us to demonstrate the hierarchical organisation of goals and highlighted how the same lower-level goal may be linked to distinct higher-level goals, and

Figure 1. State transition diagram. The diagram describes the conditional interdependence of the goals generated within the task, derived from the one-lagged BSA. An arrow indicates that there is an elevated probability of an individual following the initial goal with the one being pointed at by the arrow. A thicker arrow indicates greater interdependence (i.e. greater chance of going from the one goal to the next). The thickness reflects the standardised residual value (see key).

likewise, different lower-level goals may share common higher-level goals. Although the exploration of goal content was not an aim of the study, it feels important to draw attention to the themes observed within the goals as well as comment on their clinical significance.

The current findings are consistent with hierarchical models of goals and behaviour (e.g. Perceptual Control Theory; Carver & Scheier, 1990). However, those experiencing psychosis required support to generate higher-level goals, despite receiving instructions to generate personally meaningful and important goals that they would like to achieve in the next 5 years. This suggests that those experiencing psychosis may have difficulties with freely generating higher-level goals. It could be speculated that a number of factors, including neuropsychological differences (Fatouros-bergman et al., 2014) and pessimistic attitudes about goal achievement for those with psychosis (Lasalvia et al., 2014) may account for the observed difficulty. Furthermore, Watkins (2011) suggests that concrete goals may be more adaptive in difficult circumstances. Psychosis can present a challenge to an individuals' social, occupational and psychological functioning therefore, the pursuit of more manageable, lower-level goals may be adaptive in this clinical population. This may be particularly relevant for those who are sectioned and have little capacity to pursue higher-level goals (e.g. to be independent). Additionally, those experiencing psychosis may be more present focused as a result of social and clinical narratives around prognosis of psychosis. Therefore, concrete-level goals may be more accessible to them as they more clearly defined and time limited (Street, 2002).

Research indicates that goal inflexibility is linked to psychological distress (Dickson et al., 2021), therefore the development of goals across the different level of the hierarchy can have positive effects on wellbeing. The achievement of higher-level goals is dependent upon the achievement of lower-level goals. As such, understanding an individual's higher-level goals can be important when lower-level goals are thwarted as clinicians can support clients to identify other goals linked to their higher-level goal. This may be particularly important in contexts where, for an individual, the completion of a higher-level goal is dependent upon the successful completion of a single lower-

level goal (e.g. I can only over be happy if I find a partner). More broadly, an understanding of an individual's higher-level goals allows clinicians to support their clients to develop more accessible lower-level goals. However, the current findings suggest that those experiencing psychosis may require additional scaffolding to support them in the development and pursuit of abstract goals; the goals generation task can be a useful tool to support this work.

While we demonstrated that those experiencing psychosis had difficulty generating higher-level goals, further work using a control group is needed. This would allow us to understand how goal generation processes in those experiencing psychosis compare to the general population. On first observation; however, it appears that those experiencing psychosis may differ from clinically depressed individuals who have been observed to freely generate abstract goals (e.g. self-esteem, happiness; Dickson & Moberly, 2013a; Dickson et al., 2016). The observed difference may be reflective of difficulties observed in abstract thinking in individuals with psychosis (Oh et al., 2014) and the tendency of depressed individuals to think more abstractly (Watkins, 2007; Watkins et al., 2009). Depression is also characterised by other cognitive deficits like overgeneral memory (Gibbs & Rude, 2004), therefore, a tendency to generate abstract goals may be part of a constellation of depressogenic cognition that may differ in psychosis. Further research is, however, required to better understand the observed differences across the populations.

Employment and education goals are important for individuals experiencing first episode psychosis (Ramsey et al., 2012) as well as services supporting them (Rosenheck et al., 2017). However, our study shows that these goals are also important to those accessing rehabilitation services. The significance of employment and education within our sample may be reflective of the losses those with psychosis experience as a result of reduced opportunity for educational, occupational and social engagement (Rinaldi et al., 2010; Stain et al., 2012). Rehabilitation services may therefore benefit from drawing on the principles of the Boston Psychiatric Rehabilitation Approach; a person-centred approach focusing on service users' needs/goals in domains such as work, education and social engagement (Jormfeldt & Svensson, 2014). This approach has been successful in helping individuals attain their educational and occupational goals (Swildens et al., 2011) and can be important as attaining and making progress towards goals is linked to wellbeing (Klug & Maier, 2015).

Establishing romantic relationships was also valued by our participants, with the goal of wanting to find a girlfriend being important for having one's own family. These goals capture a desire for connectedness which has been viewed as important in the process of recovery (Leamy et al., 2011). Romantic relationships are viewed by those experiencing psychosis as normalising and as a marker of recovery (Redmond et al., 2010). However, despite their significance, White et al. (2020) argue that goals relating to romantic and intimate relationships are often neglected by mental health professionals. They found that risk aversive practices and a lack of existing guidelines and training opportunities were partly responsible (White et al., 2020). The studies presented here, along with ours, suggest that romantic relationships are important to those experiencing psychosis. It is therefore recommended that services work with individuals to identify their romantic relationship goals to ensure that individuals are supported to meet all their recovery goals.

Rehabilitation services are recovery orientated and aim to support individuals to meet their personal recovery goals, in line with modern definitions of recovery (Buckley et al., 2007; Leamy et al., 2011), that view recovery as a process of moving towards personally valued goals rather than the absence of symptoms. The goal task utilised in this study may be a useful tool for clinical staff within rehabilitation services to identify service users' personal goals. Understanding the linkage between lower and higher-level goals may help clinical staff to better understand why certain goals are important to service-users, and also better support service-users in achieving their goals. For example, if one lower-level goal (e.g. going to the shops) appears difficult to achieve, understanding the linked higher-level goal (e.g. becoming independent) may suggest alternative ways in which an individual can be supported (e.g. attending to their activities of daily living or online shopping).

A methodological limitation in the current research is that a lag-one BSA approach was taken. This means that sequences between pairs of behaviours were analysed (e.g. A→B and B→C). This also means that A effectively "stops" before B begins. In real life, however, behaviours and goals may overlap (e.g. [AB→C]). This type of higher-order analysis is possible; however, is often undesirable owing to factors like overfitting of data, and reduced predictions (see Keatley, 2018). Furthermore, we did not sequence how individual differences in life circumstances chain together to separate goals as we wanted to assess the feasibility of the task. Future research may want to take a life history approach to BSA, including antecedent life variables, allowing for longer chains to be developed. The generalisability of our findings is limited to White British males, given the make-up of the sample within the study. The sample consisted of individuals whose experiences fall within the psychosis spectrum. This was guided by continuum models that view psychotic experiences across diagnostic groups as occurring on a shared continuum (Guloksuz & van Os, 2018; Linscott & van Os, 2010). Nonetheless, there was heterogeneity in terms of the diagnoses participants received. Therefore, the conclusions drawn from our work may be applied only to the experiences studied. It is possible differences in goals may exist between groups, although it has been noted that even within diagnostic groups there is significant heterogeneity of experience (Allsopp et al., 2019) and that similar heterogeneity in goal content may also exist. The sample was also defined by a shared experience of being within rehabilitation services following a period of more acute illness, and many of the identified goals were understandable in this context (e.g. focus on autonomy). Finally, decisions relating to the parsing out of data can be subjective and may be considered a limitation of the current work. However, the use of the back-translation test did reveal that codes captured the key information relating to each goal and the final coding sequence was agreed on by two coders.

Overall the current study showed that the goal generation task may be a feasible tool for supporting those with the psychosis spectrum experiences studied here, to develop lower and higher-level goal. The Goal Task may therefore be a valuable tool for both researchers wishing to study goals, and for clinical staff working with individuals with the psychosis experiences specifically captured within the current study.

Note

1. Lower- and higher-order goals are referred to as lower and higher-level goals. We diverted from the typical language used in the existing literature because "higher-order" also refers to a particular method of Behaviour Sequence Analysis, and as such we wanted to avoid causing confusion.

Disclosure statement

ORCID

Peter J. Taylor http://orcid.org/0000-0003-1407-0985

Data availability

The authors do not have permission to make the data collected for this research publicly available.

References

Allsopp, K., Read, J., Corcoran, R., & Kinderman, P. (2019). Heterogeneity in psychiatric diagnostic classification. *Psychiatry Research*, *279*, 15–22. https://doi.org/10.1016/j.psychres.2019.07.005

Buckley, P., Fenley, G., Mabe, A., & Peeples, S. (2007). Recovery and schizophrenia. *Clinical Schizophrenia & Related Psychoses*, *1*(1), 96–100. https://doi.org/10.3371/CSRP.1.1.9

Carver, C. S., Lawrence, J. W., & Scheier, M. F. (1996). A control-process perspective on the origins of affect. In L. L. Martin & A. Tesser (Eds.), *Striving and feeling: Interactions among goals, affect, and self-regulation* (pp. 11–52). Psychology Press.

Carver, C. S., & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality–social, clinical, and health psychology. *Psychological Bulletin*, *92(1)*(1), 111. https://doi.org/10.1037/0033-2909.92.1.111

Carver, C. S., & Scheier, M. F. (1990). Origins and functions of positive and negative affect: A control-process view. *Psychological Review*, *97*(1), 19–35. https://doi.org/10.1037/0033-295X.97.1.19

Cochran, W., & Tesser, A. (1996). The what the hell effect: Some effects of goal proximity and goal framing on performance. In L. L. MArtin & A. Tesser (Eds.), *Striving and feeling: Interactions among goals, affect, and self-regulation* (pp. 99–120). Psychology Press.

Dickson, J., & MacLeod, A. (2004). Brief report anxiety, depression and approach and avoidance goals. *Cognition and Emotion*, *18*(3), 423–430. https://doi.org/10.1080/02699930341000013

Dickson, J. M., Johnson, S., Huntley, C. D., Peckham, A., & Taylor, P. J. (2017). An integrative study of motivation and goal regulation processes in subclinical anxiety, depression and hypomania. *Psychiatry Research*, *256*, 6–12. https://doi.org/10.1016/j.psychres.2017.06.002

Dickson, J. M., & Moberly, N. J. (2013a). Goal internalization and outcome expectancy in adolescent anxiety. *Journal of Abnormal Child Psychology*, *41*(3), 389–397. https://doi.org/10.1007/s10802-012-9685-9

Dickson, J. M., & Moberly, N. J. (2013b). Reduced specificity of personal goals and explanations for goal attainment in major depression. *PloS ONE*, *8*(5), e64512. https://doi.org/10.1371/journal.pone.0064512

Dickson, J. M., Moberly, N. J., O'Dea, C., & Field, M. (2016). Goal fluency, pessimism and disengagement in depression. *PLOS ONE*, *11*(11), e0166259. https://doi.org/10.1371/journal.pone.0166259

Dickson, J. M., Moberly, N. J., Preece, D., Dodd, A., & Huntley, C. D. (2021). Self-regulatory goal motivational processes in sustained new year resolution pursuit and mental wellbeing. *International Journal of Environmental Research and Public Health*, *18*(6), 3084. https://doi.org/10.3390/ijerph18063084

Emmons, R. A. (1992). Abstract versus concrete goals: Personal striving level, physical illness, and psychological well-being. *Journal of Personality and Social Psychology*, *62*(2), 292–300. https://doi.org/10.1037/0022-3514.62.2.292

Fatouros-bergman, H., Cervenka, S., Flyckt, L., Edman, G., & Farde, L. (2014). Meta-analysis of cognitive performance in drug-naïve patients with schizophrenia. *Schizophrenia Research*, *158*(1–3), 156–162. https://doi.org/10.1016/j.schres.2014.06.034

Gibbs, B. R., & Rude, S. S. (2004). Overgeneral autobiographical memory as depression vulnerability. *Cognitive Therapy and Research*, *28*(4), 511–526. https://doi.org/10.1023/B:COTR.0000045561.72997.7c

Goodby, E., & Macleod, A. K. (2014). *Future-directed thinking in first episode psychosis*. [Unpublished doctoral thesis]. Royal Holloway, University of London.

Guloksuz, S., & van Os, J. (2018). The slow death of the concept of schizophrenia and the painful birth of the psychosis spectrum. *Psychological Medicine*, *48*(2), 229–244. https://doi.org/10.1017/S0033291717001775

Hoffmann, H., Kupper, Z., & Kunz, B. (2000). Hopelessness and its impact on rehabilitation outcome in schizophrenia – An exploratory study. *Schizophrenia Research*, *43*(2–3), 147–158. https://doi.org/10.1016/S0920-9964(99)00148-6

Iyer, S. N., Mangala, R., Anitha, J., Thara, R., & Malla, A. K. (2012). An examination of patient-identified goals for treatment in a first- episode program in Chennai, India. *Early Intervention in Psychiatry*, *5*(4), 360–365. https://doi.org/10.1111/j.1751-7893.2011.00289.x

Jakes, S., Rhodes, J., & Issa, S. (2009). Are the themes of delusional beliefs related to the themes of life-problems and goals? *Journal of Mental Health*, *13*(6), 611–619. https://doi.org/10.1080/09638230400024877

Jormfeldt, H., & Svensson, B. (2014). Clients' experiences of the Boston psychiatric rehabilitation approach: A qualitative study. *Journal of Qualitative Studies on Health and Wellbeing*, *9*(1), 1–9. https://doi.org/10.3402/qhw.v9.22916

Keatley, D. A. (2018). *Pathways in crime: An introduction to behaviour sequence analysis*. Springer. https://doi.org/10.1007/978-3-319-75226-6

Keatley, D.A., Marono, A., & Clarke, D. (2018). Unmaking a murderer: Behaviour sequence analysis of false confessions. *Psychiatry Psychology and Law*, *25*(3), 425–436. https://doi.org/10.1080/13218719.2018.1463875

Keatley, D. A., Barsky, A. D., & Clarke, D. D. (2017). Driving under the influence of alcohol: A sequence analysis approach. *Psychology, Crime & Law*, *23*(2), 135–146. https://doi.org/10.1080/1068316X.2016.1228933

Keatley, D. A., Golightly, H., Shephard, R., Yaksic, E., & Reid, S. (2021). Using behavior sequence analysis to map serial killers' life histories. *Journal of Interpersonal Violence*, *36*(5-6), 2906–2928. https://doi.org/10.1177/0886260518759655

Klug, H. J., & Maier, G. W. (2015). Linking goal progress and subjective well-being: A meta-analysis. *Journal of Happiness Studies*, *16*(1), 37–65. https://doi.org/10.1007/s10902-013-9493-0

Lasalvia, A., Zoppei, S., Botetto, C., Tosato, S., Zanatta, G., Cristofalo, D., De Santi, K., Bertani, M., Bissoli, S., Lazzarotto, L., Ceccato, E., Riolo, R., Marangon, V., Cremonese, C., Boggian, I., Tansella, M., & Ruggeri, M. (2014). The role of experienced and anticipated discrimination in the lives of people with first-episode psychosis. *Psychiatric Services*, *65*(8), 1034–1040. https://doi.org/10.1176/appi.ps.201300291

Lawrence, C., Fossi, J., & Clarke, D. (2010). A sequential examination of offenders' verbal strategies during stranger rapes: The influence of location. *Psychology, Crime & Law*, 16(5), 381–400. https://doi.org/10.1080/10683160902754964

Leamy, M., Bird, V., Le Boutillier, C., Williams, J., & Slade, M. (2011). Conceptual framework for personal recovery in mental health: Systematic review and narrative synthesis. *The British Journal of Psychiatry*, 199(6)(6), 445–452. https://doi.org/10.1192/bjp.bp.110.083733

Linscott, R. J., & van Os, J. (2010). Systematic reviews of categorical versus continuum models in psychosis: Evidence for discontinuous subpopulations underlying a psychometric continuum. Implications for DSM-V, DSM-VI, and DSM-VII. *Annual Review of Clinical Psychology*, 6(1), 391–419. https://doi.org/10.1146/annurev.clinpsy.032408.153506

MacLeod, A. K. (2017). *Prospection, well-being, and mental health*. Oxford University Press.

Marono, A., Clarke, D. D., Navarro, J., & Keatley, D. A. (2017). A sequence analysis of nonverbal behaviour and deception. *Journal of Police and Criminal Psychology*, 33(2), 109–117. https://doi.org/10.1177/016502549301600205

Oh, J., Chun, J. W., Lee, J. S., & Kim, J. J. (2014). Relationship between abstract thinking and eye gaze pattern in patients with schizophrenia. *Behavioral and Brain Functions*, 10(1), 1–8. https://doi.org/10.1186/1744-9081-10-13

R Core Team. (2013). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. http://www.R-project.org/

Ramsey, C., Broussard, B., Goulding, S., Cristofaro, S., Hall, D., Kaslow, N., Killackey, E., Penn, D., & Compton, M. T. (2012). Life and treatment goals of individuals hospitalized for first- episode nonaffective psychosis. *Psychiatry Research*, 189(3), 344–348. https://doi.org/10.1016/j.psychres.2011.05.039.Life

Redmond, C., Larkin, M., & Harrop, C. (2010). The personal meaning of romantic relationships for young people with psychosis. *Clinical Child Psychology and Psychiatry*, 15(2), 151–170. https://doi.org/10.1177/1359104509341447

Rhodes, J. E., & Jakes, S. (2000). Correspondence betw een delusions and personal goals: A qualitative analysis. *British Journal of Medical Psychology*, 73(2), 211–225. https://doi.org/10.1348/000711200160435

Rinaldi, M., Killackey, E., Smith, J., Shepherd, G., Singh, S. P., & Craig, T. (2010). First episode psychosis and employment: A review. *International Review of Psychiatry*, 22(2), 148–162. https://doi.org/10.3109/09540261003661825

Rosenheck, R., Mueser, K. T., Sint, K., Lin, H., Lynde, D. W., Glynn, S. M., Robinson, D. G., Schooler, N. R., Marcy, P., Mohamed, S., & Kane, J. M. (2017). Supported employment and education in comprehensive, integrated care for first episode psychosis: Effects on work, school, and disability income. *Schizophrenia Research*, 182, 120–128. https://doi.org/10.1016/j.schres.2016.09.024

Stain, H. J., Galletly, C. A., Clark, S., Wilson, J., Killen, E. A., Anthes, L., Campbell, L. E., Hanlon, M.-C., & Harvey, C. (2012). Understanding the social costs of psychosis: The experience of adults affected by psychosis identified within the second Australian national survey of psychosis. *Australian & New Zealand Journal of Psychiatry*, 46(9), 879–889. https://doi.org/10.1177/0004867412449060

Street, H. (2002). *Exploring relationships between goal setting, goal pursuit and depression: A review*. Australian Psychologist, 37(2), 95–103. https://doi.org/10.1080/00050060210001706736

Swildens, W., Busschbach, J. T., Van, Michon, H., Kroon, H., Koeter, M. W. J., Wiersma, D., & Os, J. V. (2011). Effectively working on rehabilitation Goals: 24-month outcome of a randomized controlled trial of the Boston psychiatric rehabilitation approach. *The Canadian Journal of Psychiatry*, 56(12), 751–760. https://doi.org/10.1177/070674371105601207

Townsend, E., Wadman, R., Sayal, K., Armstrong, M., Harroe, C., Majumder, P., Vostanis, P., & Clarke, D. (2016). Uncovering key patterns in self-harm in adolescents: Sequence analysis using the Card Sort Task for Self-harm (CaTS). *Journal of Affective Disorders*, 206, 161–168. https://doi.org/10.1016/j.jad.2016.07.004

Varese, F., Tai, S. J., Pearson, L., & Mansell, W. (2016). Thematic associations between personal goals and clinical and non-clinical voices (auditory verbal hallucinations). *Psychosis: Psychological, Social and Integrative Approaches*, 8(1), 12–22. https://doi.org/10.1080/17522439.2015.1040442

Watkins, E. (2007). Reduced concreteness of rumination in depression: A pilot study. *Personality and Individual Differences*, 43(6), 1386–1395. https://doi.org/10.1016/j.paid.2007.04.007

Watkins, E. (2011). Dysregulation in level of goal and action identification across psychological disorders. *Clinical Psychology Review*, 31(2), 260–278. https://doi.org/10.1016/j.cpr.2010.05.004

Watkins, E., Baeyens, C. B., & Read, R. (2009). Concreteness training reduces dysphoria: Proof-of-principle for repeated cognitive bias modification in depression. *Journal of Abnormal Psychology*, 118(1), 55–64. https://doi.org/10.1037/a0013642

White, R., Haddock, G., & Varese, F. (2020). Supporting the intimate relationship needs of service users with psychosis: What are the barriers and facilitators? *Journal of Mental Health*, 1–729(3), 314–32. https://doi.org/10.1080/09638237.2019.1608928

Wrosch, C., Scheier, M. F., Miller, G. E., Schulz, R., & Carver, C. S. (2003). Adaptive self-regulation of unattainable goals: Goal disengagement, goal reengagement, and subjective well-being. *Personality and Social Psychology Bulletin*, 29(12)(12), 1494–1508. https://doi.org/10.1177/0146167203256921

Yang, Z., Ying-min, Z., Cheung, E. F., Zhang, R., Cheung, E. F., Wang, Y., Zhang, R.-T., Li, W.-X., Cheung, E. F. C., Kring, A. M., & Chan, R. C. K. (2018). Prospection deficits in schizophrenia: Evidence from clinical and subclinical samples. *Journal of Abnormal Psychology*, 127(7), 710–721. https://doi.org/10.1037/abn0000382