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Autobiographical memory functioning and response to inpatient  
treatment for people diagnosed with Schizophrenia Spectrum  
Disorders

and

Clinical Research Portfolio

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MA (Hons.) Psychology

MSc Applied Psychology with Children & Young People

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# CHAPTER 1: SYSTEMATIC REVIEW

## **Ways of Understanding and Measuring Metacognition in Schizophrenia Spectrum Disorders: A Systematic Review**

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# Ways of Understanding and Measuring Metacognition in Schizophrenia Spectrum Disorders: A Systematic Review

## *Abstract*

Metacognition is described as the awareness and understanding of mental states underpinning social behaviours. There is increasing interest in the role of metacognition in understanding symptoms and recovery in Schizophrenia Spectrum Disorders (SSD). But, to progress this research the various ways of conceptualising and measuring metacognition warrant systematic review and integration. For instance, because lab-based tests of discrete metacognitive processes have poorer ecological validity there has been a growth in research focused on measuring more complex aspects of metacognition. This diversification of measurement tools and concepts makes it timely to provide an integrative review. This review aimed to identify the various methods of assessing metacognition and evaluated the relative strengths and weaknesses of each method. Three databases were searched, a key journal was hand searched and an academic with knowledge of the literature was consulted, resulting in 19 papers for review. Five measures were included and rated for quality. Quality ratings ranged from low to moderate scores with low ratings typically due to failure to include participants in the generation of scales, insufficient evidence for factor structure, failure to examine floor/ceiling effects and limited interpretability. This review provides a summary of the relative strengths and weaknesses of the measures that can be used to guide measurement choices in future research.

## *Keywords*

Metacognition, Theory of Mind, Psychosis, Schizophrenia Spectrum Disorders, Assessment

## *Introduction*

### *Defining Metacognition*

The term metacognition was first used in the context of education to denote the ability to think about the thinking process while learning (Flavell, 1979). It has since come to define a much broader and more varied range of cognitive abilities and actions in the realm of social cognition. The associated concept of mentalisation has been used to describe an awareness and understanding of mental states, in oneself and others. This capacity is thought to underpin many human social behaviours.

It has been proposed that mentalisation is the mechanism that allows humans to understand the social world and their place within it (Fonagy, 1991; Bateman & Fonagy, 2010, Fonagy et al., 2002). Integrating psychoanalytic, developmental and neurocognitive thinking, Fonagy developed a theory of mentalisation as a developmentally achieved capacity. Mentalisation is related to metacognition but is conceptualised differently in that disturbed metacognition is not thought to occur only in the context of disturbed attachment (DiMaggio & Lysaker, 2015). Paul Lysaker and colleagues define metacognition as 'a spectrum of activities' that range from the experience of discrete cognitions through to the integration and synthesis of these into complex representations of the self and of others. These complex representations are understood to interact and influence one another and this synthetic ability allows people to form ideas about themselves and others in 'the flow of daily life' (Lysaker, DiMaggio and Brüne, 2014, p.100). Discrete acts of metacognition such as those often assessed by Theory of Mind (ToM) tasks (hinting, reading emotion in the eyes, irony detection, prosody understanding, visual jokes) differ from the integrative operations required to reflect on the mind of the self and other and to use that knowledge to adapt to the challenges of life.

There are also other ways of conceptualising metacognition. In the information processing model of metacognition advanced by Wells and Matthews (1994), disturbances of metacognition are formulated as central to the development of psychological difficulties. In the Self-Regulatory Executive Function (S-REF) model, vulnerability to psychological dysfunction and maintenance of impairments are associated with a cognitive-attentional 'syndrome' characterised by heightened self-

focused attention, threat monitoring, cognitive rumination, activation of dysfunctional beliefs, and self-regulation strategies that fail to modify maladaptive self-knowledge. These processes are driven by the individual's metacognitive beliefs that predispose them to the use of ruminative cognitive processing, maintain congruent selective attention and facilitate the interpretation of cognitive events. The model predicts an involvement of metacognitive beliefs in vulnerability to and the maintenance of psychopathology.

Another concept closely linked with metacognition is social cognition. This refers to processes involved in thinking about social interactions such as theory of mind, emotion processing and attributional style and is concerned with the accuracy of social perceptions and representations (Pinkham et. al., 2014). Social cognition is the ability to form complex ideas about social exchanges but it differs from metacognition because it is more concerned with the cognitive process driving social acts, whereas metacognition refers primarily to reflexive qualities, that is awareness of and ability to reflect on mental states of the self and others. There are overlaps between social cognition and metacognition in discrete mental activities including ToM and affect recognition (Lysaker, et. al., 2010).

The conceptual breadth of use within the literature creates challenges for researchers (Buck, Minor & Lysaker, 2015). Even a brief review of the literature demonstrates that terms such as 'mentalisation', 'metacognition' and 'theory of mind' are used virtually interchangeably (Lysaker, DiMaggio, et. al., 2007) and that these terms are used to refer to various cognitive operations which range in complexity, clinical relevance and applicability. Lysaker and colleagues (2007) argue that metacognition encompasses a range of concepts, which are semi-independent and overlap with other faculties, such as insight, empathy and imagination. Therefore, a structured review of the conceptualisation and measurement of metacognition is timely.

#### *Metacognition in Schizophrenia Spectrum Disorders*

Lab-based assessment of metacognition lack ecological validity and although the outcomes of the tasks provide information about deficits, they do not provide information about what helps or what might be remediated through cognitive therapies. As a result, methods of evaluating synthetic metacognitive processes had to be



developed. These generally make use of semi-structured interviews and the analysis of transcripts according to standardised methods which can be evaluated for inter-rater and repeated-rater validity. Metacognitive functioning has been evaluated in people with SSD compared to metacognition in people with addictions (Lysaker et. al., 2014; Vohs et. al., 2014), bipolar disorder (Tas et. al., 2014), anxiety (Wells & Carter, 2001), PTSD (Lysaker et. al., 2015), prolonged medical conditions (Lysaker et. al., 2014) and healthy controls (Hasson-Ohayon, et. al., 2015). The severity of metacognitive deficits has also been linked to concurrent levels of negative symptoms (Nicolò et. al., 2012; Rabin et. al., 2014) and with longer duration and severity of negative symptoms (Hamm et. al., 2012). More generally, given that metacognition is fundamental to forming a cohesive idea of the self and others, impairments in this faculty will negatively impact on the ability to make sense of one's life and those in it (DiMaggio & Lysaker, 2015).

Varese, Barkus and Bentall (2012) found limited support for a causal role of metacognition in hallucinatory experiences; when controlling for comorbid symptoms, associations between metacognitive beliefs and hallucinations were reduced. This suggests that metacognitive beliefs may have a more general role related to symptom maintenance, help-seeking, and distress (Sellers, et. al., 2016). Consistent with this, subsequent studies have shown that elevated metacognitive beliefs are associated with increased distress (Barbato et al., 2013; van Oosterhout et al., 2013) and a more severe and chronic course of illness (Austin et al., 2015).

Deficits in synthetic metacognition might create a substantial barrier for people diagnosed with SSD in reflecting on their learning from life experiences, applying this knowledge to negotiate complex social tasks. Impairments in metacognition have been found to be present prior to the diagnosis of SSD and so may reflect cognitive traits (Moritz & Woodward, 2007) that can mediate the relationship between neuropsychological deficits and functional outcome. This has recently been demonstrated in a sample of individuals presenting with a first episode of psychosis (Davies, Fowler & Greenwood, 2017). Moritz and Woodward (2007) identified metacognitive training as an effective method of intervention which aims to inform people diagnosed with SSD about cognitive biases and to provide corrective experiences to patients with the hope that it will improve symptoms and reduce the risk of relapse.

### *Measuring Metacognition in SSD*

Early conceptualisations of metacognition focussed on discrete acts that demonstrated ToM; that is, the awareness of one's own mind and the mind of the other in terms of emotional states and anticipated behaviour. Bell et al. (2010) differentiate between discrete social-cognitive ToM tasks, such as understanding irony and metaphor or appreciating visual jokes, 'social-perceptual ToM tasks', such as inferring mental states from eye expressions and more complex assessments based on structured interview. In research that concerns the real-world experience of individuals, these former tests have limited power to answer questions about how cognition and perception affects understanding of and action within the world. The latter assessments based on interview and discourse analysis are likely to be more directly helpful in developing interventions that address impairments in metacognition.

Measuring ToM is relatively simple and can provide reliable measures of deviation from normal task performance. Assessing a wider range of metacognitive abilities helps with understanding possible correlates of recovery, by exposing the treatment approaches that allow remediation of synthetic metacognition. Given that synthetic metacognition is more relevant to real-world contexts and clinical practice, this will be the area of interest to this review. This paper seeks to answer questions pertaining to the theoretical underpinnings and psychometric properties of synthetic metacognition assessment methods.

### *Complex Metacognition: a definition*

In this paper, synthetic metacognition is defined as semi-independent faculties that facilitate the ability to think about and integrate discrete metacognitive components on three dimensions: (1) awareness of and knowledge about one's own mind; (2) awareness of and knowledge about other's minds and (3) the ability to integrate and apply this knowledge to respond and adapt to interpersonal experiences and life's challenges.

### *Objectives*

This review aims to describe both how complex metacognition is measured in research with people diagnosed with SSD and the psychometric properties of the methods used.

## *Method*

The review was conducted in three phases. The first phase involved a search for and screening of relevant literature. The second phase involved exploring this literature to identify measures of synthetic metacognition. The reference sections of these papers were reviewed to identify papers which described the development and validation of the measures. The third phase focused on reviewing the quality of the measures using pre-defined criteria derived and adapted from Strauss and colleagues (2016).

### *Phase 1: Study Identification*

#### *Establishing Search String and Conducting a Computerised Database Search*

In collaboration with an expert librarian, a search algorithm was developed which would enable a systematic search of published literature. A comprehensive list of key words was compiled, based on relevant literature. There were three main components to the search string: metacognition, SSD and assessment. The search string was piloted and adjusted until sufficient scope was attained.

Truncation (\$) was used to maximise search sensitivity. Key words within each component were combined using the Boolean operator 'OR' and the four components were combined using 'AND'.

#### *Final Search String*

- Metacogniti\$ OR reflexiv\$ OR (reflective function\$) OR mentali\$ OR (theory of mind)
- Psycho\$ OR psychotic OR schizo\$ OR (schizophrenia spectrum disorder)
- Measur\$ OR analy\$ OR scale\$ OR assess\$

The following limits were applied to focus the output of the search:

- Language: English language papers.
- Type of citation: abstract available.

The search was conducted using three databases: Ovid Medline, PsycINFO (hosted by Ovid) and the Psychology and Behavioural Sciences Collection (hosted by EBSCOhost). To test the sensitivity of the search string, the reference section of each paper identified was

searched for further potentially relevant papers. An expert in the field was consulted to ensure that no key papers had been overlooked. A key journal, *Schizophrenia Research*, was hand searched.

#### *Screening for Relevance and Inclusion*

Articles were subjected to the following screening process: abstracts were reviewed for inclusion criteria, proceeding to scrutiny of the methods section where sufficient information could not be obtained.

#### *Inclusion Criteria:*

- Study must have reported data pertaining to participants with diagnosis of SSD
- Must directly measure or quantify synthetic metacognition
- Papers that report psychometric properties of the metacognition assessment tool
- Adult sample (aged 18 and over)
- English language papers
- Must present primary data

#### *Exclusion Criteria:*

- Papers reporting only discrete dimensions of metacognition
- Case studies
- Unpublished studies
- Reviews, meta-analysis, conference abstracts, book chapters, unpublished dissertations.

The principal reviewer carried out the screening process, consulting with a research advisor in cases where there was any doubt about an article meeting inclusion criteria. All articles that did not meet inclusion criteria were discarded. Where inclusion criteria were met, the paper progressed to the next stage of review.

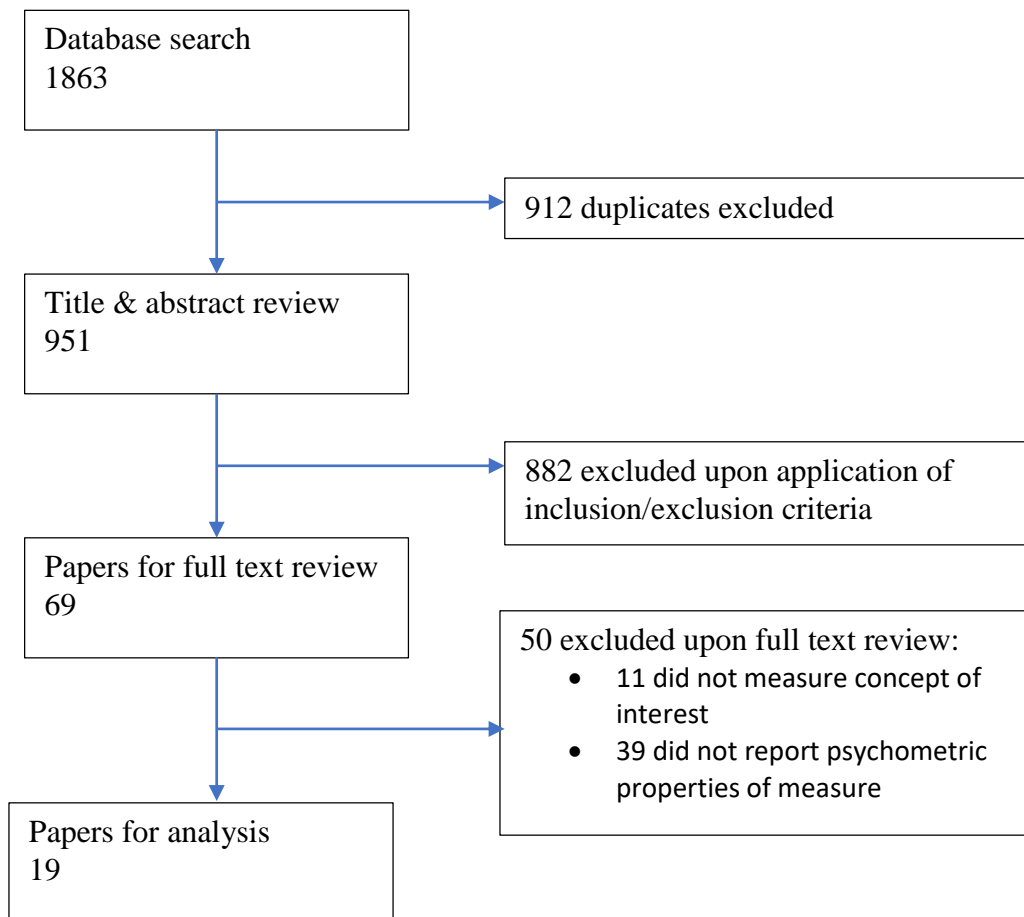


Figure .1: PRISMA flow diagram of search strategy

## *Phase 2*

### *Identification of Measures*

The nineteen papers identified by Phase 1 were read used to identify measures which had been applied in the measurement of synthetic metacognition. Using the reference sections of these papers it was possible to identify papers providing information about the development and validation of these measures. These were reviewed and their reference sections were consulted to scope for further relevant papers detailing concept development or psychometric assessment.

## *Phase 3*

### *Analysis of Quality*

Analysis of the quality of papers was adapted from the method used by Strauss and colleagues (2016) in a systematic review of the definition and measurement of compassion. Measures were rated using Terwee and colleagues (2007) quality criteria for

health status measures and Barker, Pistrang and Elliott's (2002) 'rules of thumb' for evaluating psychological measures. Terwee and colleagues measure awards a positive, intermediate or negative rating, or a rating of 0 where no information regarding the criterion is provided. Following the method of Strauss and colleagues, to make scores easier to interpret, in this review measures were given a score of 2 if there was evidence of the criterion being fully met, 1 or 0.5 if there was partial attainment (depending on the number of components being assessed within the factor), and 0 if the criterion was not met or the information was not reported. Scores were aggregated to provide an overall rating. A second researcher scored a sample of the measures and any discrepancies were resolved by discussion. Measures were rated across the following domains:

1. Content validity: the extent to which the domain of interest was sampled by the measure. The domain of interest was metacognition as defined in this review, rather than as defined by the scale authors.
2. Factor structure: whether the factor structure for the measure has been examined and supported.
3. Internal consistency: the extent to which items in a scale or subscale are inter-correlated and this measuring the same construct.
4. Test-retest reliability.
5. Convergent and discriminant validity: the extent to which scores on a scale relate to other measures in a manner consistent with theoretically derived hypotheses. validity, thus this is required for a score of 2 to be awarded.
6. Floor and ceiling effects: the number of respondents achieving the highest or lowest possible scores.
7. Interpretability: how differences in scores on the measure can be interpreted, or the degree to which qualitative meaning can be attached to quantitative scores.
8. Inter-rater reliability: the reliability of observations across raters on observational as opposed to self-report measures.

See Appendix 1.3 for detailed description and scoring anchors.

## *Results*

The process by which papers were selected for inclusion is illustrated in Figure 1. The search of electronic databases yielded a combined number of 1863 papers. These were transferred into Mendeley reference management software. 912 duplicate papers were

identified and removed from the sample. The remaining 951 papers were reviewed by title and abstract for relevance using the pre-defined criteria. Where there was dubiety, the method section of the full text article was reviewed. A further 882 papers were excluded based on inclusion and exclusion criteria and 69 papers progressed to the next phase of review. A further 50 papers were excluded at full text review, resulting in a final sample of 19 papers from the database search.

Table 1: Summary of quality ratings

Measure		Quality Criterion								
MAS-A										
		1	2	3	4	5	6	7	8	Total
Abu-Akel et al	2015	1.5	0	0	0	1	0	0	2	4.5
Hamm et al	2012	1.5	0	0	1	1	0	1	2	6.5
Hasson-Ohayon et al	2015	1.5	0	1	0	2	0	1	1	6.5
Lysaker et al	2005	1.5	0	0	0	2	0	0	2	5.5
Lysaker, Buck et al	2008	1.5	0	1	0	1	0	1	2	6.5
Lysaker, DiMaggio et al	2007	1.5	0	1	0	0	0	2	2	6.5
Lysaker, Ringer et al	2012	1.5	0	1	0	1	0	1	0	4.5
Lysaker, Vohs et al	2014	1.5	0	1	2	1	0	1	1	7.5
Lysaker, Warman et al	2008	1.5	0	0	0	1	0	0	1	3.5
Lysaker, DiMaggio et al	2010	1.5	0	0	0	1	0	1	2	5.5
Tas, Brown et al	2014	1.5	0	1	2	0	0	1	0	5.5
Trauelson et al	2016	1.5	0	1	0	1	0	2	0	5.5
Vohs, Lysaker et al	2014	1.5	0	0	0	0	0	1	1	3.5
Vohs, Lysaker et al	2015	1.5	0	0	0	1	0	0	1	3.5
MCQ-30										
		1	2	3	4	5	6	7	8	Total
Austin et al	2015	1.5	2	1	1	0	0	1	0	6.5
Van Oosterhout et al	2013	0.5	0	1	0	0	2	0	0	3.5
Østefjells et al	2015	1.5	0	1	0	0	0	0	0	2.5
Sellers et al	2016	1.5	0	2	0	2	0	1	0	6.5
Valiente et al	2012	1.5	0	2	2	0	0	0	0	5.5

### *Description of Measures*

#### *Metacognition Assessment Scale (MAS)*

Metacognitive Assessment Scale (Semerari et. al., 2003) was developed based upon three hypotheses: that metacognitive function has a modular structure; that for each type of psychopathological condition there is a different metacognitive deficit profile and that to be successful psychotherapy needs to involve an improvement in any deficient metacognitive sub-function.

The MAS was initially proposed and provisionally validated in a very small sample (n=2) of individuals diagnosed with personality disorder therefore it was not identified in the electronic search carried out pertaining to the question of interest to this review. However, given that the interview-based measure that has been widely used in research concerning SSD, it was pertinent to include information summarising the development and validation of the MAS and the quality rating assessment is presented in Table 2.

In terms of convergent validity and interpretability of results, the authors acknowledge that the presentation of data from two individuals does not allow for inferences to be made about the properties of the tool. Rather they are presenting data regarding the face validity and acceptability of the MAS to patients and practitioners in the very early stages of development. The total score on the quality rating is 4 out of 16. The MAS was then adapted, abbreviated and validated as detailed overleaf.

#### *Metacognitive Assessment Scale – Abbreviated (MAS-A)*

Metacognition Assessment Scale - Abbreviated (MAS-A; Lysaker et. al., 2005) is a rating scale that assesses synthetic metacognitive capacities. Lysaker and colleagues (2005) adapted this scale in collaboration with the authors of the original MAS (Semerari et. al., 2003).

Information pertaining to the qualitative interpretability of the quantitative scores was not reported in this paper, scoring 0 on the quality rating. Correlations between scores on the MAS-A and measures of neurocognition, quality of life (QoL) and symptoms were identified ( $r > .50$ ), giving a score of 2 for convergent and discriminant validity. A total score of 5.5 out of 16 was attained on application of the quality criteria. Details of psychometric properties are presented in Table 3.



Table 2: Psychometric properties of the MAS (Semerari et. al., 2003)

Sample	N	Content validity: factors	Content validity: Items	Proposed factor structure	Support for factor structure	Internal consistency: sample size	Internal consistency: Cronbach's $\alpha$	Test-retest reliability: $r$	Inter-rater reliability: $W$
Personality disorder	2	3 (1)	Experts = yes Recipients = no (1)	Not reported	Not reported (0)	Not reported (0)	Not reported (0)	Not reported (0)	0.935 0.931 $p < .01$ (2)

Table 3: Psychometric properties of the MAS-A (Lysaker et. al., 2005)

Sample	N	Content validity: factors	Content validity: Items	Proposed factor structure	Support for factor structure	Internal consistency: sample size	Internal consistency: Cronbach's $\alpha$	Test-retest reliability: $r$	Inter-rater reliability: $r$
SSD	61	3 (1)	Experts = yes Recipients = no (.5)	3 factor structure	Not reported (0)	$N < 100$ (0)	.39-.59 (0)	Not reported (0)	.89 (2)

Table 4: Psychometric properties of MAI (Semerari et. al., 2012)

Sample	N	Content validity: factors	Content validity: Items	Proposed factor structure	Support for factor structure	Internal consistency: sample size	Internal consistency: Cronbach's $\alpha$	Test-retest reliability: $r$	Inter-rater reliability: $r$
Non-clinical	175	3 (1)	Experts = yes Recipients = no (1)	4 factor structure	EFA, 2 factor model, CFA – partial confirmation (1)	$N > 100$ = Yes (1)	.85-.91 = Yes (1)	Not reported (0)	.41-.76 $p < .0001$ (1)

### *Metacognitive Assessment Interview (MAI)*

The MAI is a semi-structured clinical interview (Semerari et. al., 2012) adapted from the MAS (Semerari et. al., 2003) and based on the same theoretical framework. The MAI is intended to be less time consuming to administer than the MAS because metacognitive functioning is directly questioned as opposed to retrospectively assessed by standardized psychiatric interview.

Floor and ceiling effects (0) and aspects pertaining to interpretability of scores (0) based on this data set were not reported. Total score on application of the quality rating was 6 out of a possible 16, see Table 4.

### *Metacognitions Self-Assessment Scale (MSAS)*

The MSAS was developed by Pedone and colleagues (2017) in Italy. It is based on the work of Semerari and colleagues (2003) and is derived from the MAS and the MAI. The MSAS is an eighteen-item self-report measure which is scored using a Likert scale.

It has only been validated in a non-clinical sample. The total score based on quality criteria is 5.5 out of 15, given that this is a self-report scale, inter-rater reliability is not considered necessary and therefore not scored (meaning total available score is 14, not 16). See Table 5 for details of reported psychometric properties.

### *Metacognitions Questionnaire (MCQ)*

The Metacognitions Questionnaire (Cartwright-Hatton & Wells, 1997) is a 65-item questionnaire that was developed to assess beliefs about worry and intrusive thoughts. It is based on the Self-Regulatory Executive Function (S-REF: Wells, 2000; Wells & Matthews, 1994, 1996) model of psychological disturbance. No papers reporting use of this measure with people diagnosed with SSD were identified in the systematic search carried out for this review but to fully evaluate the properties of the MCQ-30, which has been used with this population, reporting of the original measure validation was identified as necessary to provide context.

In terms of concurrent validity, the MCQ was found to be moderately correlated with measures of personality traits in a manner posited by the authors in a non-clinical sample

(n=104). The authors also reported means and standard deviations for non-clinical participants, people diagnosed with obsessive-compulsive disorder, general anxiety disorder and clinical controls which demonstrated a pattern of scores with significant difference between groups. A total score of 11 out of 14 was attained, see Table 6.

#### *Metacognitions Questionnaire (MCQ-30)*

MCQ-30 is a briefer version of the MCQ that provides a multidimensional measure of metacognitive beliefs and monitoring tendencies linked to the general metacognitive theory of psychological disorder (Wells & Cartwright-Hatton, 2004). It employs that same 5 factor structure identified in the validation of the original MCQ and has the advantage of being shorter to administer.

MCQ-30 showed good internal consistency and convergent validity, and acceptable to good test–retest reliability. Positive relationships between metacognitions and measures of worry and obsessive–compulsive symptoms support for the validity of the measure as predicted by the metacognitive theory of intrusive thoughts postulated in the S-REF model. The authors reported that in terms of interpretability, there were no significant differences by sex and there were associations with the trait of pathological worry, however the details of this association were not reported. The psychometric properties of MCQ-30 are relatively robust with a score of 8.5 out of 14, see Table 7.

#### *Outcomes reported and associations with SSD*

The outcome variables reported to be associated with various aspects of metacognition were heterogeneous. There were some results that seem to have been replicated in more than one study. The main outcome variables significantly associated with metacognition are summarised in Table 8.

Table 5: Psychometric properties of MSAS (Pedone et al., 2017)

Sample	N	Content validity: factors	Content validity: Items	Proposed factor structure	Support for factor structure	Internal consistency: sample size	Internal consistency: Cronbach's $\alpha$	Test-retest reliability: $r$
Non-clinical	6659	3 (1)	Experts = yes Recipients = no (1)	5 factor structure	EFA = yes 4 factors (.5) CFA = yes (1)	N>100 = Yes (1)	.72-.87 = Yes (1)	Not reported (0)

Table 6: Psychometric properties of MCQ (Cartwright-Hatton & Wells, 1997)

Sample	N	Content validity: factors	Content validity: Items	Proposed factor structure	Support for factor structure	Internal consistency: sample size	Internal consistency: Cronbach's $\alpha$	Test-retest reliability: $r$
Non-clinical	863	1: own mind (.5)	Experts = yes Recipients = yes (2)	6 factors	EFA = yes, CFA = 5 factors (1.5)	306 (1)	.72-.89 (1)	.76-.94 (N=47) (2)

Table 7: Psychometric properties of the MCQ-30 (Wells & Cartwright-Hatton, 2004)

Sample	N	Content validity: factors	Content validity: Items	Proposed factor structure	Support for factor structure	Internal consistency: sample size	Internal consistency: Cronbach's $\alpha$	Test-retest reliability: $r$
Non-clinical	182	1: own mind (.5)	Experts: yes Recipients: no (1)	5 factors	EFA = yes, CFA = yes (2)	N=182 (1)	.72-.93 (1)	.75 (2) $p<.0005$

Table 8: Summary of associations between metacognition and key outcome variables

Paper	Measure	Correlated Outcome Variables
Abu-Akel et al (2015)	MAS-A	High psychopathy (>24 PCL-R) associated with higher overall metacognitive function (MF)
Hamm et al 2012		MF deficits associated with higher negative symptoms (PANSS)
Hasson-Ohayon et al 2015		UownM negative relationship social QoL UoM positive relation to social QoL SSD associated with deficits in SC & MF
Lysaker et al 2005		Higher UownM associated with better neurocognition & lower emotional withdrawal. Higher UoM associated with better verbal memory and less emotional withdrawal. Higher Mastery was associated with better verbal memory, insight and social function Higher Mastery associated with less emotional withdrawal and paranoia
Lysaker, Buck et al 2008		MAS total associated with internalised stigma
Lysaker, DiMaggio et al 2007		Low UownM associated with low working memory scores & higher disorganization on PANSS High UoM associated with better visual memory
Lysaker, Ringer et al 2012		SSD associated with lower total MAS & poorer scores on Hinting Test
Lysaker, Vohs et al 2014		MAS-A total score able to distinguish between SSD and HIV patients Poor MF associated with SSD
Lysaker, Warman et al 2008		Higher UownM associated with better mental flexibility in tasks Higher UoM associated with greater inhibitory control in tasks
Lysaker, DiMaggio et al 2010		Higher Mastery associated with higher scores on Social Cognition and Object Relations Scale
Tas, Brown et al 2010		Lower UownM correctly classified 85.2% of patients with SSD in logistic regression UownM & UoM related to verbal memory and executive functioning in SSD, but not in BD Higher positive & general symptoms associated with poorer MF in SSD
Trauelson et al 2016		High negative symptoms had poorer MF FEP associated with poorer MF than controls
Vohs, Lysaker et al 2014		Global MF & SC difficulties may be stable features of SSD
Vohs, Lysaker et al 2015		Higher insight associated higher MF, better vocabulary and ToM scores & fewer symptoms Mastery predicted clinical insight
Austin et al 2015	MCQ-30	Elevations in metacognitive beliefs were associated with the severity and duration of psychotic symptoms
Van Oosterhout et al 2013		Negative beliefs about voices associated with negative metacognitive beliefs
Østefjells et al 2015		SSD associated with higher scores on MCQ-30 subscales, except positive beliefs about worry Negative symptoms predicted lower scores on cognitive self-consciousness
Sellers et al 2016		Unhelpful metacognitive beliefs (higher MCQ-30 scores) predict negative affect in SSD
Valiente et al 2012		Psychological wellbeing is compromised in participants with a high level of persecutory thinking combined with low levels

		of cognitive self-consciousness
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Abbreviations: MF – metacognitive functioning; UownM – understanding of own mind; UoM – understanding other’s minds; BD – bipolar disorder; FEP = first episode psychosis; SC – social cognition; QOL – quality of life; ToM – theory of mind

## *Discussion*

This review had two main aims. The first was to describe how complex metacognition is defined and measured in research with people diagnosed with SSD. Secondly, we wanted to describe and evaluate the psychometric properties of the methods used.

### *Ways of conceptualising metacognition in SSD*

There are two main theoretical models currently used for conceptualising metacognition in research with people diagnosed with SSD. These were the modular Metacognitive Multi-Function Model (MMFM: Semerari et. al. 2003) and the S-REF information processing model (Wells & Matthews, 1994).

The MMFM was developed as a method of quantifying metacognitive acts as elicited in psychotherapy. It has been operationalised as modular scales which are applied to transcripts of semi-structured interviews such as the Indiana Psychiatric Illness Interview (IPII) or the Adult Attachment Interview (AAI) to assess the complexity of understanding of one’s own mind, understanding of others’ minds and mastery of this knowledge. Both the IPII and the AAI involve asking the interviewee about emotive aspects of their life story such as their relationships with their parents (particularly in the AAI), their experience of their diagnosis and associated difficulties (in the IPII) and memories of life events. This could be a potential challenge for use in research contexts where the interviewer and interviewee are unlikely to have a therapeutic relationship and where the discussion of this nature might be limited by the quality of the research-participant relationship. However, the narrative approach used in the MAS, MAS-A and MAI facilitate the generation of more complex material and may have higher ecological validity as participants described their thoughts and experiences with relatively little shaping of their answers, reducing the chance of biasing or influencing their responses.

The MSAS (Pedone et. al., 2017) is a recently developed and validated tool which may provide a bridge between semi-structured interview techniques and more structured questionnaires. This method of assessment is a hybrid approach, using the MMFM model

but providing a briefer and more structured method of assessment. This tool has only been trialled and validated with a non-clinical sample. Application of the MSAS in research with people diagnosed with SSD would be beneficial. It would be important to describe the psychometric properties demonstrated, including the face validity and acceptability of the MSAS to participants.

In the development of the MCQ and MCQ-30, hypotheses were generated from the S-REF model, clinical observations and extant research. These were tested to refine a tool that directly relates to hypothesised constructs. The questions asked in the MCQ and MCQ-30 relate to one's beliefs about thinking and worrying. These questions might be more suited to research contexts due to their briefer administration time and less emotive content.

It is unclear whether the S-REF and the MMFM derived measures assess the same constructs. The MMFM measures purport to assess distinctly reflexive aspects of metacognition, encompassing thinking about one's own mind, those of others' and synthesising that knowledge to adapt and respond in a complex manner to the interpersonal environment. The S-REF measures aim to be more attuned to thinking about one's own thinking and the beliefs associated with these cognitions. In terms of psychotherapeutic schools of thought, this might more readily correspond to Cognitive Behavioural Therapy approaches, whereas the MMFM associated measures seem to be more aligned with psychodynamic therapies.

#### *The psychometric status of methods for assessing metacognition*

The quality ratings obtained by application of the criteria used in this review revealed that the psychometric properties of methods assessing metacognition in SSD are limited and reported inconsistently. Content validity, that is the extent to which the domain of interest is captured by the measure was an area of relative strength as all measures were conceptually linked to the underpinning theoretical model. However, participant involvement in the development of tools was absent.

Factor structure was an area of weakness in both measures but was more robustly explored in the development of the S-REF measures. Internal consistency and factor structure were not robustly described in the papers reviewed, but this and factor analysis

were reported by Cartwright-Hatton and Wells (1997, 2004) in the non-clinical sample validation of the MCQ and MCQ-30. Test-retest reliability was insufficiently reported for both measures but inter-rater reliability was an area of more robust reporting in the MAS-A papers. Inter-rater reliability was not relevant for the MCQ-30 because it is a questionnaire.

The extent to which scores on either scale relate to other measures, consistent with theoretical hypotheses, was reported more frequently for the MAS-A but was limited for the MCQ-30. Floor and ceiling effects was an area of weakness for both measures and requires to be addressed. There was some exploration in the literature of problems with the Decentration scale on the MAS-A due to scores ranging from only 1-3, meaning that floor or ceiling effects are highly likely to be present. Lysaker, DiMaggio and colleagues (2010) have excluded this scale from statistical analysis for this reason. Perhaps factor analysis of the measure is necessary to address the Decentration factor. Both measures would benefit from more reporting regarding the qualitative interpretability of the scales and the quantification of what can be considered clinically meaningful change.

#### *Key correlates of metacognition across SSD*

Deficits in synthetic metacognition seem to be a consistent and perhaps distinguishing feature in SSD when compared to participants with chronic health challenges (Lysaker et al, 2014) and diagnosis of BD (Tas et al., 2010). An association between deficits in synthetic metacognition and negative symptoms has been reported in studies using both the MAS-A (Hamm et al., 2012) and the MCQ-30 (Austin et al., 2015) and have been replicated in studies using the MAS-A (Trauelson et al., 2016), although associations have also been found with positive symptoms (Tas et al., 2010). For example, higher metacognition as assessed by the MAS-A was predictive of insight into one's difficulties (Lysaker et al., 2015). There appear to be patterns of association that differ across subscales on both measures, such as the predictive role of Mastery in insight (Lysaker et al., 2005) and social cognition (Lysaker et al, 2010) and the associations between negative beliefs about voices and negative beliefs about metacognition (van Oosterhout et al., 2013) and that higher scores on the MCQ-30 predicts longer duration and greater severity of SSD (Austin et al., 2015). These associations warrant further evaluation but highlight



the centrality of complex metacognition in understanding SSD and providing effective psychotherapies for those experiencing it.

#### *Strengths and limitations of the review*

Metacognition is an important but broad and complex concept of import to psychological research and applied practice. This review aims to describe both how complex metacognition is measured in research with people diagnosed with SSD and the psychometric properties of the methods used. By applying the method used to similarly investigate the concept of compassion (Strauss et. al., 2016) this review aims apply rigorous methods to enhance the understanding of assessment of complex metacognition.

Due to how this area of research has evolved, a conventional systematic review method had to be adapted to address the aims of this review. This meant that context had to be provided by analysis of papers not detected by the electronic search method. These exposed limitations of the validity and reliability of measures used in this area in that they reported values for these factors that had not been assessed in the population of interest (SSD) and had not been developed with involvement of people diagnosed with SSD.

#### *Recommendations for future research*

Research evaluating synthetic metacognition in people diagnosed with SSD would benefit from increased transparency and rigour in the reporting of psychometric properties of all measures purported to measure this concept. Both methods may be open to risk of bias because the authors associated with the development of both measures are associated with most papers included in this review. It is not always clear whether data from the same participants have been repeatedly reported in the papers included in this review. Future research might benefit from declaring whether participants are from an existing dataset and consideration should be given to avoiding bias related to over use of the measure by a single research group.

A direct exploration of the extent to which the constructs evaluated by the S-REF and MMFM derived measures overlap and differ would be potentially valuable. No study has used both measures and explored associations between the two.

A potential weakness of the MAS-A, MAS, MAI and MSAS is the confirmation of factor structure and the problems identified with the Decentration scale (present in the MAS-A) because scores can range from only 1 to 3. The psychometric properties of the measures would benefit from further exploration and reporting of exploratory and confirmatory factor analysis.

Qualitative exploration comparing the results derived from and the acceptability of questionnaire and interview based measures with participants diagnosed with SSD would be a valuable addition to the literature. A meta-analysis of associations between outcome variables and subscales of both measure may also be timely given the breadth of findings already detailed in the literature.

### *Conclusions*

This review provides an analysis and summary of the conceptual basis and psychometric properties of methods of assessing metacognition that have been used in research with people diagnosed with SSD. It has identified distinct conceptual and methodological variations within the field which may assist researchers in determining which approach they wish to employ to interrogate their hypotheses, and can inform practitioners who wish to assess metacognition in clinical practice.

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## **CHAPTER 2: MAJOR RESEARCH PROJECT**

**Autobiographical memory functioning and response to inpatient treatment for people diagnosed with Schizophrenia Spectrum Disorders: Results from a Pilot Study**

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## Plain Language Summary

### *Background:*

People who are diagnosed with a Schizophrenia Spectrum Disorder (SSD) are often treated in hospital with medication. This is helpful for some people and they can leave hospital quickly, but some people don't respond to this treatment and they stay in hospital for a long time or must keep going back. This can be very disruptive; it interrupts peoples' ability to work, learn and have relationships.

We don't fully understand why some people get better more quickly than others in hospital. There is some evidence that psychological therapies can be especially helpful for people who don't respond well to medical treatment for schizophrenia but the ways in which these therapies work aren't clear. We need to understand more about the relationships between different thinking and remembering processes which seem to be affected in SSD so we can help people to recover.

Autobiographical memory (AM) seems to be affected in SSD and is thought to be vital to our personhood because it is the ability to recall our personal experiences.

Metacognition, most simply meaning to think about thinking (your own and other people's) also seems to be affected. These are both important for psychological therapy because therapies often require some ability to recall and reflect on our thinking, interpersonal challenges and past experiences.

### *Aims and Questions:*

This study attempts to find out if it is possible to examine the relationships between autobiographical memory, metacognition and recovery when people are experiencing psychosis and are in hospital. This hasn't been tried before using the same methods.

The primary research question asks whether AM and metacognition are correlated in people in the acutely experiencing psychosis. The second aim of the study is to explore relationships between other factors, such as recovery. Thirdly, the strengths and difficulties of the method used in this research will be discussed.

### *Methods:*

People were interviewed shortly after coming to hospital and again when they were nearing discharge. Their AM and metacognition were tested shortly after they were admitted to hospital.

### *Results:*

12 people took part in the study and there was evidence of a robust correlation between AM and metacognition.

### *Limitations:*

A small number of people took part in the study and this means that the results must be interpreted carefully. Although there was a correlation, from this project we cannot say what the direction of the correlation is. The assessments took a long time to complete for most people in the study and many people declined to participate. It might be that the study design wasn't very appealing to people in hospital affected by SSD. But with some refinements, this approach could be used with a larger number of participants.



# Autobiographical memory functioning and response to inpatient treatment for people diagnosed with Schizophrenia Spectrum Disorders: Results from a Pilot Study

## *Abstract*

*Background:* Impairments in executive functioning and autobiographical memory (AM) are common in people with schizophrenia spectrum disorders (SSD). There is a need for greater understanding of how neurocognitive factors such as these relate to recovery. This is important because improving treatments requires better understanding of the psychological process involved in recovery from SSD. *Aims:* We aimed to determine the feasibility of assessing AM and metacognitive functioning in the acute phase of psychosis during inpatient admission. Relationships between neuropsychiatric measures and autobiographical memory were explored with a view to refining the use of this assessment battery with participants who are acutely psychotic. *Methods:* Twelve people diagnosed with a schizophrenia spectrum disorder were recruited from adult inpatient psychiatric wards shortly after admission. They completed the Autobiographical Memory Interview, Indiana Psychiatric Illness Interview, Hayling Sentence Completion Task, BMIPB Story Recall Task and the Positive and Negative Syndrome Scale (PANSS) interview in baseline assessment. Four participants were re-tested prior to discharge and rated their own recovery using the Questionnaire on the Process of Recovery. Ward clinicians also rated recovery in terms of symptom remission for eleven of the participants. *Results:* A moderate correlation between metacognition and semantic AM ( $r=.716$ ) was identified at baseline. Correlations of moderate strength were identified between clinician ratings of recovery and metacognition ( $r=-.725$ ) and PANSS ( $r=.877$ ) scores at baseline assessment. *Conclusions:* The study faced difficulties recruiting sufficient numbers of eligible participants at baseline and retaining them to allow for follow up assessment. Hence, the results are preliminary but the data do suggest possible neuropsychological correlates of recovery from acute psychosis. If the recruitment and retention issues could be addressed, this paradigm could be applied to a larger sample to test the findings of this pilot study.

## *Key words*

schizophrenia spectrum disorders; metacognition; autobiographical memory; recovery; feasibility study

## *Introduction*

There is an established association between schizophrenia spectrum disorders (SSD) and impairments in memory and executive functioning, including impairments in episodic memory, over-general autobiographical memory and poor mentalising (Watson et. al., 2012). It is unclear how cognitive factors such as these change alongside aspects of recovery, such as reduction in symptom burden and duration of admission to inpatient psychiatric services.

Memory and executive functioning are important consistently identified areas of disruption of functioning in SSD (Berna, et. al., 2016). These deficits predict variance in recovery (Green, Llerena & Kern, 2015). However, the relationship between impaired autobiographical memory functioning in SSD and experiences such as symptom exacerbation and disturbed sense of self are poorly understood (Wood, Brewin, & McLeod, 2006).

Metacognition is also found to be impaired in SSD and like autobiographical memory, is thought to be important for understanding the experience of SSD and in psychological treatment (Lysaker et. al., 2007). Metacognition allows us to construct narratives about ourselves and the world and this helps us navigate new challenges (DiMaggio et. al., 2012). A breakdown in the ability to access personal memories from the past leads to an impoverished mental life and possibly more difficulty with meeting interpersonal and practical challenges. Autobiographical memory (AM) underpins the sense of a continuous, unified sense of self (Mishara et. al., 2014) and disturbances AM and sense of self is a common problem in SSD (for example, Danion, et. al., 2005). This ability to recall life events and make sense of feelings and experiences is important for many therapeutic interventions (Lingington, 2010).

## *Autobiographical Memory in SSD*

The episodic memory system retains knowledge of recent episodes over varying retention intervals measured in minutes and hours up to decades (Tulving, 2002). The AM subcomponent of episodic memory retains knowledge of personal events and facts over much longer retention intervals measured in weeks, months, years and across the life span. There is meta-analytic evidence that, along with impairments in episodic memory

and executive functions, AM is impaired in people diagnosed with SSD, with moderate to large effects seen for features such as specificity of recall, richness of detail, and the intensity of subjective re-experiencing (Berna, et. al., 2015).

AM is intrinsic to a preserved sense of self and personal identity (Riutort, et. al., 2003) and entails the ability to recall personal events and facts pertaining to one's life, such as name, where one attended school or first job. It is commonly sub-divided into personal semantic memory (facts about the self) and personal episodic memory (event memory). Tamlyn and colleagues (1992) investigated autobiographical memory in four people diagnosed with schizophrenia using the Autobiographical Memory Interview (AMI; Kopelman, et. al., 1989) and concluded that it was impaired across the life span, with relative sparing of early memories. Feinstein and colleagues (1998) used the same paradigm with 19 individuals with schizophrenia and 10 healthy controls and identified a U-shaped distribution of scores. That is, memories for childhood and recent events were relatively preserved but recall was much poorer for the period of symptom onset, early in adult life. It is theorised that this deficit may reflect disruption in encoding or acquisition processes (Elvevåg, Maylor & Gilbert, 2003). The evidence indicates that people diagnosed with SSD demonstrate an over-general style of recall for personal life events but findings regarding the pattern of recall over time are inconsistent (Wood, Brewin, & McLeod, 2006).

Using a Remember, Know, Guess paradigm, Danion and colleagues (2005) compared AM recollection of people diagnosed with SSD to that of control participants and found that AM recollection was poorer in terms of frequency and consistency across the life span. In addition, SSD participants were significantly more likely to provide a Guess response. This may be linked to the finding that over-general recall has been observed in people diagnosed with SSD. This lack of specificity may be a compensation for the absence of confidently-recalled AM (Ricarté, et. al., 2014). Therefore, there is converging evidence that AM is impaired in SSD and that this deficit is manifest in both personal semantic and episodic memories and that these difficulties are consistent with a disrupted sense of self in schizophrenia (Riutort et. al., 2003). It is not yet known but it can be theorised that disturbances in autobiographical memories affecting sense of self in SSD will be associated with metacognitive abilities, because metacognition facilitates the experience of complex thinking about the self and others, and the use of this information to solve

problems (Pec, Bob & Lysaker, 2015). Potthegadoo and colleagues (2017) reported data which suggest that cueing strategies can improve AM recall in SSD, which identifies this as a promising target of remedial therapies.

#### *Metacognition, Mentalising and Self-Awareness in SSD*

Metacognition, mentalising, self-awareness and Theory of Mind (ToM) all refer to a person's ability to "think about thinking", about both their own minds and the minds of others (Lysaker, et. al., 2007). Awareness of one's strengths and difficulties is a form of metacognitive knowledge that can recruit cognitive resources to a specific task and allows a person to identify what external resources they might need to draw upon to function effectively (Flavell, 1979). An inability to form complex representations of the mind of the self and others is associated with impaired insight and a higher burden of negative symptoms in SSD (Lysaker, et. al., 2017). ToM refers to relatively discrete metacognitive acts, such as reading emotional cues in facial expressions or perceiving sarcasm (Bora & Pantelis, 2016). Synthetic metacognition refers to a more complex understanding of minds and the ability to use this knowledge in inter- and intrapersonal problem solving. Lysaker and colleagues (2005) identified associations between metacognition, symptoms, quality of life, neurocognition and poorer awareness of illness in SSD. For example, understanding of one's own mind, others' minds and the ability to use this knowledge to solve problems was associated with better performance on several dimensions such as social functioning and insight into difficulties. These findings combined with evidence of impaired awareness of cognitive deficits in SSD (Cella, et. al., 2014) and an association between metacognition, insight and problem solving in SSD, making it a promising target for treatments (Chan et al., 2004).

#### *Recovery in Schizophrenia Spectrum Disorders*

Recovery in schizophrenia is variable with many potential outcomes, the indicators of which are not yet well understood (Lieberman & Kopelowicz, 2009). Within the prevailing biomedical framework of understanding, recovery is predominantly defined in terms of symptom remission and factors such as frequency of hospital admission or duration of hospital stay (National Institute for Health and Clinical Excellence, 2010). Conceptualising recovery in this way neglects other salient aspects of functioning and it seems that for individuals experiencing SSD, psychosocial factors are identified as more important in

their recovery than neuropsychiatric factors (Morrison, et. al., 2013). Clinicians, researchers and people living with schizophrenia may conceptualise recovery differently (Jääskeläinen et. al., 2013) and views regarding what constitutes recovery vary between people diagnosed with SSD. Reliably assessing the multi-factorial concept of recovery is difficult and a method of doing so has not yet been established, particularly in the acute phase of distress such as admission for psychiatric stabilisation. In this study, the feasibility of collecting subjective ratings of both symptom remission and psychosocial factors was examined.

In summary, disruptions to sense of self are consistently identified in people diagnosed with SSD but whether AM deficits underpin disruptions to metacognition is not yet known. Recovery is heterogeneous in schizophrenia spectrum disorders in terms of how it is defined and how it is realised; it is not determined by medication and symptom remission alone. To design effective treatments, it is important to understand the psychological processes of recovery in SSD. This exploratory study pilots a novel method of examining correlations between AM, metacognition and recovery in SSD and seeks to answer questions regarding the feasibility of the methods used.

### *Aims*

This exploratory study trials a method of examining the relationships between autobiographical memory, metacognition and executive functioning factors during the acute phase of SSD. Previous studies have compared groups of people with poorer versus better recovery which may be a less robust method of evaluating these factors. Data collected allows for exploration of correlations between variables and can provide answers to feasibility questions such as recruitment and retention rates and pilot questions such as, can this method be applied to research with the sample population? By answering these questions, we can inform the generation of hypotheses and methodologies for future research.

### *Hypothesis*

It is hypothesized that performance in the Autobiographical Memory Interview and metacognition as measured by the adapted Metacognitive Assessment Scale will be correlated at baseline assessment.

### *Design & Methodology*

This research study employs a repeated measures design allowing for both within and between subjects' analyses. In addition to attempting to answer the hypothesis, this study has a primary focus on addressing feasibility questions such as whether it is possible to recruit and retain participants to test the hypothesis and whether AM and metacognition can be examined using the tools selected. Pilot questions such as whether this protocol can be successfully applied to this population are answered and practical facilitators and barriers are discussed in this exploratory study.

Data were collected from people diagnosed with SSD who were admitted to inpatient wards for acute care. Data collection was carried out over three months between March 2017 and June 2017.

### *Ethics & Governance*

Ethical approval was provided by NHS West of Scotland Research Ethics Committee (see Appendices 2.2 & 2.3). Approval was also gained from NHS Greater Glasgow and Clyde Research and Development Department and each sector's Clinical Governance groups.

### *Participants*

Participants 18 years or older with a diagnosis of a SSD were recruited from inpatient adult mental health wards in NHS Greater Glasgow and Clyde. People with a recognised cognitive deficits such as a Dementia or Learning Disability or a history of head injury with loss of consciousness were excluded. Eligibility was determined through discussion with the referring professional and the initial interview with the participant. Intoxication with alcohol or illicit substances at the time of testing and any illicit substance use within the preceding 24 hours also led to exclusion. In addition, those without adequate command of English were excluded, as were any participants that were not able to give informed consent at the time of assessment.

### *Recruitment*

Screening discussions were held between the ward staff and the researcher to identify eligible participants. Once identified, a staff member discussed the project with the

service user, provided them with an information sheet (see Appendix 2.4), and gained verbal consent for the researcher to meet with them. Written informed consent was obtained prior to participation (see Appendix 2.5).

All participants had been admitted to inpatient wards in the NHS Greater Glasgow and Clyde Health Board. One participant was detained in an intensive psychiatric ward which is a locked, medium secure ward. Recruitment sites were located across the city of Glasgow; in the North East sector there are six wards, located in two hospital sites and recruitment was attempted in all but one of these wards. In the South there are four wards, recruitment was active in one of these wards and in the North West there are four wards, recruitment was active in one of these.

### *Sample Size*

We wanted to determine if it was feasible to recruit people diagnosed with a schizophrenia spectrum disorder at the time of admission to inpatient care and to complete measures of autobiographical memory functioning and metacognition. This is an exploratory study piloting a paradigm investigating patterns of recovery and interactions between variables (measures of AM and metacognition) that can be used to make power estimations for future trials (Lancaster, Dodd & Williamson, 2004). The study seeks to address both feasibility and pilot questions of relevance to further research (Arain et. al., 2010).

### *Measures*

The Autobiographical Memory Interview (AMI: Kopelman, Wilson & Baddeley, 1989) tests a subject's recall of facts from their life history over three broad life stages: childhood, early adult life and recent incidents. The AMI measures personal semantic and episodic memory at different time points by asking participants to recall semantic information (such as their home address) and episodic memory (by recounting a memory of a personal incident). Similar questions are asked for each life stage allowing for measurement of the pattern of AM over three time points. This test is not dependent on the individual's general knowledge or interest in current affairs. The AMI has high inter-rater reliability and the score will provide a comparison for better or poorer AM within a range of functioning because it has been validated and normed with clinical populations.

The Metacognition Assessment Scale-Abbreviated (MAS-A: Lysaker, et. al., 2005) has been developed for use with individuals experiencing psychosis and has been extensively used in the literature (e.g. Abu-Akel & Bo, 2013; Pec, Bob & Lysaker 2015). The MAS-A will be applied to transcripts from the Indiana Psychiatry Illness Interview (IPII: see Lysaker et. al., 2002 for paradigm). The IPII is designed to elicit a narrative from the individuals about themselves and about illness. This measure is unique in that it produces a narrative of the self in which evidence of metacognitive acts can be described spontaneously with minimal scaffolding which minimises cueing effects and therefore should produce a more accurate assessment of synthetic metacognitive capacity (Lysaker et. al., 2010). The MAS-A is subdivided into four scales: Self Reflectivity, which is briefly defined as the comprehension of one's own mental state; Understanding of Others Mind, or the comprehension of other's mental states; Decentration, which is the ability to understand that others have independent motives; and Mastery, which is the ability to use mental state information to accomplish cognitive tasks or cope with psychological distress. Metacognition is thought to exist on a continuum of function, so the MAS-A is scored on an ordinal scale with higher scores denoting greater complexity.

The Positive and Negative Symptom Scale (PANSS; Kay, Fiszbein & Lindenmayer, 1987) is a widely used 30-item scale examining a range of symptoms commonly observed in patients with psychotic disorders. This measure will be administered to provide an assessment of overall symptom burden subdivided into positive, negative and general symptoms.

The Brain Injury Rehabilitation Trust (BIRT) Memory and Information Processing Battery story recall task (BMIPB; Coughlin, Oddy & Crawford, 2007) will be used to provide a measure of general memory functioning. The BMIPB provides a repeatable assessment of memory (recall and recognition) and speed of processing. The Story Recall task tests immediate and delayed recall abilities. This subtest has been shown to have high inter-rater reliability;  $r=0.9$ .

The Hayling Sentence Completion Test (HSCT, Burgess & Shallice, 1996) consists of two sections of fifteen sentences and measures response initiation and inhibitory control. In the first section participants are asked to produce a single word to complete a sentence.



In the response inhibition condition participants are asked to produce a word that is contextually nonsensical to complete the sentence. The HSCT has been used extensively to assess executive functioning in people with schizophrenia (e.g. Chan et al., 2004; Joshua et al., 2009).

The Brenner Scale of Clinical Change in Schizophrenia (Brenner Scale: Brenner et. al., 1990) is a clinician rating used to measure the perceived degree of symptom remission, referred to here as clinician rating of recovery. This uses a Likert scale from Level 1 – Clinical Remission to Level 7 – Severely Refractory. Each level on the scale is accompanied by a brief operational definition of its meaning in terms of response to antipsychotic medication and degree of supervision required in social, personal and vocational domains of functioning.

The Questionnaire on the Process of Recovery Scale (QPR) assesses patient's perception of individual recovery (Neil, et. al., 2009). This instrument was developed in collaboration with service users in the UK and has been validated for use within a population with similar demographic characteristics as those recruited to this study. The QPR is a 22-item measure that is divided into intrapersonal factors and interpersonal factors. Neil and colleagues (2009) evaluated the validity of the QPR and reported that it has good internal consistency, construct validity and reliability. As such, it is suitable for use as a clinical and research tool to assess and promote recovery in psychosis. It can be used as a one-off measure or repeated over time.

### *Procedure*

#### *Baseline assessment (T0)*

Following the collection of informed consent and demographic information participants first completed the Hayling Sentence Completion task, this was followed by the immediate recall component of the Story Recall task. The Indiana Psychiatric Illness Interview was then administered; this section of the interview was recorded and then transcribed. This was followed with the delayed component of the Story Recall task, ensuring that this was completed within 40 minutes ( $\pm 2$ ) of the immediate task, before completion of the Autobiographical Memory Interview. Finally, the Positive and Negative Syndrome Scale semi-structured interview was administered. Participants were offered

breaks between assessments and on three occasions the testing was carried out over more than one session; on one occasion this was due to visitors arriving to see a participant and on two occasions this was because participants were too affected by symptoms to continue to engage in the assessment. In all instances the assessment was completed the following day.

#### *Follow up assessment (T2)*

As in the first assessment, the Sentence Completion task was administered first, followed by immediate Story Recall. The AMI and PANSS were then administered, with delayed Recall after 40 ( $\pm$  2) minutes. The participant then completed the QPR. Following the assessment, the Brenner Rating of Clinical Change was completed by a staff member with knowledge of the participant. If a suitable person was not available on the day of the follow up assessment, efforts were made to complete this scale on the next possible date.

#### *IPII coding*

The IPII was coded using the Metacognition Assessment Scale - Abbreviated (MAS-A; Lysaker et al., 2005) as previously described. Training in the application of the MAS-A to the IPII was provided by Professor Paul Lysaker via Skype. A subset of four transcripts were scored by Lysaker's team to ensure reliability. The external rater was blind to details and status of the participant but the primary researcher was not.

### *Results*

#### *Feasibility & Recruitment*

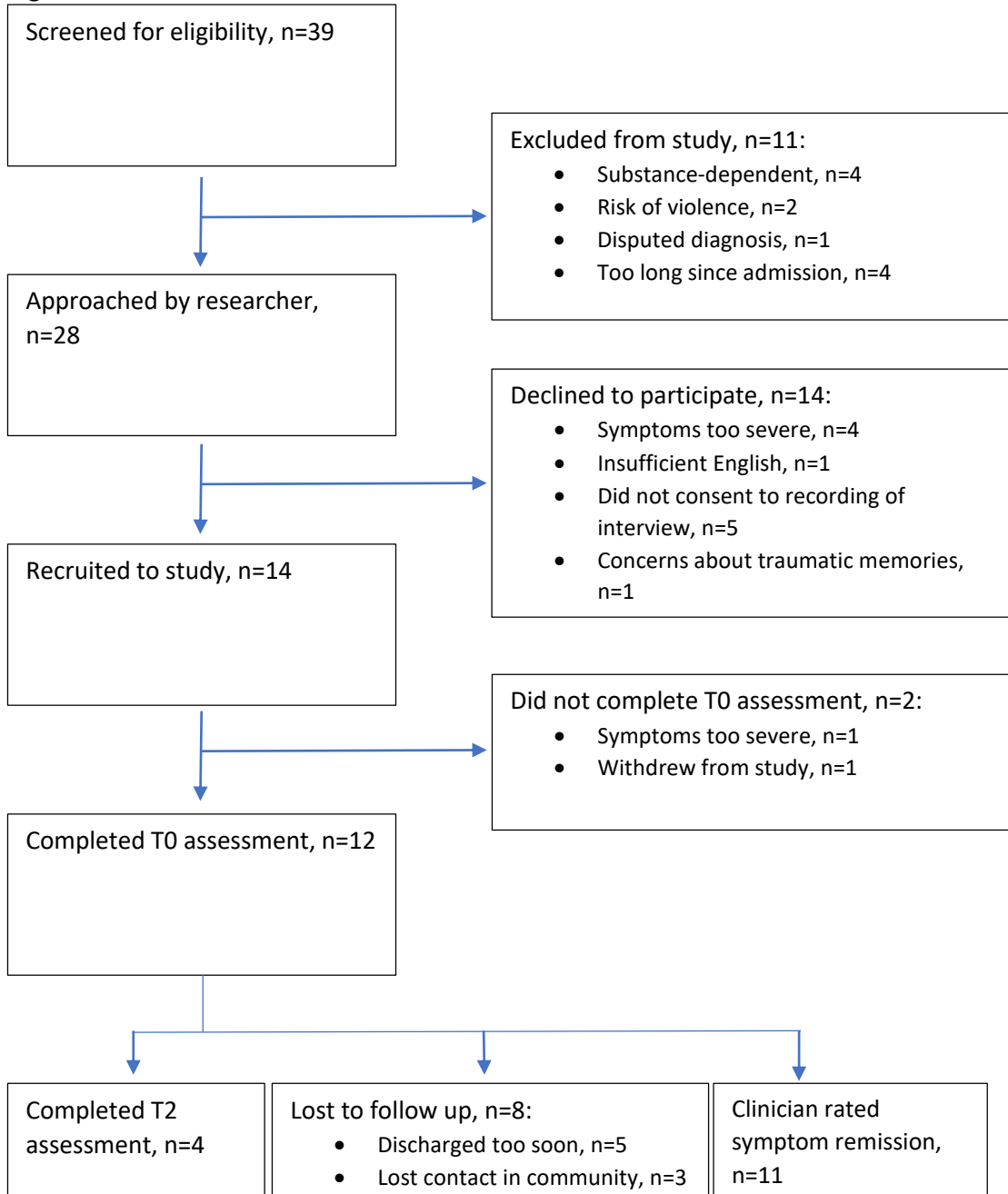
Thirty-nine individuals were screened, eleven were excluded at this stage, based on current dependence on alcohol or non-prescription drugs (n=4), significant risk of violence (n=2), disputed diagnosis awaiting second opinion (n=1) and too long since admission to hospital (n=4). Twenty-eight people were approached, fourteen of whom declined to participate. Reasons identified were the person was unable to complete informed consent due to symptom severity (n=4), insufficient English language ability (n=1), declined due to concerns about recording part of interview (n=5), declined due to concerns about 'recovering traumatic memories (n=1) and declined without giving a reason (n=3).

Fourteen people were recruited to the study and completed informed consent procedures, of these, twelve people completed baseline assessment. One person withdrew from the study due to concerns about confidentiality and impact of participation on treatment within the ward and another was unable to complete the baseline assessment. Participation took place over one or two sessions, depending on the needs of the participant and ward restrictions such as meal times or visiting hours. Follow up participation took place over a single session.

All but one of the participants who completed baseline assessment were recruited from the North-East sector. One participant admitted to a ward in the South sector completed baseline and follow up assessment and one participant admitted to a ward in the North East completed informed consent but was unable to complete baseline measures.

Four people completed the entire follow up assessment, eight people were lost to follow up for all measures except the Brenner Rating Scale of clinical change during admission (completed by clinical staff). Reasons identified for attrition were the speed with which an individual was discharged following admission (n=5) and when follow up appointments had been arranged when discharge was imminent, contact details were incorrect or messages were not responded to meaning that the assessment could not be conducted in the community despite plans to do so (n=3).

Figure 1 - PRISMA recruitment flow chart



### *Demographic Information*

At the time of assessment, all participants were detained under the Mental Health (Care and Treatment) (Scotland) Act 2003. Ten participants were male and two were female, the mean age at participation was  $40.8 \pm 11.3$  years. All participants had a diagnosis of a schizophrenia spectrum disorder, eight were diagnosed with paranoid schizophrenia, three with a psychotic episode and one with psychotic depression and paranoid schizophrenia. All participants were prescribed neuroleptic medication and all were detained in hospital at first assessment.

Table 1 – Summary of descriptive data

Descriptive data for all baseline assessment measures			
	Mean (SD)	Median (IQR)	Descriptor
Age	40.83 (11.34)	45 (27.50-50.75)	
Days in hospital at T0	11.00 (7.14)	9 (8.25-13.75)	
Immediate story recall	10.67 (8.22)	11.5 (2.25-18.75)	-2 SD
Delayed story recall	7.58 (7.46)	6 (.25-13.00)	-1 SD
Hayling raw score test A	22.66 (18.12)	16.5 (12-30)	
Hayling raw score test B	56.08 (25.27)	63 (29.75-69.75)	
Hayling categorical score	3.08 (2.07)	2.5 (1-6)	Abnormal
AMI semantic total	46.08 (11.63)	51 (38.63-53.00)	Definitely abnormal
AMI episodic total	13.00 (6.11)	14 (8.25-17.00)	Probably abnormal
MAS-A total	9.58 (4.86)	9.25 (4.88-13.75)	
Understanding one's own mind scale	4.00 (2.15)	3.5 (2-5)	
Understanding others minds scale	2.50 (1.09)	2 (1.63-3.38)	
Decentration scale	0.63 (0.61)	0.5 (0-1)	
Mastery scale	2.54 (2.05)	2.25 (1.00-4.13)	
PANSS total	75.67 (16.24)	72.5 (61.50-91.25)	Moderate overall symptom severity
PANSS positive scale	20.42 (6.49)	19.5 (14.75-25.75)	
PANSS negative scale	18.33 (7.66)	16 (12.25-25.75)	
PANSS general scale	36.92 (7.35)	36 (30.00-44.25)	

### *Statistical Analyses*

Non-parametric correlations were explored using the Spearman's Rho test. Relationships between variables at baseline were explored and correlations between these and symptom remission were tested.

Patterns of autobiographical memory recall were compared to those reported in key comparison papers and post hoc analysis using Wilcoxon signed-rank tests was carried out.

## *Main Findings*

### *Significant correlations between measures at baseline*

The null hypothesis can be tentatively rejected in this study because a moderate correlation between MAS total score and AMI total Personal Semantic ( $r=.716$ ,  $p<.05$ ) was identified at baseline. A correlation was also found between MAS total and PANSS total scores ( $r=-.688$ ,  $p<.05$ ) and this correlation held between MAS total score and PANSS negative symptom subscale ( $r=-.636$ ,  $p<.05$ ). The MAS decentration subscale was highly positively correlated with PANSS negative subscale ( $r=.877$ ,  $p<.005$ ) which violated expectations.

### *Correlations between baseline measures and clinician-rated recovery*

AM functioning at baseline was not correlated with clinician-rated symptom remission. However, there was a significant correlation in the direction we would expect between total MAS-A score and rating of symptom remission ( $r = -.725$ ) meaning that poorer remission correlates with low scores on the MAS-A. The strongest correlation was identified with the mastery scale ( $r = -.785$ ) and the understanding one's own mind scale also correlated with remission ( $r = -.654$ ); the remaining subscales (other's minds and decentration) were not correlated with remission.

Total PANSS score was correlated with remission rating ( $r = .877$ ) indicating that higher symptom burden is associated with poorer clinician-rated recovery. The correlation was significant for the general ( $r = .687$ ) and negative ( $r = .607$ ) symptom subscales, no correlation was identified between the positive subscale and remission.

Table 2 - Correlations between scores and clinician rating recovery

Variable	Clinician rating of recovery
AMI personal semantic score	-.191 (p = .575)
AMI personal events score	-.425 (p = .193)
Total MAS-A score	-.725 (p = .012)*
Self	-.654 (p = .029)*
Other	-.063 (p = .854)
Decentration	-.501 (p = .116)
Mastery	-.785 (p<.001)*
Total PANSS score (T0)	.877 (p<.001)*
Positive scale	.505 (p = .113)
Negative scale	.607 (p = .048)*
General scale	.687 (p = .019)*

### *Pattern of AM recall*

The mean total AMI performance scores indicated that ability to remember personal semantic information was in the “definitely abnormal” range (M = 46.08, SD = 11.63) and that ability to recall personal events was in the “probably abnormal” range (M = 13, SD = 6.11). For personal semantic information, there were no statistically significant differences by lifetime period (childhood median = 17.08, IQR = 15.63-18.38; early adulthood median = 14.46, IQR = 9.75-18.88; recent median = 14.54, IQR = 12.75-18.88). Post hoc analysis with Wilcoxon signed-rank tests found no significant difference between childhood and early adulthood (Z = -.85, p = .398), early adulthood and recent (Z = -.28, p = .783) nor childhood and recent (Z = -.67, p = .503).

Table 3 –Comparison of pattern of AM recall over time

Mean AMI performance (and standard deviations)				
		Childhood	Early Adulthood	Recent History
Personal Facts	A	12.55 (3.89)	10.83 (4.74)	15.9 (2.51)
	B	17.08 (1.41)	14.46 (6.25)	14.54 (6.10)
Personal Events	A	4.65 (2.31)	4.3 (2.32)	6.35 (1.72)
	B	5.00 (2.04)	3.92 (2.87)	4.08 (2.31)

A – McLeod, Wood and Brewin (2007) schizophrenia sample, B – this sample

In contrast with the findings of Feinstein and colleagues (1998) and McLeod, Wood and Brewin (2007) a U-shaped pattern of autobiographical recall was not observed in this sample.

### *Discussion*

Even within this small sample of data, there are signals that indicate correlations of moderate strength between metacognition and semantic AM, and between total symptom burden and metacognition. Of interest, negative symptom burden was correlated with metacognitive scores which agrees with previously reported findings (Nicolò, et. al., 2012). Unexpectedly, the decentration subscale of the MAS-A was highly correlated with negative symptom scores, indicating that higher negative symptom burden is correlated with difficulties in seeing the self and one's behaviours at the centre of the world. This could be an idiosyncratic result related to the small sample size, and as with all the relationships identified, warrants further exploration with a larger sample to confirm the strength of the findings.

There was a significant correlation between metacognition at baseline and clinician-rated symptom remission. Due to the small sample and design of the study, no conclusions can be drawn regarding the direction of causality in this relationship: it may be that people with who demonstrate higher metacognitive skills are more likely to be perceived as having remitted symptoms by clinicians or it may be that metacognition predicts remission of symptoms. The results suggest that metacognition, in particular understanding of one's own mind and mastery, correlate with remission. These findings warrant further investigation to better delineate relationships and explore causality.

As previously discussed, there is some evidence of loss of AM recall for the early adult period in SSD and it has been postulated that this indicates a deficit in recall for the time in life when SSD difficulties commonly emerge. It could be reasonably expected that this sample would show evidence of a similar curve in the data, however there was highest recall of childhood personal facts and events. There was no corroboration available for the memories described in the AMI, some of which could be queried as confabulations or inaccuracies, particularly in participants who demonstrated high levels of positive symptoms.



### *Recruitment & Retention*

It is possible that a briefer assessment would have been more acceptable to potential participants and it may be that being asked about one's memories was perceived as too intrusive, presenting a barrier to participation.

The higher recruitment and retention rates in the North-East sector are likely to be related to the researcher being employed in that sector. Established relationships with nursing staff seemed to be an important factor in supporting recruitment. A practical factor that might have improved retention rates would have involved a formal method of communication between nursing staff and the researcher. If the researcher had been able to attend weekly multi-disciplinary meetings or if a member of staff had been identified to fulfil a liaison role, it is possible fewer people would have been lost to follow up due to discharge.

Clearly identifying the researcher's role and level of independence from the clinical team should be considered. The researcher worked in some of the recruitment wards, was an NHS employee and was sometimes introduced to potential participants as "the psychologist" which occasionally led to confusion and had to be clarified by the researcher. Future studies might have greater recruitment and retention success if researchers have one defined role within the ward and can regularly work with staff and patients in that capacity. Time invested in building rapport with ward staff and patients was important to achieving the sample size that was ultimately attained.

### *Limitations*

All conclusions derived from the analysis of the data are significantly limited in their generalizability and power by the small sample size. It was not possible within the time allocated to collect data from a large enough sample to generate statistical power in the analysis. Further to this, it was not possible to carry out an analysis of performance across baseline and second assessments due to the significant number of participants lost to follow up. The small sample also precluded analysis of neuropsychological tests used in the assessment. Depending on the hypothesis under examination, the assessment could be made briefer, and therefore more acceptable to participants, by excluding one or more of these tools.

The primary researcher was not blind to the status of participants and although calibration was attempted at the training stage with all measures, only a sub-set of data was double rated and compared.

Due to the inability to check the veracity of information provided in the AMI, all data were treated as valid memories and scored in accordance with the AMI manual. Future studies could benefit from controlling for potential confabulation by obtaining corroboration for memories where possible. In addition, there was no formal test of effort used in this study meaning that disengagement or lack of motivation has not been controlled for in this study.

#### *Future considerations*

Enrolling people who are experiencing acute psychosis is challenging because of both symptoms and the legal context of treatment which can impair communication and the development of rapport. Individuals may find it difficult to complete consent or may not wish to because they are suspicious about the nature of the research, this may be because they are concerned that whether they engage will influence staff thinking and decisions made about their care, despite the researcher's assurances to the contrary. A third of people approached agreed to participate in the study and reasons for declining to participate were related to the recording of the IPIL, which was required for the application of the MAS-A, and to discussing personal life events. It may be that the subset of people who did agree to participate are different to those who declined and exploring this might be useful in future trials.

To substantiate some of the preliminary findings of this study regarding associations between metacognition, symptom burden and recovery, further studies with larger sample sizes are necessary. To address some of the issues discussed here future researchers may wish to consider issues such as bias in recruitment, retention to follow-up and corroboration of memories . A larger sample size may allow for further analysis to explore the nature of these tentative findings.

### *Conclusions*

Whilst we provide preliminary evidence of an associations between metacognitive ability and recovery and symptom burden and recovery, there are many methodological limitations which may limit the generalisability of these findings. Nonetheless, this has allowed us to pilot and evaluate the research methods used and to identify ways that research into the study hypotheses could be progressed in the future. The method showed promise but practical challenges that affected recruitment and retention require to be addressed.

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## Appendices

### Appendix 1.1: Submission Requirements for Journal of Clinical Psychology

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**Objective(s):** Succinctly state the reason, aims or hypotheses of the study.

**Method (or Design):** Describe the sample (including size, gender and average age), setting, and research design of the study.

**Results:** Succinctly report the results that pertain to the expressed objective(s).

**Conclusions:** State the important conclusions and implications of the findings.

In addition, for systematic reviews and meta-analyses the following headings can be used, Context; Objective; Methods (data sources, data extraction); Results; Conclusion. For Clinical reviews: Context; Methods (evidence acquisition); Results (evidence synthesis); Conclusion.

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**Commentaries.** Occasionally, the editor will invite one or more individuals to write a commentary on a research report.

**Editorials .** Unsolicited editorials are also considered for publication.

**Notes From the Field** offers a forum for brief descriptions of advances in clinical training; innovative treatment methods or community based initiatives; developments in service delivery; or the presentation of data from research projects which have progressed to a point where preliminary observations should be disseminated (e.g., pilot studies, significant findings in need of replication). Articles submitted for this section should be limited to a maximum of 10 manuscript pages, and contain logical topical subheadings.

**News and Notes .** This section offers a vehicle for readers to stay abreast of major awards, grants, training initiatives; research projects; and conferences in clinical psychology. Items for this section should be summarized in 200 words or less. The Editors reserve the right to determine which News and Notes submissions are appropriate for inclusion in the journal.

## Appendix 1.2: Search Strategy for Systematic Review

Database	Search Terms Used	No of Papers Found
PsycINFO	Metacogniti\$ OR reflexiv\$ OR (reflective function\$) OR mentali\$ OR (theory of mind) AND Psycho\$ OR psychotic OR schizo\$ OR (schizophrenia spectrum disorder) AND Measur\$ OR analy\$ OR scale\$ OR assess\$	1014
Psychology and Behavioural Sciences Collection	Metacogniti\$ OR reflexiv\$ OR (reflective function\$) OR mentali\$ OR (theory of mind) AND Psycho\$ OR psychotic OR schizo\$ OR (schizophrenia spectrum disorder) AND Measur\$ OR analy\$ OR scale\$ OR assess\$	108
Ovid Medline	Metacogniti\$ OR reflexiv\$ OR (reflective function\$) OR mentali\$ OR (theory of mind) AND Psycho\$ OR psychotic OR schizo\$ OR (schizophrenia spectrum disorder) AND Measur\$ OR analy\$ OR scale\$ OR assess\$	741

### Appendix 1.3: Quality Rating Criteria and Scoring Anchors

1. Content validity, that is the extent to which the domain of interest was sampled by the measure. The domain of interest was metacognition as defined in this review, rather than as defined by the scale authors. For this criterion to be fully met the three dimensions of the definition of synthetic metacognition must be captured by the items or scales of the tool and the tool must have been developed by both academic experts and people with lived experience of SSD. If both conditions are met, a score of 2 will be awarded.
2. Factor structure, that is whether the factor structure for the measure has been examined and supported. A score of 2 was given where exploratory factor analysis (EFA) followed by confirmatory factor analysis (CFA) have been conducted on independent samples or where CFA had been conducted if the factor structure had been previously posited theoretically and when the proposed factor structure was supported by the factor analysis. A score of 1 was given if only EFA had been conducted and if the EFA supports the factor structure. A score of 0 was given where either factor analysis had not been conducted or where EFA and/or CFA had been conducted but had not supported the postulated factor structure.
3. Internal consistency, meaning the extent to which items in a scale or subscale are inter-correlated and this measuring the same construct. For this criterion to be fully met criteria factor analyses had to have been performed on an adequate sample size ( $7 * \text{number of items}$  and  $N > 100$ ) and Cronbach's alpha for each identified factor had to be between .70 and .95.
4. Test-retest reliability: Barker and colleagues (2002) recommend test-retest reliabilities should be at least  $r = .70$  for this criterion to be fully met.
5. Convergent and discriminant validity, meaning the extent to which scores on a scale relate to other measures in a manner consistent with theoretically derived hypotheses. For this criterion to be met, Terwee and colleagues (2007) require that (i) specific hypotheses are formulated by the scale's authors about expected correlations and (ii) at least three quarters of results are in line with expectations. As the recommendations do not consider the strength of these correlations, the 'rules of thumb' of Barker and colleagues (2002) was referred to. The recommend that at least two correlations with theoretically related constructs were at least  $r = .50$  to demonstrate convergent validity, thus this is required for a score of 2 to be awarded.
6. Floor and ceiling effects, that is the number of respondents achieving the highest or lowest possible scores. A score of 2 could be awarded if no more than 15% of the sample should receive the top or bottom score on a scale.
7. Interpretability: how differences in scores on the measure can be interpreted, or the degree to which qualitative meaning can be attached to quantitative scores. Terwee et al. (2007) require means and SDs of scores from at least four relevant subgroups of participants to be reported (e.g. metacognition scores in males vs. females, people diagnosed with SSD vs. controls) and minimal important change defined. However, as minimal important change was arguably not entirely relevant to the measures in this review, consideration was instead given to whether the authors indicated how scale scores might be interpreted or how scores might indicate change consistent with a meaningful outcome.
8. Inter-rater reliability: This refers to the reliability of observations across raters on observational as opposed to self-report measures. Due to the inclusion of observational, semi-structured interview based measures, this factor was included and scored based on the suggestion of Barker, Pistrang and Elliott (2002) that acceptable reliability is indicated by  $r \geq 0.70$ . A score of 0 denotes that the standard was not attained or the value was not reported, a score of 1 when the standard was partially attained (such as on some but not all sub-scales) and 2 when the standard was fully attained for all sub-scales.

#### Appendix 1.4: References of Review Papers

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*and Mental Disease*, 200(2), 130–134.  
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<https://doi.org/10.1097/NMD.0000000000000291>

## Appendix 2.1: Submission Requirements for the Journal of Cognition & Emotion

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Please note that long quotations should be indented without quotation marks.

### Formatting and templates

Papers may be submitted in any standard format, including Word and LaTeX. Figures should be saved separately from the text. To assist you in preparing your paper, we provide formatting templates.

### References

Please use this reference guide when preparing your paper. An EndNote output style is also available to assist you.

Checklist: what to include

**Author details.** Please ensure everyone meeting the International Committee of Medical Journal Editors (ICJME) requirements for authorship is included as an author of your paper. Please include all authors' full names, affiliations, postal addresses, telephone numbers and email addresses on the cover page. Where available, please also include ORCiDs and social media handles (Facebook, Twitter or LinkedIn). One author will need to be identified as the corresponding author, with their email address normally displayed in the article PDF (depending on the journal) and the online article. Authors' affiliations are the affiliations where the research was conducted. If any of the named co-authors moves affiliation during the peer-review process, the new affiliation can be given as a footnote. Please note that no changes to affiliation can be made after your paper is accepted. Read more on authorship.

A non-structured **abstract** of no more than 200 words. Read tips on writing your abstract.

**Graphical abstract** (optional). This is an image to give readers a clear idea of the content of your article. It should be a maximum width of 525 pixels. If your image is narrower than 525 pixels, please place it on a white background 525 pixels wide to ensure the dimensions are maintained. Save the graphical abstract as a .jpg, .png, or .gif. Please do not embed it in the manuscript file but save it as a separate file, labelled GaphicalAbstract1.

You can opt to include a **video abstract** with your article. Find out how these can help your work reach a wider audience, and what to think about when filming.

up to 5 **keywords**. Read making your article more discoverable, including information on choosing a title and search engine optimization.



**Funding details.** Please supply all details required by your funding and grant-awarding bodies as follows:

*For single agency grants:* This work was supported by the [Funding Agency] under Grant [number xxxx].

*For multiple agency grants:* This work was supported by the [funding Agency 1]; under Grant [number xxxx]; [Funding Agency 2] under Grant [number xxxx]; and [Funding Agency 3] under Grant [number xxxx].

**Disclosure statement.** This is to acknowledge any financial interest or benefit that has arisen from the direct applications of your research. Further guidance on what is a conflict of interest and how to disclose it.

**Supplemental online material.** Supplemental material can be a video, dataset, fileset, sound file or anything which supports (and is pertinent to) your paper. We publish supplemental material online via Figshare. Find out more about supplemental material and how to submit it with your article.

**Figures.** Figures should be high quality (1200 dpi for line art, 600 dpi for grayscale and 300 dpi for color, at the correct size). Figures should be saved as TIFF, PostScript or EPS files. More information on how to prepare artwork.

**Tables.** Tables should present new information rather than duplicating what is in the text. Readers should be able to interpret the table without reference to the text. Please supply editable files.

**Equations.** If you are submitting your manuscript as a Word document, please ensure that equations are editable. More information about mathematical symbols and equations.

**Units.** Please use SI units (non-italicized).

### Using third-party material in your paper

You must obtain the necessary permission to reuse third-party material in your article. The use of short extracts of text and some other types of material is usually permitted, on a limited basis, for the purposes of criticism and review without securing formal permission. If you wish to include any material in your paper for which you do not hold copyright, and which is not covered by this informal agreement, you will need to obtain written permission from the copyright owner prior to submission. More information on requesting permission to reproduce work(s) under copyright.

### Disclosure statement

Please include a disclosure of interest statement, using the subheading "Disclosure of interest." If you have no interests to declare, please state this (suggested wording: *The authors report no conflicts of interest*). For all NIH/Wellcome-funded papers, the grant number(s) must be included in the disclosure of interest statement. Read more on declaring conflicts of interest.

## Appendix 2.2: Ethics Approval Letter

**WoSRES**  
**West of Scotland Research Ethics Service**

Dr Hamish McLeod  
1st Floor, Admin Building  
Gartnavel Royal Hospital  
1055 Great Western Road  
Glasgow  
G12 0XH



**West of Scotland REC 5**  
West of Scotland Research Ethics Service  
West Glasgow Ambulatory Care Hospital  
(former Royal Hospital for Sick Children Yorkhill)  
Dalnair Street  
Glasgow G3 8SW  
[www.nhsggc.org.uk](http://www.nhsggc.org.uk)

Date 20<sup>th</sup> December 2016  
Your Ref  
Our Ref  
Direct line 0141 232 1805  
E-mail WOSREC5@ggc.scot.nhs.uk

Dear Dr McLeod

**Study title:** Autobiographical memory functioning and response to inpatient treatment for people diagnosed with Schizophrenia Spectrum Disorders  
**REC reference:** 16/WS/0258  
**IRAS project ID:** 212196

The Research Ethics Committee reviewed the above application at the meeting held on 14 December 2016. Thank you for attending to discuss the application.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this favourable opinion letter. The expectation is that this information will be published for all studies that receive an ethical opinion but should you wish to provide a substitute contact point, wish to make a request to defer, or require further information, please contact the REC Manager Mrs Liz Jamieson, [WoSREC5@ggc.scot.nhs.uk](mailto:WoSREC5@ggc.scot.nhs.uk). Under very limited circumstances (e.g. for student research which has received an unfavourable opinion), it may be possible to grant an exemption to the publication of the study.

### **Ethical opinion**

The members of the Committee present gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below. .

### **Conditions of the favourable opinion**

The REC favourable opinion is subject to the following conditions being met prior to the start of the study.

- The Consent Form to be revised to make the tick boxes larger.

You should notify the REC once all conditions have been met (except for site approvals from host organisations) and provide copies of any revised documentation with updated version numbers. Revised documents should be submitted to the REC electronically from IRAS. The REC will acknowledge receipt and provide a final list of the approved documentation for the study, which you can make available to host

organisations to facilitate their permission for the study. Failure to provide the final versions to the REC may cause delay in obtaining permissions.

Management permission must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements. Each NHS organisation must confirm through the signing of agreements and/or other documents that it has given permission for the research to proceed (except where explicitly specified otherwise).

Guidance on applying for HRA Approval (England)/ NHS permission for research is available in the Integrated Research Application System, at [www.hra.nhs.uk](http://www.hra.nhs.uk) or at <http://www.rdforum.nhs.uk>.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of management permissions from host organisations.

#### **Ethical review of research sites**

The favourable opinion applies to all NHS sites taking part in the study taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

#### **Summary of discussion at the meeting**

##### **Social or scientific value; scientific design and conduct of the study**

The Committee asked you to describe autobiographical memory.

*You advised that this was really the capacity to recall events from their life which would then be used to generate a narrative about their life. It is broken down into three stages, i.e.*

*To think about their most recent episode of being unwell  
To recall their working adult life, adolescence, first job, moving out of the family home  
To recall early life – primary school, moving house etc.*

##### **Favourable risk benefit ratio; anticipated benefit/risks for research participants (present and future)**

The Committee asked how severe would the people with psychosis be that would be included in the study.

*You advised the you would work closely with the Ward Staff. People can vary from day to day, i.e. not good one day but better the next. The participants must be able to sit down and take part in the interview.*

The Committee asked how many days after admission would you hope to recruit these patients.

*You commented that this was a tricky question but hopefully within a week of admission.*

The Committee wondered whether patients who were detained or about to be detained under the Mental Health Act would be eligible to take part in the study.

*You advised that this would be assessed as patients in this category would not be automatically excluded.*

### Approved documents

The documents reviewed and approved at the meeting were:

Document	Version	Date
Covering letter on headed paper		30 November 2016
GP/consultant information sheets or letters [North East Sector]	2	16 November 2016
GP/consultant information sheets or letters [North West]	2	16 November 2016
GP/consultant information sheets or letters [South]	2	16 November 2016
Interview schedules or topic guides for participants	1	29 November 2016
IRAS Checklist XML [Checklist_30112016]		30 November 2016
Non-validated questionnaire [Rating of Clinical Change During Admission]	1	29 November 2016
Participant consent form [Clinician]	1	16 November 2016
Participant consent form	3	16 November 2016
Participant information sheet (PIS)	2	28 October 2016
Participant information sheet (PIS) [Clinician]	2	29 November 2016
REC Application Form [REC_Form_30112016]		30 November 2016
Research protocol or project proposal	10	16 November 2016
Summary CV for Chief Investigator (CI)		
Summary CV for supervisor (student research)		19 August 2016
Validated questionnaire [QPR]		
Validated questionnaire [PANSS]		
Validated questionnaire [MAS]		

### Membership of the Committee

The members of the Ethics Committee who were present at the meeting are listed on the attached sheet.

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

### After ethical review

#### Reporting requirements

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The HRA website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

### User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: <http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/>

### HRA Training

We are pleased to welcome researchers and R&D staff at our training days – see details at <http://www.hra.nhs.uk/hra-training/>

<b>16/WS/0258</b>
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<b>Please quote this number on all correspondence</b>
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With the Committee's best wishes for the success of this project.

Yours sincerely



**Liz Jamieson, REC Manager**  
**On behalf of Dr Stewart Campbell, Chair**

*Enclosures: List of names and professions of members who were present at the meeting*

*"After ethical review – guidance for researchers"*

Copy to: Ms Emma Jane Gault, University of Glasgow  
Ms Elaine O'Neil, R&D NHS Greater Glasgow and Clyde

**West of Scotland REC 5**

**Attendance at Committee meeting on 14 December 2016**

**Committee Members:**

<i>Name</i>	<i>Profession</i>	<i>Present</i>	<i>Notes</i>
Dr Stewart Campbell	Consultant Physician & Gastroenterologist (CHAIR)	Yes	
Dr Roddy Chapman	Consultant Anaesthetist	No	
Dr James Curran	GP	No	
Dr Judith Godden	Scientific Officer/Manager	No	
Dr Gillian Harold	Consultant Radiologist	Yes	
Mrs Naomi Hickey	Research Nurse	No	
Dr Gillian Kerr	Consultant Physician	Yes	
Ms Amanda Martin	Project Manager	No	
Professor Doreen McClurg	Reader	Yes	
Professor Eddie McKenzie	Statistician	Yes	
Canon Matt McManus	Parish Priest (Vice-Chair)	Yes	
Ms Janis Munro	Key Account Manager	No	
Mrs June Russell	Retired (Research Chemist)	Yes	
Mr Charles Sargent	Retired	No	
Dr Marcel Strauss	Consultant Radiologist	Yes	
Mrs Liz Tregonning	Retired (Special Needs Teacher) (Alternate Vice-Chair)	Yes	

**Also in attendance:**

<i>Name</i>	<i>Position (or reason for attending)</i>
Mrs Liz Jamieson	Committee Co-ordinator

## Appendix 2.3: Ethics Amendment Letter

**WoSRES**  
**West of Scotland Research Ethics Service**

Dr Hamish McLeod  
1st Floor, Admin Building  
Gartnavel Royal Hospital  
1055 Great Western Road  
Glasgow  
G12 0XH



**West of Scotland REC 5**  
West of Scotland Research Ethics Service  
West Glasgow Ambulatory Care Hospital  
(former Royal Hospital for Sick Children Yorkhill)  
Dalnair Street  
Glasgow G3 8SW  
[www.nhsggc.org.uk](http://www.nhsggc.org.uk)

Date 12<sup>th</sup> January 2017  
Your Ref  
Our Ref  
Direct line 0141 232 1805  
E-mail WOSREC3@ggc.scot.nhs.uk

Dear Dr McLeod

**Study title:** Autobiographical memory functioning and response to inpatient treatment for people diagnosed with Schizophrenia Spectrum Disorders  
**REC reference:** 16/WS/0258  
**IRAS project ID:** 212196

Thank you for your email dated 9<sup>th</sup> January 2017. I can confirm the REC has received the documents listed below and that these comply with the approval conditions detailed in our letter dated 20 December 2016

### Documents received

The documents received were as follows:

Document	Version	Date
Participant consent form	4	03 January 2017
Response to Additional Conditions Met [Email]		09 January 2017

### Approved documents

The final list of approved documentation for the study is therefore as follows:

Document	Version	Date
Covering letter on headed paper		30 November 2016
GP/consultant information sheets or letters [North East Sector]	2	16 November 2016
GP/consultant information sheets or letters [North West]	2	16 November 2016
GP/consultant information sheets or letters [South]	2	16 November 2016

Interview schedules or topic guides for participants	1	29 November 2016
Non-validated questionnaire [Rating of Clinical Change During Admission]	1	29 November 2016
Participant consent form [Clinician]	1	16 November 2016
Participant consent form	4	03 January 2017
Participant information sheet (PIS)	2	28 October 2016
Participant information sheet (PIS) [Clinician]	2	29 November 2016
REC Application Form [REC_Form_30112016]		30 November 2016
Research protocol or project proposal	10	16 November 2016
Response to Additional Conditions Met [Email]		09 January 2017
Summary CV for Chief Investigator (CI)		
Summary CV for supervisor (student research)		19 August 2016
Validated questionnaire [QPR]		
Validated questionnaire [PANSS]		
Validated questionnaire [MAS]		

You should ensure that the sponsor has a copy of the final documentation for the study. It is the sponsor's responsibility to ensure that the documentation is made available to R&D offices at all participating sites.

<b>16/WS/0258</b>	<b>Please quote this number on all correspondence</b>
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Yours sincerely



**Liz Jamieson**  
**REC Manager**

Copy to: *Ms Emma Jane Gault, University of Glasgow*  
*Ms Elaine O'Neill, NHS Greater Glasgow and Clyde*



## Appendix 2.4: Participant Information Sheet



### Invitation to Participate in a Research Project

#### Autobiographical memory functioning and recovery in psychosis

We would like to invite you to take part in a research study. Before you decide, you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Talk to others about the study if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

#### Who is conducting the research?

The research is being carried out by Ms Sarah Breustedt who is a Clinical Psychologist in training from the University of Glasgow. The research is being supervised by Professor Hamish McLeod from the University of Glasgow. Dr Laura Raymond, Dr Allison Blackett and Dr Ian Mark Kevan, who are all Consultant Clinical Psychologists, are supporting the research in inpatient psychiatric wards in NHS Greater Glasgow and Clyde.

#### What is the research about?

This study is designed to investigate autobiographical memory, which is how people remember events that have happened to them in their lives. In particular, we are looking at this with people who have been diagnosed with psychosis and have been admitted to inpatient mental health services. This kind of research will contribute to understanding of the needs of people with psychosis, and to developing new ways that aim to help people recover. The study is being undertaken as part of the fulfilment for an academic qualification (Doctorate in Clinical Psychology).

#### Who is being asked to take part?

We are asking people who are involved in currently inpatients in mental health services who also have a diagnosis of schizophrenia and other similar disorders, to take part in the study.

#### Why have I been asked to take part?

A member of the mental health team responsible for your care (e.g. Psychiatrist, Clinical Psychologist or Psychiatric Nurse) has suggested that you might be eligible to take part in this study.

#### What do you mean by the term “autobiographical memory”?

“Autobiographical memory” refers to a person’s memory of events that have happened in their own lives. These can be memories of specific events or of more general periods in a person’s life, such as childhood and growing up.

**What are you asking me to consent to?**

If you consent to participate, you will meet with a researcher on the ward to complete an interview and some memory tasks. The researcher will also look at your case notes to collect information about your age, diagnosis, duration of illness and medications. Also, a staff member who is involved in your care will provide information relating to your recovery.

**What does taking part involve?**

If you decide to take part in the study, you will be asked to:

Let the clinician who told you about the study know that you are happy to learn more about the study and they will pass your details to Sarah Breustedt who will visit you on the ward.

Sarah will give you more information about the study, answer any questions you have and if you still would like to take part, she will arrange an appointment time with you. The appointments will all take place in the inpatient ward where you are staying.

Before you begin the interview, Sarah will ask you to sign a consent form to say you agree to take part in the study

Your interview will last around one hour and will be an informal discussion followed by two short thinking tasks. Sarah will ask you some questions about your life before coming in to hospital and she will ask you about how you are feeling now, including any symptoms you are experiencing. She will also ask you to try two short tasks testing your memory and your ability to think about thinking

If you are happy to continue in the study, Sarah will arrange to meet with you again in around two weeks' time and you will repeat some of the tests. This session will be a bit shorter. If you aren't in the hospital anymore, Sarah will offer to meet you somewhere suitable, such as a local clinic. The cost of you travelling there by taxi or public transport will be paid for by funds from the University of Glasgow.

You will be able to take breaks during the sessions if you would like to and you can decide to stop participating in the study at any time. You don't have to give a reason for this.

The interviews will be audio-recorded and later written down but with information that could identify you removed. The interviews may prompt you to remember positive experiences as well as upsetting experiences but we will not deliberately ask you any embarrassing or upsetting questions. You do not have to discuss any of the experiences that come to mind if you do not want to.

**Will my information be confidential?**

All the information that you provide will be treated as confidential. This means that all the information will only be identified by a code and not by your name. We will keep all the information safe and anonymous. This means that it will not include your name, the names of other people, schools, or jobs that you may mention, or any other information which could identify you. Only the researcher who interviews you will hear the original recording. Once the interview is written down, the recording will be destroyed. Quotes from your interview might be included in the study when it is published, but these quotes will have any identifying information taken out and your real name will not be used so that no one (other than the researcher) will know that the quote is something you said.

With your permission, Sarah will inform the member of the mental health team who referred you that you are taking part in the study. If you share information that makes Sarah concerned for your safety or the safety of other people, she will have a duty to pass this information on to others involved in your care (e.g. your key-worker or psychiatrist). Sarah will always try to discuss this with you beforehand and explain why she is concerned.

Representatives of the study Sponsor, NHS Greater Glasgow and Clyde, may look at your identifiable personal information to ensure that the study is being conducted correctly. They are bound by the same confidentiality rules as Sarah, the research team and your care team.

### **What happens to the consent form?**

To ensure that your information is kept confidential and anonymous, the consent form will be kept separately from the transcribed interview and research forms, in a locked filing cabinet. This will be within the University of Glasgow premises in the department of Mental Health and Wellbeing.

### **What are the benefits of taking part?**

In general, research improves our knowledge of what people's difficulties are and what we can do to help people overcome these and improve people's lives. Your participation will help increase our knowledge and potentially improve treatment for others in the future. With your consent, we will share a summary of your assessment with your key worker or psychiatrist and this might contribute to your treatment plan by providing information about your memory and thinking.

### **Is there a downside to taking part?**

It is possible, but unlikely that the interview may prompt you to recall events that you might find upsetting. However, you will not be forced to discuss anything you do not want to and we do not expect you to become distressed by your participation in the study. Many previous studies have been done in this area and it is very rare for people to experience negative outcomes, having participated in these studies. If you do feel distressed, or have any concerns, you can contact Sarah, Hamish or your mental health team in order to access suitable support.

Participation will also use around 2 hours of your time, however the study has been designed to use the least amount of time possible.

### **What happens if I decide not to take part?**

Nothing will happen if you choose not to participate. It will not affect any treatment that you receive.

### **Can I change my mind?**

If you decide to take part, you are able to change your mind and withdraw from the study at any time, and you do not need to give a reason. This will not affect any aspect of your usual care.

### **What will happen to the results of the study?**

The results of the study will be reported in Sarah's Doctoral Thesis which as part of her Doctorate in Clinical Psychology degree. It is hoped that the overall results will be published in a medical journal and through other routes to raise awareness of the findings.

You will not be identified in any report or publication. You are welcome to receive a copy of the findings once the project is complete. Please tell Sarah if you would like this and provide an address to which a summary of the results can be sent to.

**Who is organising and funding the research?**

The University of Glasgow with support from NHS Greater Glasgow and Clyde.

**Who has reviewed the study?**

The study has been reviewed by the University of Glasgow and the West of Scotland Research Ethics Committee to ensure that it is safe and meets required standards.

**Can I speak to someone who is independent of the study?**

Yes. You can speak to Professor Thomas McMillan at the University of Glasgow (Tel: +44 (0)141 211 0354 or [thomas.mcmillan@glasgow.ac.uk](mailto:thomas.mcmillan@glasgow.ac.uk) ).

**What if there is a problem?**

If you have a concern with any aspect of the study, please speak to Sarah who will do her best to assist you.

Researchers Contact Details	
Dr Hamish McLeod Doctorate in Clinical Psychology Programme Director, Institute of Health & Wellbeing, University of Glasgow Administration Building, 1 <sup>st</sup> Floor Gartnavel Royal Hospital 1055 Great Western Road Glasgow G12 0XH Email: <a href="mailto:Hamish.McLeod@glasgow.ac.uk">Hamish.McLeod@glasgow.ac.uk</a> Tel: 0141 211 3922	Sarah Breustedt, Trainee Clinical Psychologist Institute of Mental Health & Wellbeing, University of Glasgow Administration Building, 1 <sup>st</sup> Floor Gartnavel Royal Hospital 1055 Great Western Road Glasgow G12 0XH Email: <a href="mailto:s.breustedt.1@research.gla.ac.uk">s.breustedt.1@research.gla.ac.uk</a> <a href="tel:01412110607">Tel: 0141 211 0607</a>

If you remain unhappy with the conduct of the study and wish to complain formally, you can do this through NHS Greater Glasgow and Clyde NHS Complaints by telephoning 0141 201 4500.

If you feel distressed following your participation in this study, you speak to your key worker: .....

**Thank you for taking the time to read this**

## Appendix 2.5: Participant Consent Form



### Autobiographical memory functioning and recovery in psychosis

#### CONSENT FORM

(Version 4.1, 22<sup>nd</sup> February 2017)

Chief Investigator: Dr. Hamish McLeod, Programme Director for Doctorate in Clinical Psychology and Senior Lecturer

Researcher: Sarah Breustedt, Trainee Clinical Psychologist

Local Lead Investigators: Dr Laura Raymond, Consultant Clinical Psychologist (North East Sector); Dr Allison Blackett, Consultant Clinical Psychologist (South Sector) & Dr Ian Mark Kevan, Consultant Clinical Psychologist (North West Sector)

Please carefully read each statement below and if you agree, write your initials in the box next to each statement.

- |   |                          |
|---|--------------------------|
| 1. I have read and understand the Participant Information Sheet dated.....(Version.....) for the above study.   | <input type="checkbox"/> |
| 2. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.  | <input type="checkbox"/> |
| 3. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected.                                    | <input type="checkbox"/> |
| 4. I understand that the interview will be recorded and transcribed, and that following transcription the original recording will be destroyed and all personal information will be removed from the transcription. | <input type="checkbox"/> |
| 5. I understand that a member of the research team will examine my case notes to obtain data about my occupation/education, diagnosis, duration of illness and medications.   | <input type="checkbox"/> |
| 6. I understand that a staff member involved in my care will be asked to give information about how I am doing on the ward.   | <input type="checkbox"/> |

Version 4.1

22<sup>nd</sup> February 2017

7. I understand that if I say anything that makes the researcher concerned about my safety or the safety of another person, this information may be passed onto a third party. I also understand that the researcher will attempt to discuss this with me, should this situation arise.

☐

8. I understand that remarks I make may be included in an anonymous form in reports about this research (please leave this blank if you do not consent to this)

☐

9. I agree to my Psychiatrist being informed of my participation in the study.

☐

10. I agree to take part in the above study.

☐

Name of Participant

Date

Signature

Name of Person taking consent

Date

Signature

Participant's Identification Number for this study:

### Invitation to Participate in a Research Project (Clinicians)

#### **Autobiographical memory functioning and response to inpatient treatment for people diagnosed with Schizophrenia Spectrum Disorders**

We would like to invite you to take part in a research study. Before you decide, you need to understand why the research is being done and what it would involve for you. Please take time to read the following information carefully. Talk to others about the study if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

#### **Who is conducting the research?**

The research is being carried out by Ms Sarah Breustedt who is a Clinical Psychologist in training from the University of Glasgow. Sarah is employed by NHS Greater Glasgow and Clyde. The research is being supervised by Dr Hamish McLeod from the University of Glasgow. Dr Laura Raymond, Dr Allison Blackett and Dr Ian Mark Kevan, who are all Consultant Clinical Psychologists, are supporting the research in inpatient psychiatric wards in NHS Greater Glasgow and Clyde.

#### **What is the research about?**

This study is designed to investigate autobiographical memory, which is how people remember events that have happened to them in their lives. In particular, we are looking at this with people who have been diagnosed with psychosis and have been admitted to inpatient mental health services. This kind of research will contribute to understanding of the needs of people with psychosis, and to developing new ways to help people recover. The study is being undertaken as part of the fulfilment of an academic qualification (Doctorate in Clinical Psychology).

#### **Who is being asked to take part?**

We are asking people who are currently inpatients in mental health services who also have a diagnosis of schizophrenia and other similar disorders, to take part in the study. We are also asking members of staff involved in participants care to take part in recruiting people to the study and in assessing their response to treatment.

#### **Why have I been asked to take part?**

You are a member of staff working in a ward where potential participants are being asked to take part in the study.

**What do you mean by the term “autobiographical memory”?**

“Autobiographical memory” refers to a person’s memory of events that have happened in their own lives. These can be memories of specific events or of more general periods in a person’s life, such as childhood and growing up.

**What are you asking me to consent to?**

If you consent to participate, you will be asked by Sarah to let her know if someone who might be able to take part in the study is admitted to the ward and Sarah may ask you to approach that person and tell them that there is a research study going on which they can take part in. If the person seems interested or willing to find out more about the research, Sarah will arrange a time to meet the person on the ward and you might be asked to introduce Sarah to the person.

You may be asked to make an assessment of participants’ recovery using a brief, validated scale. This scale was developed to provide a rating of response to treatment for people affected by psychosis. You will be asked to complete this brief assessment at two time points, near admission and near discharge. This should take no more than 15 minutes of your time in total.

**Will the information gathered be confidential?**

All the information provided by staff and patients will be treated as confidential. This means that all the information will only be identified by a code and all identifying details will be extracted at the earliest possible point in data collection. We will keep all the information safe and anonymous.

If participants share information that makes Sarah concerned about their safety or the safety of other people, she will have a duty to discuss this with the wider clinical team.

Representatives of the study Sponsor, NHS Greater Glasgow and Clyde, may look at identifiable personal information to ensure that the study is being conducted correctly. They are bound by the same confidentiality rules as NHS clinical staff.

**What happens to the consent form?**

To ensure that your information is kept confidential and anonymous, the consent form will be kept separately from the transcribed interview and research forms, in a locked filing cabinet. This will be within the University of Glasgow premises in the department of Mental Health and Wellbeing.

**What are the benefits of taking part?**

In general, research improves our knowledge of what people’s difficulties are and what we can do to help people overcome these and improve people’s lives. Your participation will help increase our knowledge and potentially improve treatment for people affected by psychosis.

With participants’ consent, Sarah will share a summary of the assessment with the key worker or psychiatrist and this might contribute to treatment planning by providing information about cognitive functioning.



**Is there a downside to taking part?**

Participation will take up approximately 30 minutes of staff time. However the study has been designed to use the least amount of time possible.

What happens if I decide not to take part?

Nothing will happen if you choose not to participate.

**Can I change my mind?**

If you decide to take part, you are able to change your mind and withdraw from the study at any time, and you do not need to give a reason.

**What will happen to the results of the study?**

The results of the study will be reported in Sarah's Doctoral Thesis which is part of her Doctorate in Clinical Psychology degree. It is hoped that the overall results will be published in a medical journal and through other routes to raise awareness of the findings. You will not be identified in any report or publication. You are welcome to receive a copy of the findings once the project is complete. Please tell Sarah if you would like this and provide an address to which a summary of the results can be sent to.

**Who is organising and funding the research?**

The University of Glasgow with support from NHS Greater Glasgow and Clyde.

**Who has reviewed the study?**

The study has been reviewed by the University of Glasgow and the West of Scotland Research Ethics Committee to ensure that it is safe and meets required standards.

**Can I speak to someone who is independent of the study?**

Yes. You can speak to Professor Thomas McMillan at the University of Glasgow (Tel: +44 (0)141 211 0354 or [thomas.mcmillan@glasgow.ac.uk](mailto:thomas.mcmillan@glasgow.ac.uk) ).

**What if there is a problem?**

If you have a concern with any aspect of the study, please speak to Sarah who will do her best to assist you.

Researcher Contact Details	
Dr Hamish McLeod Doctorate in Clinical Psychology Programme Director, Institute of Health & Wellbeing, University of Glasgow Administration Building, 1 <sup>st</sup> Floor Gartnavel Royal Hospital 1055 Great Western Road Glasgow G12 0XH Email: <a href="mailto:Hamish.McLeod@glasgow.ac.uk">Hamish.McLeod@glasgow.ac.uk</a> Tel: 0141 211 3922	Sarah Breustedt, Trainee Clinical Psychologist Institute of Mental Health & Wellbeing, University of Glasgow Administration Building, 1 <sup>st</sup> Floor Gartnavel Royal Hospital 1055 Great Western Road Glasgow G12 0XH Email: <a href="mailto:s.breustedt.1@research.gla.ac.uk">s.breustedt.1@research.gla.ac.uk</a> Tel: <a href="tel:01412110607">0141 211 0607</a>

If you remain unhappy with the conduct of the study and wish to complain formally, you can do this through NHS Greater Glasgow and Clyde NHS Complaints by telephoning 0141 201 4500.

Thank you for taking the time to read this

## Appendix 2.7: Participant Consent Form (Clinicians)



Institute of Health  
& Wellbeing



### **Autobiographical memory functioning and response to inpatient treatment for people diagnosed with Schizophrenia Spectrum Disorders**

#### **CLINICIAN CONSENT FORM**

**(Version 1, 16<sup>th</sup> November 2016)**

Chief Investigator: Dr. Hamish McLeod, Programme Director for Doctorate in Clinical Psychology  
and Senior Lecturer

Researcher: Sarah Breustedt, Trainee Clinical Psychologist

Local Lead Investigators: Dr Laura Raymond, Consultant Clinical Psychologist (North East Sector);  
Dr Allison Blackett, Consultant Clinical Psychologist (South Sector) & Dr Ian Mark Kevan,  
Consultant Clinical Psychologist (North West Sector)

Please carefully read each statement below and if you agree, write your initials in the box next to  
each statement.

1. I have read and understand the Participant Information Sheet (Clinicians)  
dated.....(Version.....) for the above study. ☐
2. I have had the opportunity to consider the information, ask questions and have had these  
answered satisfactorily. ☐
3. I understand that my participation is voluntary and that I am free to withdraw at any time  
without giving any reason, without my employment or legal rights being affected. ☐
4. I agree to take part in the above study. ☐

Name of Participant

Date

Signature

Name of Person taking consent

Date

Signature

Participant's Identification Number for this study:

## Appendix 2.8: Major Research Project Proposal

### Title

Autobiographical memory functioning and response to inpatient treatment for Schizophrenia Spectrum Disorders

Supervisor: Dr Hamish McLeod

Date of Submission: 08/02/2016

Word Count: 2782

### Introduction

There is an established body of evidence that identifies associations between psychotic disorders and various cognitive impairments, including over-general autobiographical memory and poor mentalizing (Watson et. al., 2012). There is fairly robust evidence that autobiographical memory (AM) is impaired in people diagnosed with schizophrenia or psychosis (Berna, et. al, 2015). However, the mechanisms underpinning impaired AM functioning in schizophrenia are not well understood (Wood, et. al., 2006). This relationship is likely to be clinically relevant; it is thought that these deficits may impact upon delivery of psychological therapy because the ability to recall specific life events and construct coherent narratives of experience is an important component of many therapeutic interventions.

Research has demonstrated biases in both latency and specificity of AM retrieval that are consistently associated with various psychopathologies. AM functioning commonly shows over-general recall, the tendency to give a general description of events despite instructions to describe specific life events. Over-general AM recall has been observed in people diagnosed with schizophrenia when compared to matched control participants without any current psychiatric diagnoses (Ricarte, et. al., 2014). One explanation for over-general memory (Williams, et. al., 2007; the CaR-FA-X model) suggests three key components: 1. capture and rumination, 2. functional avoidance and 3. Impaired executive control. The interaction between variables that may underpin AM impairment in schizophrenia requires further examination.

Over-general AM recollections that lack detail feel less proximal to the experience and can undermine a subjective sense of self (Tulving, 2002). Such recall may also lead to a reduced perception of agency and these memories are less easily distinguished from imagined events or dreams (Klein, 2001). This has implications for both the experience of schizophrenia and the impact these deficits may have on ability to participate in therapies that rely on the patient being able to think about their past experiences in some detail. Potheegadoo and colleagues (2014) present evidence that specific cueing can improve AM recall specificity in people diagnosed with schizophrenia, suggesting that remediation strategies may be possible in treating this cognitive deficit.

Further to this, there is evidence that poor mentalization in schizophrenia spectrum disorders varies with other aspects of functioning such as AM, symptom burden and neurocognitive status. The terms mentalizing, Theory of Mind and metacognition all refer to a persons ability to “think about thinking”, about both their own thoughts and those of others (Lysaker, DiMaggio, Buck, Carcione & Nicolo, 2007). Lysaker and colleagues (2007) identified an association with metacognitive deficits and neurocognitive deficit profiles. There has been some exploration of this with specific reference to AM functioning in

psychosis, multiple deficits in which are relatively established findings within the literature (DiMaggio & Semerari, 2001 & DiMaggio, Salvatore, Popolo & Lysaker, 2012). More focused and effective treatments must be developed to help people recover and this will be aided by improving understanding of the cognitive underpinnings of schizophrenia.

### Aims

This study will examine how changes in AM functioning relate to response to inpatient admission for people with schizophrenia spectrum disorders.

The primary research question concerns whether better recovery of AM functioning is associated with better quality of self and clinician rated recovery.

### Hypotheses

Based upon findings from the extant literature and from reported clinical observations, it is hypothesised that there will be a correlation between AM functioning and response to treatment.

We predict that improvements in AM recall specificity will be associated directly with clinician and self-rated recovery. This would be consistent with improved access to AM information leading to a more coherent self-narratives and ability to make sense of the experience. We also predict that patients with more mentalization ability, a proxy of metacognitive functioning, will demonstrate better recovery.

### Recruitment Procedures

Treating clinicians will identify acute ward inpatients that meet the study inclusion criteria and will provide them with verbal and written information about the study. If the person agrees to take part, the Trainee Clinical Psychologist will arrange to meet with them at the ward and go through informed consent procedures. If the person gives consent a further appointment date and time will be agreed at which testing will be conducted. It is estimated that the administration of the tests will take approximately 60 minutes in the first session and up to 40 minutes in the second. The tests will examine AM functioning (AMT), mentalizing (MAS-A), neuropsychological functioning (HSCT & BMIPB), symptom burden (PANSS) and the person's view of their recovery (QPR). At both testing sessions, the person's key worker will be asked to complete the Brenner Scale to provide a measure of their assessment of the person's recovery in terms of symptom remission. Testing will be conducted on NHSGGC psychiatric inpatient wards at Gartnavel Hospital and Leverndale Hospital.

### Inclusion Criteria

Participants recruited to the study must meet ICD diagnostic criteria for Schizophrenia Spectrum Disorder. Individuals recruited to take part in the study must also be able to communicate fluently in English.

### Exclusion Criteria

Participants must not have a diagnosis of a learning disability, dementia or another neurological condition that could confound the results. Neither can their symptoms or treatment disable them to such a degree that they cannot be considered to have capacity to provide informed consent to participate in the research procedures. However, capacity to make an informed decision about taking part in research will fluctuate over time so individuals will be given more than one opportunity to take part.

## Measures

The Autobiographical Memory Test (AMT: Williams & Broadbent, 1986) will be used to examine AM function. This test is based on Galton's cue word paradigm which uses lists of cue-words to stimulate memory recall (Galton, 1879). It has been widely used in the literature and has been found to be a reliable measure of AMT specificity in clinical populations (Griffith, Klein, Sumner & Ehlers, 2012).

The Brenner Scale of Clinical Change in Schizophrenia (Brenner Scale: Brenner et.al. 1990) will be used to measure the clinician's assessment of symptom remission. This scale asks clinicians to rate the level of symptom remission they observe in the person with psychosis from Level 1 – Clinical Remission to Level 7 – Severely Refractory. Each level on the scale is accompanied by a brief definition of its meaning in terms of response to antipsychotic medication and degree of supervision required in social, personal and vocational domains of functioning.

The Positive and Negative Symptom Scale (PANSS), which is widely used in the literature (Tsapakis, Dimopoulou & Tarazi, 2015) is a 30-item examining a range of symptoms observed in patients meeting diagnostic criteria for psychotic disorders. This measure will be administered in order to provide an assessment of overall symptom burden that can be subdivided into positive and negative symptoms.

The Metacognition Assessment Scale-Adapted (MAS-A: Semerari, et. al., 2003) has been adapted for use with individuals experiencing psychosis and has been extensively used in the literature (e.g. Lysaker, et. al., 2005). The MAS-A will be applied to transcripts from the Indiana Psychiatry Illness Interview (IPII: see Lysaker et. al., 2002 for paradigm). The IPII is designed to elicit a narrative from the individuals about themselves and about illness; it typically takes around 30 minutes to complete. This measure is unique "in that it produces a self-narrative in which specific metacognitive acts may appear spontaneously with minimal scaffolding by the interview's structure" (Lysaker et. al., 2010) which minimises cueing effects and therefore should produce a more accurate assessment of metacognitive capacity. The MAS-A is subdivided into four constructs, the first of which is Self Reflectivity which is briefly defined as the comprehension of one's own mental state, Understanding of Others Mind or the comprehension of other's mental states, Decentration which is the ability to understand that others have independent motives and Mastery which is the ability to employ one's own mental states in order to accomplish cognitive tasks or cope with psychological distress. Metacognition is thought to exist on a continuum of function therefore the MAS-A is scored on an ordinal scale with higher scores denoting greater complexity.

The Questionnaire on the Process of Recovery Scale (QPR) will be used to assess patient's perception of individual recovery (Neil, et. al., 2009). This instrument was developed in collaboration with service users in the UK and has been validated for use within a population with similar demographic characteristics and those individuals who are likely to be recruited to take part in this study. The QPR is a 22-item measure that is divided into intrapersonal factors and interpersonal factors. Neil and colleagues (2009) conducted an evaluation of the validity of the QPR and reported that it has good internal consistency, construct validity and reliability, and as such is suitable for use as a clinical and research tool to assess and promote recovery in psychosis.

The Hayling Sentence Completion Test (Burgess & Shallice, 1997) is a brief verbal test of executive functioning. The test consists of two sets of 15 sentences all of which have the last word missing. The first test yields a measure of response initiation speed and the second measures response suppression ability and thinking time. This test has been used in repeated measures designs (Wood, Brewin & McLeod, 2006) however effects of learning could not be excluded so conclusions about any observed improvements would be somewhat limited.

The Brain Injury Rehabilitation Trust (BIRT) Memory and Information Processing Battery will be used to provide a measure of general memory functioning. The BMIPB is an extension of the Adult Memory and Information Processing Battery and it provides a repeatable assessment of memory (recall and recognition) and speed of processing.

### Design

This research study employs a repeated measures design examining AM functioning and response to routine inpatient treatment. Data will be collected from a convenience sample of persons diagnosed with Schizophrenia Spectrum Disorder. Approximately 30 individuals will be recruited to take part in the study. All participants will complete the same battery of tests at T1 and the AMT will be administered at both testing sessions. At T2 clinicians will complete the Brenner Scale and participants will complete the QPR. If the participant agrees, at T2 neurocognitive tests and PANSS will also be repeated. Testing at T1 will take an estimated minimum time of 80 minutes. Testing at T2 will take a minimum of 20 minutes and up to 60 minutes if the participant consents to repeated symptom (PANSS) and neuropsychological testing (BMIPB).

Table 1: Assessment and Estimated Administration Time

Test	Administration time
AMT	15
Brenner Scale^	2
PANSS	30
IPII/MAS-A*	20
QPR^	5
HSCT*	5
BMIPB	10
Total:	87

\*This measure will be administered at T1 only

^This measure will be administered at T2 only

T1 testing will be conducted in Gartnavel and Leverndale acute inpatient wards. The researcher will attend clinical meetings on the wards or otherwise ensure that she facilitates communication between herself and treating clinicians so that when a participant is nearing discharge from the ward T2 testing can be administered. If the participant is discharged before T2 testing can be carried out, the researcher will arrange an outpatient appointment with the participant and will provide transport by taxi to that appointment. Outpatient facilities are available at the Leverndale ward and use of them

has been provisionally agreed but contingencies for Gartnavel ward have yet to be identified.

### Data Analysis

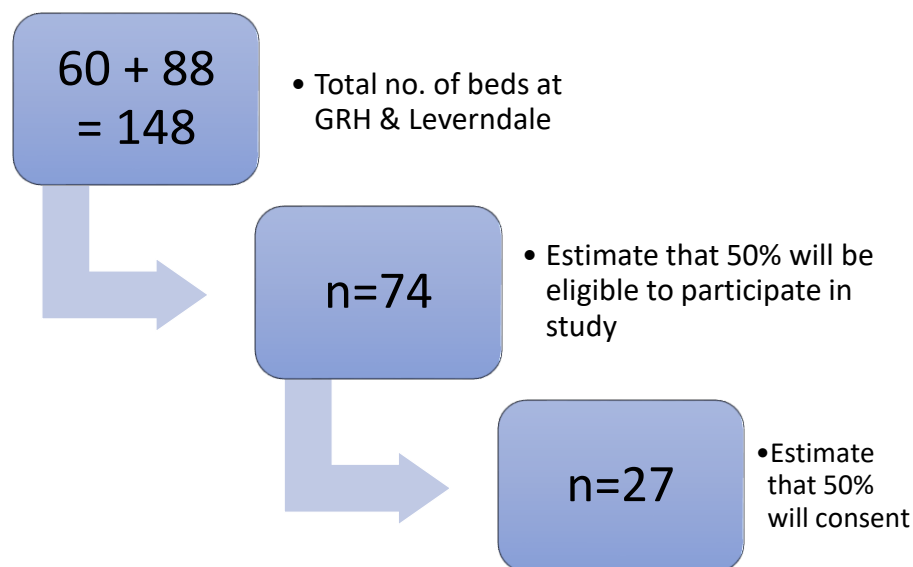
The first stage of data analysis will test for a correlation between AMT score and Brenner Scale rating over time. AMT specificity at both time points will be calculated using a paired-samples t-test.

Further descriptive analysis will be conducted to explore scores on measures of mentalizing, symptom burden, neuropsychological functioning and perception of recovery both over time and between the groups.

### Justification of Sample Size

Within the resources available it is estimated that 30 participants can be recruited; if an average of five participants are recruited per week, six weeks of recruitment will yield a sample of 30 participants. If a third are lost to follow up then repeated measures analysis will be applied to a sample of 20 people and the 10 remaining data sets will be analyzed for descriptive purposes. This would be achievable within 12 to 14 weeks with a testing interval of two weeks. Data collection could be carried out between January and April 2017.

Diagram 1: Estimated Recruitment Flow Chart



A previous study (McLeod, unpublished data) using a similar paradigm and sample size (repeated measures  $n=20$ ) reported small to medium effect sizes for the difference in AMT specificity score and the target sample size is based upon this precedent.

### Health and Safety Issues

#### Risks:

The risks to participants and the Trainee Clinical Psychologist will not be greater than those present in routine clinical practice. The Trainee will follow NHS Health and Safety protocols at all times.

#### Burdens:

There will be additional burdens placed on participants in the research due to the completion of measures that would not be used as part of routine assessment or treatment. Completing the assessment battery is likely to take approximately 100 minutes in total, over two sessions. However, being involved in contributing to the understanding

and treatment of psychosis may be considered a possible benefit for the individual (it may feel empowering) and the results of the neuropsychological assessment may be used to inform the person's treatment. In addition, travel costs for attendance at the second testing session will be paid for participants who are discharged before follow up is completed.

#### Ethical Issues

Should participants experience distress (e.g. recall of trauma), this will be responded to by the Trainee Clinical Psychologist in the same manner as when this occurs within a clinical session and the person may be offered a break or to stop the assessment. The Trainee Clinical Psychologist will also be able to notify ward staff of difficulties and ensure that information pertaining to the person's wellbeing is shared with relevant staff. NHS procedures will be followed if any criminal, or other, disclosure occurs during the study.

#### Settings & Equipment

The research will be conducted in NHS psychiatric inpatient settings. Hard copies of the BIRT Memory Impairment and Processing Battery and Hayling Sentence Completion Test will be required and these will be borrowed from the University Department or local Mental Health Services.

#### Financial Resources

Photocopying, printing and a digital voice recorder will be borrowed from the University. A bid for £150 of research funding will be made to the Institute for Health and Wellbeing in order to pay for participant transport to outpatient services for follow up testing at T2.

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