

Can Cognitive Insight predict recovery from psychosis in a first-episode cohort?

Jennifer O'Connor,

June, 2015.

Submitted in partial fulfilment of the requirements for the degree of Doctor in Clinical Psychology (DClinPsy), Royal Holloway, University of London.

Acknowledgements

I would firstly like to thank every research participant who generously shared their time, energy and personal experience to make this research possible. I'd also like to thank all my hardworking GAP colleagues for their contribution to this work; it has been a pleasure working with you over the years, and I am grateful that so many of you have become dear friends.

Thank you Professor Tony David for agreeing to continue to supervise my research as I began clinical training. Your good natured guidance and expertise has been greatly valued. A special thanks also to Dr Lyn Ellett, for providing such vital academic assistance; this thesis would not have been possible without your input.

To fellow doctorate student Oliver Schauman thank you for providing much needed advice and assurance during particularly stressful moments during my analysis. And to my Olly, thank you for providing me with love and encouragement throughout the entire process.

Abstract

Recovery from first episode psychosis (FEP) is heterogeneous and level of cognitive impairment at illness onset may explain later recovery (symptom severity and functional disability). Poor ability to self-reflect (a meta-cognitive impairment) and over-confidence in judgement (a reasoning bias) are associated with greater symptom severity in FEP. However, the relationship between these higher-order cognitive constructs and recovery over time is unclear. It was hypothesised that good Cognitive Insight (high self-reflectiveness and low self-certainty) would predict better medium-term recovery (five years) after the onset of psychotic illness. An additional interest was whether Cognitive Insight would predict recovery status after accounting for other cognitive variables (Jumping to Conclusions: JTC bias and IQ). FEP participants (n= 111) completed the Beck Cognitive Insight Scale (BCIS) at illness onset, and associations between BCIS scores and symptom and functional recovery 12 months and five years later, were assessed. Cognitive Insight did not predict recovery in this study. Rather, only aspects of the BCIS scale that indexed meta-cognition (self-reflection items) predicted symptom recovery at five years, whereas reasoning processes (self-certainty items) were not associated with symptom recovery. No aspect of cognition in this study predicted functional disability. Significant correlations between the JTC bias, self-certainty and IQ were found, which suggests a neuropsychological basis to reasoning processes, separate to meta-cognitive ability. Psychological interventions should focus on increasing self-reflective capacity rather than correcting reasoning bias to reduce symptom severity in psychosis.

INTRODUCTION	9
Overview	9
Psychosis and Illness Course	10
Classifications	10
Incidence and prevalence	11
Causes and maintaining factors	12
Prognosis	13
How is recovery measured?	14
Why track recovery from the first-episode?	17
Predictors of recovery	18
<i>Symptom profile at onset</i>	18
<i>Demographic Factors</i>	19
<i>Predictor Models of Recovery</i>	20
Cognition in Psychosis	21
An Integrative Cognitive Model	24
Lower-order Cognition	27
<i>IQ and Recovery</i>	28
Higher-Order Cognition	29
Meta-Cognition	30
<i>Self-Reflection and Recovery</i>	32
Reasoning Style: Confidence in Judgement	34
<i>The 'Jumping to Conclusions' Bias</i>	35
<i>Self-Certainty</i>	38
<i>Confidence in Judgement and Recovery</i>	39
Cognitive Insight	41
<i>Cognitive Insight and recovery</i>	43
Summary of section	45
Rationale for Current Study	45
Study Hypotheses	47

METHOD	49
Design	49
The current study	49
The broader GAP project context	49
The author’s role in the GAP project	50
Service-user involvement	50
Participants	52
Inclusion Criteria	52
Measures	53
Global Assessment of Functioning: GAF	53
Number of inpatient admission days	55
The Positive and Negative Syndrome Scale: PANSS	55
Diagnoses	57
The Beck Cognitive Insight Scale: BCIS	57
The Probabilistic Reasoning Beads Task	59
The Wechsler Adult Intelligence Scale -Third Edition: WAIS III	60
Procedure	62
Recruitment	62
Time 0 assessment procedures	63
Time 1 and 2 follow-up assessment procedures	64
Debrief and study completion procedures	66
RESULTS	67
Overview	67
Data Screening	67
Outliers	67
Distributions	68
Missing data	69
Sample Characteristics	70
Response Rate and Attrition	70
Sample demographics	74

Sample clinical characteristics	76
Sample cognitive characteristics	79
Follow-up Data Quality.....	80
Inter-Rater Agreement	80
Correlation Analysis	83
Identifying confounder variables.....	85
Relationships between cognitive variables.....	85
Main Findings	86
Hypothesis 1	86
Hypothesis 2	89
Hypothesis 3	91
<i>Changes to GAF ratings across time</i>	<i>91</i>
<i>BCIS correlations with recovery across time.....</i>	<i>92</i>
DISCUSSION	95
Overview	95
Hypothesis 1.....	95
Theoretical context of findings.....	98
Hypothesis 2.....	99
Theoretical context of findings.....	102
Hypothesis 3.....	103
Cognitive Insight and functional change over time.....	103
Cognitive Insight and symptom change over time	104
Theoretical context of findings.....	105
Study Limitations.....	106
Sampling and Generalisability.....	106
Follow-up procedures	108
Providing a neuropsychological context	110
Accounting for other predictor variables.....	111
Definitions of Recovery.....	112
Measurement Issues.....	113

Clinical Implications.....	114
Measuring self-reflective capacity to tailor psychological treatment.....	114
Self-reflection as treatment target in CBTp.....	117
Service delivery to target functional impairment	120
Future Research.....	122
Investigating self-reflection and CBTp relevant variables	122
Tracking self-reflection change over time	123
Manipulating self-reflection in an intervention study	124
Validation of the BCIS self-reflection scale	124
Conclusion	125
 REFERENCES _____	 127
 APPENDICES _____	 161
Appendix A.....	162
Appendix B.....	166
Appendix C.....	167
Appendix D	169
Appendix E.....	171
Appendix F	172
Appendix G	174

LIST OF FIGURES

Figure 1: Cognitive constructs relevant to psychosis.	23
Figure 2: Timeline for the collection of measures.	62
Figure 3: Flowchart indicating follow-up methodology and attrition rate	71

LIST OF TABLES

Table 1: Comparison of the Time 2 sample vs. sample missing at follow-up	73
Table 2: Socio-demographic information.....	75
Table 3: Clinical characteristics of the sample.....	78
Table 4: Descriptive data for cognitive measures	80
Table 5: Inter-rater agreement for GAF ratings from psychiatric clinical records.....	82
Table 6: Correlation Matrix.....	84
Table 7: Hierarchical regression to predict symptom severity at Time 2	88
Table 8: Hierarchical regression to predict function at Time 2	90
Table 9: Cohort's mean GAF symptom and function scores during the study	91
Table 10: Pearson's correlations between BCIS subscales and GAF ratings.....	94

INTRODUCTION

Overview

This chapter provides the theoretical and empirical framework for the research project. Following a brief explanation of psychosis, the rationale for studying recovery in psychosis from the first episode (FEP) and examining different aspects of recovery (symptom severity and general function) is provided. It is suggested that cognition at the onset of psychosis can predict both symptom and functional recovery. The cognitive constructs under investigation in this study are classified under two levels of processing: *lower-order* cognition, which is examined through the construct of general intelligence (IQ), and *higher-order* cognition: including meta-cognition and reasoning processes. The cumulative effect of two aspects of higher-order thinking (high self-reflection and low self-certainty) is thought to represent 'Cognitive Insight' (Beck & Warman, 2004). Cognitive Insight has never before been compared to other psychosis-relevant cognitive constructs such as the 'jumping to conclusions' (JTC) bias or IQ, as potential predictors of recovery in FEP. This research project has been designed to explore these relationships. To provide a context to this piece of research, the sections of this chapter are as follows: a) psychosis and illness course; b) cognition in psychosis; c) rationale for current study.

Psychosis and Illness Course

Classifications

Psychosis can be conceptualised as a family of illnesses characterised by an observable loss of contact with reality, which manifests in core symptoms including hallucinations, delusions and disorganised speech (DSM-V, American Psychiatric Association, 2013). In the current version of the International Classification of Diseases a number of diagnoses are grouped together as psychoses, including schizophrenia, schizotypal disorder, persistent delusional disorders, acute and transient psychotic disorders, induced delusional disorder, schizo-affective disorders, other non-organic psychotic disorders and unspecified non-organic psychosis (ICD-10, World Health Organization [WHO] 1992). Schizophrenia, which is the most commonly diagnosed of the psychoses (Kirkbride, *et al.*, 2006) is also the most frequently researched diagnosis of psychosis (Hegarty, Baldessarini, Tohen, Wateraux, & Oepen, 1994; McGlashan, 1988). Toward the end of the last century, researchers began classifying psychosis in terms of symptom *syndromes*, to suggest that not all psychoses experiences reflect one disease process. One important symptom distinction made by Crow (1980) and Andreasen and Olsen (1982) is between *positive* symptoms, which respond well to neuroleptic treatment (defined by a presence of aberrant behaviour i.e. delusions and hallucinations) and *negative* symptoms which are less responsive to neuroleptic treatment (defined by an absence of usual behaviour i.e. affective flattening, lack of movement, poverty of speech).

The notion that psychosis comprises of distinct, but correlated symptom dimensions that manifest differently in individual cases, is widely acknowledged (Andreasen, Arndt Alliger, Miller & Flaum, 1995; McGorry, 1995; Peralta, Cuesta & Farre, 1997; Verdoux & van Os, 2002). Confirmatory factor analysis supports the presence of positive, negative and mood dimensions (manic or depressive) across the entire psychosis spectrum (McGorry, Bell, Dudgeon & Jackson, 1998; van Os, *et al.*, 1999) and also across the general population (Stefanis, *et al.*, 2002). Proponents of the dimensional approach to psychosis suggest it is symptom frequency, severity, and associated distress (rather than presence or absence of these symptoms) that differentiates diagnoses and prognoses in psychosis (van Os, *et al.*, 1996; van Os, Linscott., Myin-Germeys, Delespaul & Krabbendam, 2009). As such, a dimensional classification of psychosis legitimises cohort research that samples across diagnoses to study symptom recovery (van Os, *et al.*, 1996).

Incidence and prevalence

The onset of psychotic illness occurs between childhood and middle ages, with peak rates in early adulthood (Kessler, Amminger Aguilar-Gaxiola, Alonso, Lee, & Ustun, 2007). Estimates of incidence and prevalence of psychosis tend to vary between demographic groups and geography, though it is generally accepted that the median prevalence of all clinically significant psychotic experience in the general population is around 5% (van Os, *et al.*, 2009). Lifetime prevalence rates of schizophrenia have been reported between 0.4% (Saha, Chant, Welham & McGrath, 2005) and 0.9% (Perälä *et al.*, 2007) and up to 3.48% for all psychotic disorders (Perälä *et al.*, 2007). The incidence rate of psychosis in the UK for people over 16 is

estimated at between 30 to 50 cases per 100,000 people per year (Cheng *et al.*, 2011; Kirbride, Stubbins & Jones 2012).

Causes and maintaining factors

No unitary cause of psychosis has been established to understand the psychosis experience, and a bio-psycho-social explanatory model is generally accepted (Engel, 1977). This model suggests that an interaction of many factors, of different natures, will contribute to the individual experience of symptoms and level of disability in psychosis. Somewhat akin to a fever, there are multiple pathways to and from the psychotic experience and understanding what factors contribute to different recovery pathways is the pursuit of modern explanatory models (Bürgy 2008; Van Os, *et al.*, 1996).

Advances in biological psychiatry research towards the end of the last century revealed much about the genetic and biological underpinning of psychosis (van der Gaag, 2006). It also positioned psychosis in a nosological dichotomy with explanatory models for neurotic disorders (which tend to emphasise the role of stress and life events) (Bürgy, 2008). In recent years however, researchers have begun to investigate the role of intra-psycho factors in the development and maintenance of psychotic disorder. This has led many to contest the distinction between psychotic symptoms and symptoms experienced in other emotional disorders (Freeman & Garety, 2003; Johns & Van Os 2001; Morrison, French & Wells, 2007). While medication remains the first line of treatment for psychosis (NICE guidelines, 2014) other treatments are emerging to reflect the psychological aspects of the psychosis experience. For instance, national guidelines in the UK now recommend 16 sessions

of individualised cognitive behavioural therapy for the treatment of psychotic symptoms (CBTp). This therapy is an adaptation of CBT for emotional disorders, and draws on cognitive models of psychosis to target specific thought processes hypothesised to maintain positive symptoms (Jolley, *et al.*, 2015). These guidelines have been recently updated to recommend that CBTp be offered at the earliest indication of psychotic symptoms, and at symptom relapse (NICE guidelines, 2014).

Prognosis

The illness course literature tends to portray a pessimistic view of prognosis in psychosis (Zipursky, Reily & Murray 2012). Psychosis was originally conceived as a 'premature dementia' which informed expectations that psychotic illness has a deteriorating illness course either with, or without partial intermittent remission (Kraepelin, 1919). Indeed many large scale longitudinal studies have suggested that it is usual for people with psychosis to endure multiple episodes of illness with increasing impairment (Huber, Naber & Lambert 2008; Shepherd, Watt, Faloon & Smeeton, 1989; Wiersma, Nienhuis, Slooff & Giel, 1998). Meta-analysis of 20th century research in psychosis suggests that the majority of patients with psychosis will *not* experience substantial improvement during the first six years of illness; however authors of this review concede that recovery rates in cohort studies are as much informed by diagnostic and recovery conceptualisations, as they are by illness related processes (Hegarty, *et al.*, 1994). For instance, illness course literature in psychosis has traditionally been built upon findings from 'schizophrenia only' or chronically unwell patient samples, wherein poor prognosis and enduring symptoms are imbedded into study inclusion criteria (American Psychiatric Association 1994; Lieberman, *et al.*, 2008). In contrast, studies investigating psychosis-spectrum

disorders portray a more optimistic illness trajectory (Bromet, Naz, Fochtmann, Carlson, & Tanenberg-Karant, 2005; Menezes, Arenovich & Zipursky, 2006) and schizoaffective patients have higher rates of symptom remission than those diagnosed with schizophrenia, five years after illness onset (Robinson, Woerner, McMeniman, Mendelowitz & Bilder, 2004). Given diagnostic differences, examining illness course across different diagnostic groups may provide a clearer indication of recovery rates from psychosis, and allow the investigation of common prognostic risk factors across the psychosis spectrum.

The illness course literature in psychosis has also been subject to other systematic bias, such as a failure to address the issue of missing data, which results in recovery outcomes of the very unwell or very well remaining unknown. Further, studies that follow the course of psychosis over time often recruit participants from restricted settings or treatment providers (i.e. inpatient only, or one local service provider) (Riecher-Rössler & Rössler, 1998). Another criticism levelled at studies that report on prognosis is that they do not account for multiple dimensions of recovery, and do not measure outcomes in a systematic, objective fashion (Hegarty *et al.*, 1994; Riechler-Rössler & Rössler, 1998). The reasons why it is important to account for multiple aspects of recovery will be outlined in the next section.

How is recovery measured?

Recovery has traditionally been defined in psychosis by response to pharmacological treatment (Kane, Honigfeld, Singer & Meltzer, 1988). However, as understandings of psychosis have broadened beyond a biological model, so too has the impetus to measure multiple types of recovery (Menezes, *et al.*, 2006; Mueser, *et al.*, 2002). Review of the illness course literature in psychosis suggests great

variability in the terminology and definitions used to measure recovery (Andreasen, *et al.*, 2005; Liberman, Kopelowicz, Ventura & Gutkind, 2002). However more recently, global and standardised clinical rating scales have been implemented to calculate a rate of recovery across time, and across studies (Menezes, *et al.*, 2006). For example, the Brief Psychiatric Rating Scale (BPRS: Overall & Gorham, 1962) and Global Assessment of Function (GAF: Endicott, Spitzer, Fleiss & Cohen 1976) are commonly used instruments to evaluate recovery rates in psychosis. Alongside a shift towards standardised measurement of recovery, attention is also increasingly paid to the study of non-symptom focused definitions of recovery (level of disablement in occupational and social roles suffered in psychosis populations) and other person-centred outcomes such as quality of life and social inclusion (Lieberman, *et al.*, 2008; Liberman & Kopelowicz, 2005; Slade & Hayward, 2007).

Psychopathology and functional disability domains of recovery are frequently shown to have separate course trajectories in psychosis (Liberman & Kopelowicz, 2005; Liberman, *et al.*, 2002). For instance, symptom trajectories stabilise early after the onset of illness, with 75-90% of individuals experiencing remission from positive symptoms after 12 months of treatment (Addington, Leriger & Addington, 2003; Liberman, *et al.*, 1993). However, symptom course is likely to fluctuate, and it has been estimated that 90% of individuals diagnosed with schizophrenia or schizoaffective disorder will experience symptom relapse within five years of illness onset (Robinson, *et al.*, 1999). On the other hand, a poor level of socio-vocational function is liable to endure long after the cessation of symptoms, and this pattern of differential recovery across symptom vs. function has been identified across the psychosis-spectrum (Conus, *et al.*, 2006; Robinson, *et al.*, 2004; San, Cuidad, Alvarez, Bobes, &

Gilaberte 2007; Singh, *et al.*, 2000; Tohen *et al.*, 2000). For example, in a sample of patients with major-affective disorder with psychotic features, Tohen *et al.*, (2000) reported that 63.1% of patients who were symptom free had not managed to return to pre-morbid living and working arrangements. The particular functional difficulties faced by patients after recovering from the acute phase of psychosis, include struggling to obtain financial independence (Ho, Nopoulos, Flaum, Arndt, & Andreasen, 1998; Stirling, *et al.*, 2003), maintain intimate relationships (Salokangas & Stengård, 1990) and friendships (Bertelsen, *et al.*, 2009; Harvey, Jeffreys, Mcaught, Blizard & King, 2007). A discrepancy between symptom and functional recovery has been found cross culturally (Barnes, *et al.*, 2008; Yamazawa, *et al.*, 2008) and has been shown to endure over time (Robinson, *et al.*, 2004). While functional aspects of recovery are thought to take a longer time than symptoms to improve, the level of functional disability in psychosis is expected to plateau by 5 to 10 years post illness onset and (unlike symptoms) remain relatively stable thereafter (McGlashan, 1988). This distinction between the trajectories of symptom and functional outcomes, suggests that the predictors of these recovery *types*, may also differ. Due to the instability of function in the early phase of illness, certain prognostic indicators of functional disability may only come to fruition many years after illness onset. Tracking predictors of different outcome domains across multiple time-points will clarify whether predictors of illness shift as a consequence of illness duration, and whether predictors differ across recovery *type*.

Why track recovery from the first-episode?

It has been suggested in this thesis that the illness course literature portrays an unrepresentative and pessimistic view of prognosis in psychosis (see prognosis section). A more epidemiological approach to studying the experience of psychosis is to sample across diagnoses, and *also* to study psychosis from illness onset. For instance, some patients will never become ill again after experiencing one episode of psychosis and these incidences (and associated protective factors) are often neglected in psychosis research (Riechler-Rössler & Rössler, 1998). In contrast to reports of prognosis in established psychosis (See prognosis section: Hegarty, *et al.*, 1994) a systematic review of 4,100 individuals with First Episode Psychosis (FEP) reported good overall recovery outcomes for 42% of this population (i.e. decreased number of hospitalisations, decreased symptom severity, higher rates of employment and more social inclusion), an intermediate outcome for 35%, and a poor outcome for only 27% of participants (Menezes, *et al.*, 2006).

The study of FEP samples has helped to identify early indicators of prognosis (Van Os, *et al.*, 1996). For instance Australian researchers propose a ‘clinical stage’ model of psychosis, which frames FEP as a critical phase in psychosis that can determine whether an individual will have milder clinical outcomes or suffer chronic illness progression (McGorry, Nelson, Goldstone & Yung, 2010). In agreement with what is known about symptom and functional recovery variability over time, a key feature of this clinical model is that prognostic indicators shift with illness progression. This is true of treatment options too, such that those interventions that are effective at illness onset may not be effective if initiated once illness progresses. Therapeutic input in the early stages of psychosis is thought to change illness

trajectories substantially (Birchwood, McGorry & Jackson 1997; McGorry, 1995) and many successful interventions have been designed on the basis of this model (Jackson & McGorry, 2010; McGorry, Yung, Bechdolf & Amminger, 2008).

Another advantage of conducting research with FEP samples is that one can examine illness onset characteristics before the secondary effects of psychosis (i.e. impact of disease, treatments or social consequences of having a serious mental illness) confound these variables interest (Lieberman, 1999; Riechler-Rössler & Rössler, 1998). To understand prognostic heterogeneity from psychosis, a challenge for research is to unpick *which* FEP variables predict outcome, *when* in the recovery pathway they become good prognostic indicators, and to identify *what* aspects of recovery they predict.

Predictors of recovery

In the following section, well-studied candidate FEP predictors of recovery are described. It is argued in this section that recognising the cumulative impact of these illness onset characteristics enables a more precise prognosis.

Symptom profile at onset

In line with a trend to study a dimensional classification of psychosis (see classifications section) a focus on the cross sectional examination of symptoms and associated recovery outcomes has emerged (Bleuler, 1950; van Os *et al.*, 1996). Overwhelming evidence suggests that a dominance of negative symptoms at illness onset accounts for poorer clinical and functional recovery *across* the psychosis-spectrum (Bertelsen *et al.*, 2009; Bodnar Malla, Jooper, & Lepage, 2008; Huber, *et al.*, 2008) and *within* schizophrenia-spectrum FEP samples (Milev, Ho, Arndt &

Andreasen, 2005; Lieberman, *et al.*, 2001; Ram, Bromet, Eaton, Pato & Schwartz, 1992). In contrast, acute positive symptoms at illness onset, have been found either to have no impact upon recovery outcomes (Malla, Norman, Mancanda & Townsend, 2002a), or even predict *better* symptom and functional recovery outcomes (Jablensky, *et al.*, 1992; McGlashan, *et al.*, 1988).

Demographic Factors

Demographic factors are commonly cited as predictors of recovery from FEP (Menezes *et al.*, 2006). For example, being female is found to predict better recovery (fewer hospitalisations, less severe symptoms and better vocational function) across the psychosis-spectrum (Häfner, Maurer, Löffler & Riecher-Rössler, 1991; Jablensky, *et al.*, 1992; Robinson, *et al.*, 2004; Salokangas & Stengard 1990; Shepherd, *et al.*, 1989). Inconsistent findings have been reported about age at onset of psychosis and recovery patterns, with some studies showing an association between earlier illness onset and worse recovery outcomes (Harrison *et al.*, 2001; Malla *et al.*, 2002b; Rabinowitz, Levine, & Häfner, 2006) although other similarly varied studies, showed no such associations (Garety, *et al.*, 1997; Wiersma *et al.*, 2000). The role of ethnicity in psychosis is complex and some conflicting relationships have been reported between ethnicity and recovery outcomes (Bhugra, *et al.*, 1997; McKenzie, *et al.*, 2001). For instance, one UK based long term follow-up study (18 years) found that Afro-Caribbean patients had significantly fewer negative symptoms than their white counterparts, though significantly greater use of mental health services (Takei, Persaud, Woodfruff, Brockington & Murray, 1998).

Predictor Models of Recovery

Given the complexity of psychoses presentations, it is unlikely that ‘good’ or ‘poor’ recovery outcome can be predicted based upon single predictor variables. Rather, different combinations of predictors tend to cluster together, to explain variability in recovery rates (McGlashan, 1988). Illness profiles at FEP are also influenced by factors present before the first symptoms of psychosis arise, and it has been put forth that psychosis onset is in one sense the end of a cumulative risk pathway (Dutta, *et al.*, 2007; Stilo, *et al.*, 2013). For instance, female gender and fewer symptoms at illness onset associate well with pre-onset predictors, such as shorter ‘duration of untreated psychosis’ (DUP) (Penttilä, Jääskeläinen, Hirvonen Isohanni & Miettunen, 2014; Malla, *et al.*, 2002b, Wiersma, *et al.*, 2000) and better pre-morbid functioning (Carlsson, Nyman, Ganse, & Cullberg 2006; Kay & Lindenmayer, 1987; Simonsen, *et al.*, 2007). Conversely, individuals who suffer insidious, negative symptom profiles at illness onset are more likely to be male, have poor pre-morbid functioning and have experienced a longer DUP (Malla *et al.*, 2002b; Malla & Payne, 2005). Examining relationships between illness onset variables within cumulative prognostic models (i.e. comparing these variables’ contribution to recovery outcomes) will elucidate whether an underlying disease process is responsible for driving the convergence of these variables, or whether these predictor variables are simply independent predictors of better life outcomes more generally (Riechler-Rössler & Rössler, 1998).

Impaired cognition has been forwarded as a disease-specific candidate, which underlies the relationship between illness-onset profiles and heterogeneous recovery outcomes in psychosis (Frith, 1992; Andreasen *et al.*, 2005). An advantage of

studying the role of cognition as a predictor of recovery is that unlike many other predictors of outcome, cognition represents a potentially modifiable factor (Bromet, *et al.*, 2005; Insel, 2010) and could be targeted *post* illness onset to improve prognosis. The relationship between cognition and different types of recovery outcomes in psychosis (symptom and general function) will be the focus of the next section of this chapter.

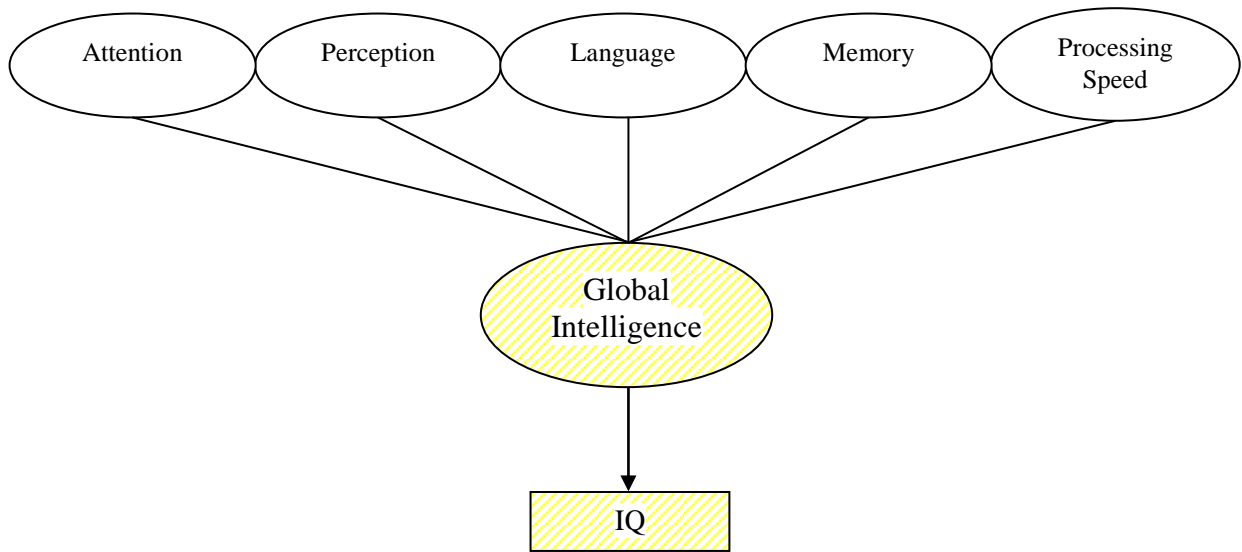
Cognition in Psychosis

Figure 1 displays the taxonomy of commonly researched cognitive constructs in psychosis. These constructs represent different *levels* of cognition (lower-order and higher-order). This conceptualisation is borrowed from a psychological learning and development model (Bloom, Engelhart, Furst, Hill & Krathwohl, 1956). According to this taxonomy, *lower-order* cognitive functions represent more basic and developmentally primordial cognitive functions, upon which *higher-order* cognitive functions are dependent (Evans, 2008). This conceptualisation of cognitive function assumes a hierarchical structure to the nervous system, such that lower-order functions must be intact before higher-order functions can be exercised (Larner, 2013). However, it is important to highlight that not all information processes in the brain can be mapped onto this dual level model, nor are cognitive constructs of this

nature entirely functionally distinct¹ (Evans, 2008). Nonetheless, this dual levelled conceptualisation felt appropriate and valuable to use in this thesis because it provides a neurobiological context, from which to make sense of the cognitive constructs compared in this thesis.

¹ There a lack of uniformity in the application of terms in cognitive research. For instance ‘higher-order’ is a term sometimes used to denote more complex functions carried out by lower-order domains such as language and visual-spatial perception (See Schoenberg & Scott, 2011), but this definitions is not used in this study.

Lower-order cognitive domains



Higher-order cognitive domains

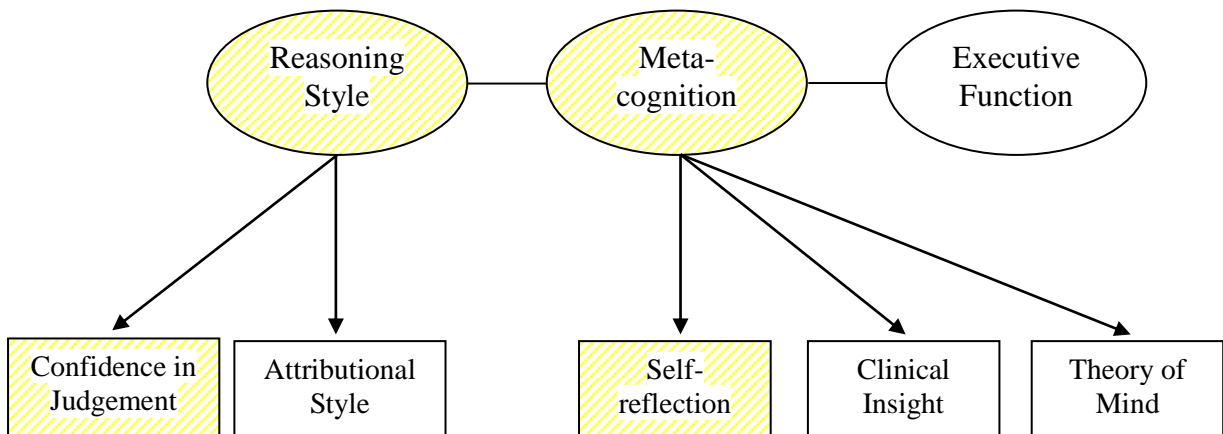


Figure 1: Cognitive constructs relevant to psychosis.

N.B. The cognitive domains and constructs of particular interest to this study are highlighted in yellow.

Cognitive constructs that can be classified as lower-order functions include memory, attention, language, spatial ability, motor skills and processing speed (Mirsky, 1969; Seidman, 1983; Gold & Harvey 1993). Higher-order mental phenomena can be understood in neurological terms as functions of the frontal lobes of the brain (Scott & Schoenberg, 2011; Shallice & Burgess, 1991) and are considered neurologically separate from lower-order cognitive variables (Strauss, Sherman & Spreen, 2006). In traditional neuropsychological assessment, higher-order cognitive constructs are considered ‘executive functions’ such as organisation, problem solving, sequencing and set-shifting (Evan, 2003). However, not all aspects of higher order thinking are well captured by traditional executive function tasks (Scott & Schoenberg, 2011). These other aspects of higher-order thinking include meta-cognition (*the ability to think about thinking*) and reasoning processes (*the process of making sense of an experience*). It is often these latter aspects of cognition that are the focus of change in psychological talking therapies (Moritz, *et al.*, 2014) although the extent to which these aspects of cognition are discrete and modifiable is still unclear (Garety, *et al.*, 2014). Cognitive theorists in psychosis accept that both lower-order and higher-order cognitive disturbances are implicated in the maintenance of psychosis over time, although which specific cognitive faculties are involved (or how to measure these) is contested (Corlett, Frith & Fletcher, 2009; Williamson, 2006).

An Integrative Cognitive Model

One seminal cognitive model explains the possible cognitive mechanisms through which positive symptoms of psychosis can be understood (Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001). The model is primarily focused upon higher-

order cognitive functions; it proposes that impaired meta-cognition underlies the risk for an individual to experience an aberrant cognitive event (i.e. often leading to hallucinations) and distorted or biased reasoning processes then influence whether such anomalous experiences are maintained over time, by virtue of how they are appraised (i.e. which may lead to enduring delusions). This model also acknowledges the role of what this author would understand as a *lower-order* cognitive disturbance in psychosis, namely poor sensory integration of moment to moment experience with stored memories (Hemsley, 1987; 1993). If this model is valid one may expect that aspects of cognition implicated in this model (lower-order cognition, meta-cognition and reasoning processes) to be impaired across the FEP population. Variability in the degree and nature of cognitive disturbance in FEP may explain heterogeneous recovery seen in this population.

Garety and colleagues' cognitive model is specific to cognitive predictors of 'positive psychotic symptoms' though it is unclear how these constructs relate to general psychopathology or indeed functional disability in psychosis. In the following review of the literature, an overview of lower-order and higher-order cognitive functions (as implicated in Garety's cognitive model) and empirical evidence linking these functions to psychosis is reported. Comprehensive literature review² suggests that certain lower and higher-order cognitive variables are more relevant to recovery from FEP than others, and only the most FEP relevant constructs will be examined in this thesis. These constructs include a well-accepted global index of lower-order abilities: general intelligence (IQ: Wechsler, 1939), the ability to self-reflect (a meta-cognitive construct) and 'confidence in judgement' (a reasoning process). The evidence relating these constructs to particular *types* of psychosis recovery (symptom and general function) will be reviewed.

² The following terms were entered into Medline and PubMed search databases: psychosis, cognition, neuropsychological, meta-cognition, reasoning, higher-order function, psychological factors, first-episode, thinking style. Limits were set so that only English language studies using new empirical data published was accessed. No limits were set on publication dates. These terms were searched in different combinations, e.g.) ((First episode psychosis AND meta-cognition-and symptoms) OR (first episode psychoses and neuropsychology and function)) papers were identified from their abstracts as relevant and a further relevant studies were identified through a citation search and cross referencing.

Lower-order Cognition

Lower-order cognition is defined as those cognitive functions that are different from cognitive functions of the frontal lobe (described here as higher-order cognition), and in comparison, represent less complex and earlier developed cognitive functions including memory, attention, language, sensory perception and processing speed (Mirsky, 1969; Seidman, 1983; Gold & Harvey 1993). Meta-analysis suggests that deficits in lower-order cognitive domains are commonly observed in schizophrenia disorders (Alward, Walker & Bettes 1984; Heinrichs & Zakzanis, 1998) with a rate of impairment reported between one to two standard deviations below control comparisons (Heinrichs & Zakzanis, 1998), even at first episode (Bilder *et al.*, 2000; Censits *et al.*, 1997; Rabinowitz, De Smedt, Harvey, & Davidson 2002; Riley *et al.*, 2000; Saykin, *et al.*, 1994). Lower-order cognitive impairment is also documented across the psychosis spectrum, although generally to a lesser extent (Reichenberg, *et al.*, 2009; Seidman *et al.*, 2002; Zanelli, *et al.*, 2010).

Lower-order impairment is often present in the childhood (Reichenberg, *et al.*, 2010) and prodrome phase (Fusor-Poli, *et al.*, 2012) of individuals subsequently diagnosed with schizophrenia. Upon transition to first episode these deficits are most pronounced (Eastvold, Heaton & Cadenhead 2007) where they become global (i.e. deficits found in multiple domains of lower-order function) and remain stable (Addington, Saeedi & Addington 2005; Rund, 1998; Russell, Munro, Jones, Hemsley & Murray 1997). A neuro-developmental account of psychosis suggests that psychosis illness is the manifestation of a neural injury between conception and early adulthood that becomes evident through brain maturation (Murray & Lewis 1987; Weinberger 1987) and impaired performance on lower-order neuropsychological tests

are purported to support the existence of this neural injury. However, no definitive pathological indicators in the brain have been found to support the exact nature of cognitive disturbance in psychosis (van der Gaag, 2006; Williamson, 2006). Indeed, not all individuals with psychosis show lower-order cognitive deficits (Palmer, *et al.*, 1997) and variation in cognitive function is especially evident at first-episode (Joyce, Hutton, Mutsatsa, & Barnes, 2005). These findings imply that lower-order cognitive deficits reflect only one type of psychosis trajectory (which is perhaps neuro-developmentally driven), and is plausibly associated with poorer recovery outcomes. Using IQ as a measure to index lower-order cognitive deficits is legitimate, as general intelligence has been shown to account for a significant proportion of individual difference in neurological disturbance across different population groups (Dreary, 2001).

IQ and Recovery

Poor intellectual function in psychosis is linked at least to some extent, with greater symptom severity, particularly negative symptoms (Breier, Schreiber, Dyer, & Pickar 1991; Moritz., *et al.*, 2000), whereas positive symptoms are consistently found to be unrelated to performance on lower-order cognitive tasks (Basso, Nasrallah, Olson, & Bornstein, 1998; Keefe, *et al.*, 2006). There is substantially better evidence linking IQ to real world functioning such as employment and social disability (Green, 1996; Green, Kern, Braff, & Mintz, 2000; Green, Kern, & Heaton, 2004). Green and colleagues found that global intelligence is associated cross-sectionally with functional outcome (Green, 1996; Green, *et al.*, 2000) as well as prospectively (Green *et al.*, 2004). However systematic reviews by Green and colleagues have been based

mainly on a selection of studies using relapsing or chronically unwell participant samples.

Associations between IQ and recovery are less evident when examining cognition from the first episode, though there is some tentative evidence that IQ can predict medium-term (3 to 7 years) and long-term (7 to 13 years) functional outcome in FEP (Allott, Liu, Proffitt, & Killackey 2011). For example, IQ is a better predictor of social function and negative symptoms at four years after illness onset, than specific neuro-psychological features such as memory, processing speed or executive tasks (rule learning and set-shifting) (Leeson, Barnes, Hutton, Ron & Joyce, 2009). In another large FEP sample (n=115), higher IQ was shown to prospectively predict better socio-vocational status as rated by a general assessment of function (GAF) (Endicott, *et al.*, 1976) when compared to controls matched on education and age (Carlsson, *et al.*, 2006). In this same study, IQ at illness onset was not predictive of short-term (12 month) functional outcome, however, IQ became predictive at three year follow-up (Carlsson *et al.*, 2006). This finding supports the clinical stage-model theory, such that predictors of outcome may shift as illness progresses (McGorry, *et al.*, 2010).

Higher-Order Cognition

Higher-order mental phenomena relevant to psychoses can be understood in neurological terms as functions of the frontal lobes of the brain (Scott & Schoenberg, 2011; Shallice & Burgess, 1991). Two aspects of higher-order cognition are implicated in Garety, *et al*'s cognitive model (2001): meta-cognition and reasoning style.

Meta-Cognition

Meta-cognition can be understood broadly as the ability to *'think about thinking'* (Flavell, 1979). Impaired meta-knowledge is multifaceted and has been construed in a number of ways, including the investigation of one's awareness of their own psychosis, referred to as 'clinical insight' (David, 1990; David, 2004) and mentalisation of another person's experience: 'theory of mind' (ToM) (Frith & Corcoran, 1996). Parnas and Handest (2003) suggest that meta-cognition is a key process underlying psychosis; however, an under-evaluation of subjective experience in modern psychiatry may have stunted the growth of this field in the past, compared with the study of neuro-psychologically measured cognition (Andreasen, 1997; Burgy, 2008; Parnast & Handest, 2003). However, the psychological research of Christopher Frith and colleagues in the 1980s to 1990s suggested an important relationship between impaired meta-cognition and psychotic symptoms. Their experimental research found that compromised meta-cognition accounted for a wide selection of symptom presentations in psychosis including: a) disorders of "willed action" (e.g., negative and disorganized symptoms); b) disorders of self-monitoring (e.g., delusions of alien control and voice-commenting hallucinations or other "passivity" symptoms); and c) disorders of monitoring other persons' thoughts and intentions, including delusions of reference and persecution (Blakemore, Smith, Steel, Johnstone, & Frith, 2000; Franck, *et al*, 2001; Frith, 1992). An association between clinical insight and ToM, with poorer recovery outcomes in psychosis has been found (Fett, *et al.*, 2011; Rosen & Garety, 2005; Ventura, Wood, & Helleman, 2011). However poor clinical insight and impaired ToM are often seen in the context of lower-order cognitive impairments (Frith & Corcoran, 1996; Garety & Freeman, 1999; Harrington, Seigert

& McClure 2005; Keshavan, Rabinowitz, DeSmedt, Harvey & Schooler 2004). Lack of clinical insight and poor ToM is also most prevalent in schizophrenia-spectrum disorders (Amador, *et al.*, 1994; Bora, Yucel & Pantelis 2009; Brune, 2005; Mintz, Dobson & Romney, 2003; Sprong, Schothorst, Vos, Hox & Van Engeland 2007). These associations with lower-order cognition and schizophrenia-spectrum diagnoses suggest that these constructs are less central to the cognitive aetiology of FEP (which is diagnostically and cognitively more varied).

Another aspect of meta-cognition that is of key interest to this study is the ability to assess the correctness of one's knowledge. A common way to conceptualise this construct, is the ability to be accurately introspective, and recognise one's own subjective fallibility (Koren, Seidman, Goldsmith & Harvey, 2006). The process of self-introspection is distinct from other cognitive constructs, which makes it a valuable construct to measure in its own right. Meta-analysis of brain structural studies demonstrates a clear distinction in activation patterns for self-reflection vs. reflecting upon other people's thoughts (social cognition/ ToM), or reflecting upon an external problem (belief flexibility) or flexible problem solving (i.e. executive function measured tasks) (van der Meer, Costafreda, Aleman & David, 2010). Unlike other meta-cognitive concepts (clinical insight and ToM), self-reflection has few neural correlates with lower-order cognition (Nair, Palmer, Aleman & David, 2014) and has been put forth as an ecologically valid predictor of recovery from psychosis (Koren, *et al.*, 2004; Koren, *et al.*, 2006). For example, take two people with the same poor planning ability; the individual that has awareness of their cognitive difficulties may not go ahead with their faulty plan, and subsequently may have better outcomes than the individual that lacks this 'meta knowledge' (Koren, *et al.*, 2006).

One tool which purports to index self-reflection is ‘The Beck Cognitive Insight Scale’ (BCIS: Beck, Baruch, Balter, Steer & Warman, 2004). This instrument contains two self-report scales, one of which is a 9 item self-reflective scale that requires individuals to rate their endorsement of items such as “*if somebody points out that my beliefs are wrong, I am willing to consider it*” or “*even though I feel strongly I am right, I could be wrong*”. When individuals endorse these items strongly, they are exercising two important meta-cognitive functions: the expression of introspection, and a willingness to acknowledge fallibility (Beck, *et al.*, 2004). It has been reported that individuals with psychosis endorse fewer self-reflective behaviours (agree less with these BCIS items) compared with non-psychotic psychiatric patients (Beck *et al.*, 2004) and non-psychiatric controls (Warman & Martin, 2006; Wiffen, 2011).

Self-Reflection and Recovery

Whether the BCIS self-reflective measure is associated with recovery outcomes in psychosis is a new and burgeoning area of research (Riggs, Grant, Perivoliotis & Beck, 2012). Some findings suggest that self-reflective capacity is particularly relevant to delusional experience. For instance, in the BCIS scale publication study (Beck, *et al.*, 2004), self-reflective capacity was inversely associated with delusional severity across different diagnostic groups. In a different schizophrenia-spectrum sample (n= 143) greater self-reflection was associated cross-sectionally with reduced delusional experience (Engh, *et al.*, 2010). This relationship has also been found in a psychosis-spectrum FEP sample (Buchy, Malla, Joober & Lepage, 2009). In contrast, one study compared delusional and non-delusional patients to show the opposite of theoretical expectations: those with delusions actually

showed *higher* self-reflective capacity (Warman, Lysaker & Martin, 2007). However Warman and colleagues' use of a chronic and poorly represented (n=13) non-delusional comparison group has been criticised (Buchy, *et al.*, 2009) and may explain this anomalous finding. Whether self-reflective capabilities can predict *later* delusional symptoms is unclear as there are very few prospective studies investigating the unique role of self-reflection and symptom recovery in psychosis. In an acute inpatient psychosis sample (n=30) self-reflection was not stable across time (30 days) and was unrelated to later symptom severity at discharge (Bora, Erkan, Kayahan, & Veznedaroglu, 2007). However, in a larger study that used a less acute outpatient psychoses sample (n=78) self-reflective capacity (as measured by the BCIS) was correlated with fewer delusional symptoms eight months later (Perivoliotis, Grant, Peters, Ison, Kuipers, & Beck 2010).

Studies that have examined associations between self-reflective capacity and other types of psychopathology in psychosis have produced mixed findings. For instance, multiple studies have found strong correlations between a high BCIS self-reflective score and *increased* depression (Belvederi-Murri, *et al.*, 2015; Colis, Steer & Beck, 2006; Ekinici, Ugurlu, Albayrak, Arslan & Caykoylu, 2012; Warman, *et al.*, 2007) and *reduced* negative symptoms (Bora, *et al.*, 2007; Tranulis, Lepage & Malla, 2008). The relationship between self-reflection and hallucinations is not clear, and requires more research (Bora *et al.*, 2007; Warman, *et al.*, 2007). The relationship between self-reflection and functional recovery has rarely been examined a priori. However, in one study based on an established psychosis sample (n=152), individuals with greater self-reflection scores on the BCIS were significantly more likely to be

living independently than participants with low-self-reflectiveness (Favrod, Zimmermann, Raffard, Pomini & Khazaal, 2008).

In summary, the research to date that has examined the relationship between the BCIS self-reflection scale and recovery in psychosis has mainly been cross-sectional and conducted with established psychosis patients. What is unclear is whether self-reflection is a useful predictor of prospective recovery in an FEP sample.

Reasoning Style: Confidence in Judgement

Another key feature of Garety's cognitive model is the implication of reasoning processes in symptom maintenance (Garety, *et al.*, 2001). In psychosis research, reasoning biases are described as cognitive *distortions* rather than cognitive *deficits*, which is similar to conceptualisations used in explanatory models for emotional disorders (Beck & Clark, 1997; Clark & Wells, 1995; Beck 2002). A distorted or biased reasoning *style* is suggested to influence how an individual appraises causality (Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001; Morrison, Haddock & Tarrier, 1995) or casts judgement (Garety, Hemsley & Wessley 1991). A rigid and closed reasoning style may for example manifest in 'over-confidence in judgement' (Huq, Garety & Hemsley, 1988). Over-confidence in judgement is thought to be particularly relevant to the experience of enduring positive psychotic symptoms (delusions and hallucinations) such that it leads to premature and irrational explanations for experiences and makes individuals less likely to seek support from mental health services (Huq, *et al.*, 1988). 'Over-confidence in judgement', and has been found to be qualitatively separate from another well studied

reasoning bias: an externalising attributional style (Moritz, *et al.*, 2010). One method of measuring ‘confidence in judgement’ is described next.

The ‘Jumping to Conclusions’ Bias

The ‘Jumping to Conclusions’ or JTC bias, is measured by the behavioural response to a probabilistic reasoning paradigm called ‘The Beads Task’ (Huq, *et al.*, 1988). In one version of this task, participants are shown two jars that contain coloured beads (orange or black). Each jar contains beads in a different proportion, e.g. one jar contains 85 black and 15 orange beads, and the other jar contains the reverse proportion. Participants are informed of and shown the coloured bead proportions, before the containers are removed from their view. Participants are then told that each jar (either the jar containing mainly orange beads or the jar containing mainly black beads) has the same probability of being chosen by the researcher (50:50) and that beads will be extracted from the selected jar and shown to participants one at a time. It is the participant’s task to decide from which of the two jars the beads are being taken, whether it is the mainly orange or the mainly black jar. They are told that they should only decide when they are certain. There is a more difficult version of the Beads Task also in common use, in which two jars containing coloured beads are presented at a 60:40 ratio (Dudley, John, Young, & Over, 1997).

The general population tend to apply over cautious data gathering (rather than logical reasoning) in their completion of the Beads Task (i.e. request to see more beads than statistically necessary to be reasonably certain they have selected the correct jar) (Phillips & Edwards, 1966). However, psychosis populations tend not to exercise the same conservatism as the general population in their approach to this task,

and rather ‘jump to conclusions’ (i.e. select a jar in haste, before they can be reasonably certain their judgement is correct). At what threshold to define a JTC bias (i.e. Draws to Decision: DTD) is operationalised differently across studies (Fine, Gardner, Craigie, & Gold, 2007). In previous FEP studies, responding after seeing only one or two beads has been used to indicate a JTC bias (Dudley, *et al.*, 2011; Falcone, *et al.*, 2014).

A dose–response relationship between JTC and liability to psychosis appears to operate, such that deluded psychotic individuals show the highest rates of JTC bias, although the bias is still found in non-delusional psychosis samples (Bentham, *et al.*, 1996; Menon, Pomarol, Clotet, McKenna, & McCarthy, 2006; Moritz & Woodward, 2005) and is found more frequently in populations with a psychosis vulnerability (first-degree relatives) than in non-labile control populations (Lincoln, Ziegler, Mehl, & Rief, 2010; van Dael, *et al.*, 2006). In established psychosis the JTC bias has been shown to be stable over time (Peters & Garety, 2006; So, *et al.*, 2012) whereas in some other samples (including FEP) this bias is not consistently present across time (Menon, Mizrahi & Kapur, *et al.*, 2008; Ormrod, *et al.*, 2012; Woodward Munz, LeClerc, & Lecomte, 2009). Approximately 30-60% of people with psychosis spectrum disorders do *not* present with the JTC bias (Garety & Freeman, 1999) and so it is reasonable to speculate that this may be an important cognitive marker of recovery variance *within* patient samples. However, the JTC bias is not entirely psychosis-specific, and has also been found in a non-labile control population (i.e. healthy volunteers who endorse no psychosis-like thinking and do not have familial risk to psychosis) at a rate of 25% (Falcone, 2013). This suggests that caution is

warranted when using the JTC as an independent prognostic measure, given that its specificity to psychosis is questionable.

Some of the inconsistencies in research regarding ‘jumping to conclusions’ and its specificity to psychoses may be due to construct validity of the Beads Task. Indeed, it is widely recognised that the JTC reasoning style is influenced by both *state* and *trait* characteristics (Moritz & Woodward, 2005). Therefore, while the Beads Task instructs participants to choose a jar “*only once you are certain*”, there is no assurance that certainty or confidence is driving the behavioural response to this task. In reality, the response to the Beads Task is likely to also be influenced by multiple factors, such as need for closure (Colbert & Peters, 2002), personality (Bensi, Giusberti, Nori, & Gambetti, 2010), and state-anxiety levels (Freeman, 2007). Lower-order cognitive capacity is also implicated in response to this task, as many studies have found that a tendency to JTC is associated with poorer autobiographical memory (Moritz, Vitzthum, Randjbar, Veckenstedt & Woodward, 2010a) impaired working memory (Freeman, *et al.*, 2014) and lower IQ (Lincoln, *et al.*, 2010; van Dael *et al.*, 2006). For example, Lincoln and colleagues found that the association of the JTC bias with psychotic symptoms was rendered non-significant once IQ was controlled (Lincoln, *et al.*, 2010). In a study of psychosis and depression, Bentall, *et al.*, (2009) found that the lower an individual’s IQ score, the hastier the data-gathering style, a finding which was recently replicated in an FEP sample (Falcone, *et al.*, 2014). Indeed some researchers refer to the JTC bias as relatively ‘benign’, though they argue that in combination with lower-order cognitive impairment, this reasoning style may predict prognosis in psychosis (Moritz & Woodward 2007). Given the lack of clarity over the construct validity of the JTC bias, it may be useful to compare this construct with a

more *direct* measure of ‘confidence in judgement’. Such a measure is described below.

Self-Certainty

The self-certainty scale of The Beck Cognitive Insight Scale (BCIS, Beck *et al.*, 2004) is designed to be administered along with the self-reflective scale already discussed (see meta-cognition section). Much like the JTC bias, the self-certainty scale is designed to examine ‘confidence in judgment’ (Beck, *et al.*, 2004) and contains six items including “*if something feels right, it is right*” and “*I can trust my own judgement at all times*”. In the original publication of the BCIS instrument, the mean self-certainty score of inpatients with a psychosis diagnosis was significantly higher than the mean self-certainty score of inpatients without a psychosis diagnosis (Beck, *et al.*, 2004). Further, BCIS self-certainty scores are found to be higher in FEP (Buchy *et al.*, 2009) than in chronic psychosis samples (Warman *et al.*, 2007; Engh, *et al.*, 2010). One possible explanation for higher self-certainty scores in FEP than established psychoses is that confidence in judgement reduces with socialisation to medical model of psychosis. For instance, when someone receives treatment and support to understand their delusions, they may be better able to cast doubts on the certainty of their judgments (Moritz & Woodward, 2007). Warman and Martin (2006) found that delusion proneness in a student-non clinical population was significantly positively correlated with self-certainty, suggesting that, like evidence relating to the JTC bias, high scores on this scale may signal vulnerability to psychosis (Colbert & Peters; 2002; Lincoln, *et al.*, 2010; van Dael, *et al.*, 2006). The self-certainty scale has not been measured as extensively as the JTC bias, however emerging evidence

suggests it shows similar associations with lower-order cognition including memory, IQ (Nair, *et al.*, 2014) and executive functions (Cooke, *et al.*, 2010).

Confidence in Judgement and Recovery

Garety's cognitive model suggests that reasoning processes, such as 'confidence in judgment' may play a role in maintaining positive symptoms in psychosis and this is somewhat supported by empirical evidence relating to the JTC and BCIS self-certainty scale. The JTC bias is widely found to be present alongside paranoid delusions and delusional conviction (Fine, *et al.*, 2007; Garety, *et al.*, 2005; Langdon, Ward, & Coltheart, 2010; Lincoln, *et al.*, 2010; So, *et al.*, 2012; Woodward, Munz, LeClerc & Lecomte, 2009) and is a better predictor of these delusional experiences when compared to another reasoning process (attributional style) (Garety & Freeman, 1999; Garety & Freeman, 2013). Evidence linking the JTC bias with other psychopathology is less clear. For example, a recent study of established psychosis, found no global symptom differences between patients who did and did not jump to conclusions in a cross-sectional design (Freeman, *et al.*, 2014). However, this study used the more difficult version of this task (40:60 ratio), which may have increased the likelihood of lower-order cognition confounding the relationship between the JTC bias and symptom severity. Further, the sample examined by Freeman and colleagues, presented with a limited range of symptoms (all subjects had persistent persecutory delusions) which may also have hampered the detection of true correlations.

The relationship between the JTC bias and symptom severity in FEP samples is more inconsistent. For instance, one FEP study found no cross sectional difference

in delusional symptoms, nor was there a difference in severity of hallucinations, anxiety, depression or number of hospitalisation, between those who did or did not show the extreme JTC bias (Dudley, *et al.*, 2011). However, a study using a more heterogeneous FEP sample, found the JTC bias *was* correlated with delusional symptoms, even after accounting for neuropsychological variables (Falcone, *et al.*, 2014). The cross-sectional findings from these two research groups are different despite very similar research designs and sample characteristics (i.e. both studies used the same DTD thresholds, 15:85 beads ratio version, and the same proportion of participants endorsed a JTC response). However, the negative findings in Dudley and colleagues study may be due to the fact that these researchers categorised delusions using a binary variable (delusions present or absent) which may have limited their power to detect relationships between symptom severity and the JTC bias.

Interestingly, both of these research groups went on to examine FEP participants longitudinally (Dudley, *et al.*, 2013; Falcone, *et al.*, in press) to show that the JTC bias became a predictor of the persistence of delusions over time. An important caveat to these prospective FEP findings was that JTC only predicted later symptom recovery in a *subset* of participants (those who showed the JTC bias across baseline and follow-up). Such findings provide some support that the JTC bias represents a stable, trait-like reasoning style in *some* individuals, and therefore may be useful for predicting outcome prospectively.

When ‘confidence in judgement’ is measured using the BCIS self-certainty scale, a relationship with symptom severity is also found in some studies (though the literature base for the self-certainty measure is more limited than JTC). For instance, in a sample of older patients with schizophrenia or schizoaffective disorder, the self-

certainty index correlated significantly, though weakly with total psychopathology scores, in a mildly symptomatic sample (Pedrelli, *et al.*, 2004). In another established psychosis sample with more acute symptoms, high self-certainty was significantly correlated with positive symptoms of psychosis, though not related to negative symptoms (Bora, *et al.*, 2007). Only two studies have examined the relationship between self-certainty and symptom outcomes in FEP, and neither study found these variables to be associated cross-sectionally (Buchy, *et al.*, 2009; Tranulis, *et al.*, 2008). However, the prospective value of this measure has not been tested in FEP.

In summary, review of the confidence in judgement literature (as measured by the JTC bias and BCIS self-certainty scale) suggests that this concept has some scope for predicting the maintenance of positive symptoms of psychosis, particularly delusions. However, its prospective value and relationship with other psychopathology outcomes in FEP has only been tentatively evidenced (Dudley, *et al.*, 2013; Falcone, *in press*). There is no literature examining this construct in relation to functional outcomes in psychosis. One particular reason for inconsistencies between the JTC and recovery is that studies report different base rates of JTC within samples, use different methods of defining the JTC and employ different versions of the Beads Task. It is not clear from the literature whether instruments of reasoning (JTC and self-certainty) converge or which measure is better associated to recovery. Comparing these factors could help validate whether these instruments tap into the same ‘confidence in judgement’ construct that they purport to index.

Cognitive Insight

Review of the cognitive literature thus far has highlighted how meta-cognition (self-reflection) and reasoning style (confidence in judgement) are relevant constructs

in psychosis. However, this review has also revealed that an understanding of these constructs' relationship to recovery outcomes in FEP, and over time, is limited. A core message of Garety and colleagues' cognitive model of psychosis is that it is the *integration* of cognitive processes that leads to positive symptoms enduring over time, not one single cognitive aspect in isolation (Garety, *et al.*, 2001). The Beck Cognitive Insight Scale (BCIS) (which has so far been discussed in relation to its two independent sub-scales) can also assess the cumulative impact of higher-order cognition: through a measure which the authors term '*Cognitive Insight*'. Cognitive Insight is derived by deducting the BCIS self-certainty scale item total from the BCIS self-reflective scale item total, and Beck and Warman (2004) suggest that high self-reflectiveness (greater meta-cognition) and low self-certainty (lower confidence in judgement) is the formula for good Cognitive Insight. The rationale underlying this combination score is that these scales are considered to be qualitatively distinct, though also co-dependent. The relationship between these constructs are such that a high level of self-certainty might diminish one's ability or willingness to be introspective, and likewise good self-reflective skills may enable one to redress cognitive bias (Beck & Warman, 2004). The idea that these constructs operate together is supported by neuro-imaging studies, showing that individuals with damage to neural areas which are considered responsible for self-reflective capacity (cortical midline structures in the pre-frontal lobe) are also over-confident in their cognitive capacity and performance (van der Meer, *et al.*, 2010).

Comparisons of the BCIS composite scores obtained from psychiatric inpatients with psychosis vs. psychiatric inpatients *without* a psychosis diagnosis are significantly different with large effect size (with non-psychosis patients showing

greater Cognitive Insight). This difference is of greater magnitude than the difference between these groups when scores on BCIS subscales are individually compared (Beck, *et al.*, 2004). The specificity of *poor* Cognitive Insight to psychosis disorders is further supported by studies of the BCIS in control populations. For instance, delusional prone controls *do* show high self-certainty scores, but also show *high* self-reflective capacity (Warman & Martin, 2006). This suggests that in the general population, the capacity to reflect may protect against transition to psychotic disorder. It is plausible that Cognitive Insight within psychosis populations may vary and that poor Cognitive Insight is a marker of poor prognosis.

Cognitive Insight and recovery

Three different studies have found that the correlation between the BCIS composite score and symptom outcome is stronger than the correlation between recovery and either of the BCIS subscales separately (Bora, *et al.*, 2007; O'Connor *et al.*, 2013; Perivoliotis, *et al.*, 2010). For instance, a psychosis-spectrum FEP study found that Cognitive Insight at illness onset is a better predictor of overall symptom severity at 12 month follow-up, than lower-order cognition, executive function or insight into illness (O'Connor, *et al.*, 2013).

Cognitive Insight may be particularly relevant to understanding recovery outcomes in talking therapies. For example, the BCIS composite score has been shown to mediate the response to various treatments including CBTp, cognitive remediation and social skills (Burton, Vella, & Twamley, 2011; Granholm, Auslander, Gottlieb, McQuaid, & McClure, 2006; Perivoliotis, *et al.*, 2010) such that increases in Cognitive Insight was associated with lower positive, negative and general symptom severity. Cognitive Insight also shows prospective value; for instance, in an

established psychosis spectrum sample (n=69) better Cognitive Insight prior to engaging in a cognitive training intervention, predicted less severe positive symptoms and reduced depression 6 months later, in spite of the fact that Cognitive Insight did not associate with these factors cross-sectionally (Burton, *et al.*, 2011). Finally, in a community outpatient psychosis sample, the individual BCIS subscales showed different relationships with symptom outcome, with higher baseline self-reflective scores associated with reduced delusional severity, whereas low self-certainty predicted fewer hallucinations. Importantly however, the combination of these subscales (Cognitive Insight) at study entry predicted *overall* symptom severity post CBTp treatment (8 months later) (Perivoliotis, *et al.*, 2010).

The relationship between Cognitive Insight and occupational and social domains of function is scarcely researched and has been identified as an area in need of better understanding (Riggs, *et al.*, 2010). Good Cognitive Insight has been found to predict independent living in psychosis (Favrod, *et al.*, 2008), though is not related to quality of life (Carlson, *et al.*, 2009). In the only FEP prospective follow-up study to examine associations between Cognitive Insight and overall functional disability, no relationship was found at 12 months (O'Connor, *et al.*, 2013). However, given that the clinical stage-model theory in psychosis suggests that predictors can shift with illness progression (Alott, *et al.*, 2011; McGorry, *et al.*, 2010) it may be useful to examine these variables relationship at a later stage in the recovery pathway. To this author's knowledge, the association between Cognitive Insight at illness onset and recovery from psychosis in the medium-term (3 to 7 years following FEP) has not been examined.

Summary of section

The aim of the previous section was to evaluate whether cognitive constructs relevant to a cognitive model of psychosis (Garety, *et al.*, 2001) are associated with symptom and functional recovery. IQ, self-reflection and confidence in judgement have been found to associate with aspects of recovery in psychosis, some more tentatively than others. Relationships between these cognitive variables and recovery appear to operate differently in established psychosis and FEP, which is in agreement with stage-model understandings of psychosis (McGorry, *et al.*, 2010). This review has also highlighted nuanced relationships that exist between particular aspects of cognition and recovery *type* (IQ with functional recovery, JTC bias with delusional severity). One critique of the literature is that cognitive variables are often tested cross-sectionally and without hypothetical expectations (Cooke, Peters, Kuipers, & Kumari, 2005). This has resulted in some confusing and equivocal findings in the field. Potentially overlapping cognitive constructs need to be compared in the same cohort, to verify that they are indeed distinct, and to evaluate their relative contribution toward recovery outcomes.

Rationale for Current Study

There is a clear clinical rationale for examining cognitive predictors in psychosis, as Cognitive Behavioural Therapy for psychosis (CBTp) is endorsed as an effective treatment for improving recovery outcomes in psychosis (NICE guidelines, 2014). However at this stage, it is not clear what cognitive mechanisms are involved in symptom change during therapy (Garety, *et al.*, 2014). It is intuitively plausible

that both meta-cognition and reasoning processes are important mechanisms of change in CBTp as increased awareness and self-reflection (meta-cognition) may allow reasoning biases (such as overconfidence in judgement) to be recognised and challenged. Equally plausibly, this relationship may operate in reverse. However, given that lower-order cognitive disturbance is known to be prevalent in FEP, it is also important to account for this before the unique role of higher-order cognition in recovery can be endorsed.

A research question was therefore proposed: Can Cognitive Insight predict recovery from psychosis in a first-episode cohort? The rationale for asking this question is provided by a cognitive model of psychosis which hypothesises that impairment to higher-order cognitive functions (measured by the BCIS) contributes to the formation and maintenance of psychotic illness (Garety, *et al.*, 2001). Recovery was operationalised in this study in terms of psychiatric symptoms, hospital admissions and psychological, social and occupational function to enable relationships between recovery *type* to be examined. This distinction between symptom and functional recovery is important because evidence suggests that these recover domains operate independently, and may have different prognostic indicators.

Relationships between specific cognitive factors and recovery will need to be examined concurrently to factor out overlapping variance between cognitive factors. The BCIS self-certainty scale is considered a more direct indicator of ‘confidence in judgement’ than the JTC bias, however given that the latter has been thoroughly researched to show established associations with delusional symptoms, it may be useful to account for this variable before drawing conclusions about the unique contribution of the BCIS scales. IQ will also be accounted for, given the relevance of

lower-order cognition to cognitive models of psychosis, and because there is evidence linking IQ to functional recovery in psychosis. The BCIS instrument will be used to measure Cognitive Insight (BCIS composite score) and the two BCIS subscales will also be examined in isolation (self-certainty *and* self-reflection) to assess their relative contribution to recovery. The literature suggests that correlates between cognition and outcome in psychosis may change over time (Allott, *et al.*, 2011) and that illness trajectories become more stable and discrete over time (McGlashan, 1988). Indeed the evidence presented in this review suggests that some cognitive variables' relationship to outcome may become stronger as illness progresses (Carlsson, *et al.*, 2006). The illness course literature generally defines short-term outcomes in psychosis ranging from 6 months to 2 years and medium-term outcomes from 3 to 7 years (Allott *et al.*, 2011; McGlashan, 1988). Therefore changes to the relationship between Cognitive Insight and outcome changes in the short-term (12 months post FEP onset) and the medium-term (five years post FEP onset) may be observed. Results from this research may provide evidence in relation to cognitive models in psychosis, and inform interventions to target cognitive predictors of prognosis in FEP.

Study Hypotheses

Based on the available evidence, the primary hypotheses for this study are as follows

1. Cognitive Insight (as measured by the BCIS composite score) will predict medium-term symptom severity in FEP after controlling for the JTC bias.
2. Cognitive Insight (as measured by the BCIS composite score) will predict medium-term functional disability in FEP after controlling for IQ.

3. The relationship between Cognitive Insight (as measured by the BCIS composite score) and symptom and functional outcome will be stronger in the medium-term, compared with the short-term in FEP.

METHOD

Design

This section will firstly provide an overview of the current study before describing the broader context from which this study is derived.

The current study

This study used a within subject longitudinal design to analyse relationships between independent variables of interest (Cognitive Insight, JTC, IQ) collected at the first onset of psychosis (Time 0) and the dependent variables of interest (symptom and functional recovery outcome variables) collected at 12 month follow-up (Time 1) and five year follow-up (Time 2). Ethical approval for the study was obtained from the Institute of Psychiatry and South London and Maudsley NHS Foundation Trust Research Ethics Committee (see appendix A) and the psychology department at Royal Holloway University (see appendix B).

The broader GAP project context

This study was imbedded within a larger project funded by the National Institute of Health Research (NIHR) Biomedical Research Centre. This larger project was the Genetics and Psychosis (GAP) study and was conducted through the Psychosis Studies Department at the Institute of Psychiatry, Kings College London. The GAP project began in 2006, and recruited individuals between the ages of 18 and 65 experiencing psychosis for the first time. The recruitment of participants at Time 0 ceased in May 2011, and the longitudinal aspect of this study is ongoing. The GAP

project investigates a wide variety of environmental and genetic risk factors of psychosis by collecting biological markers, physical health measures, psychological and socio-demographic information on both individuals with first episode psychosis and non-psychosis controls. All researchers involved in the larger project were trained assistants, psychologists and psychiatrists, and worked under the supervision and guidance of senior researchers and principle investigators. Formal training on all individual measures administered in the research battery was provided and consistency checks were completed.

The author's role in the GAP project

The author of this thesis actively contributed to, and shared responsibility for data collection across the baseline and longitudinal aspects of this study, with a special interest and management of neuropsychological data. The author was not responsible for the selection of materials for the larger study, but did design the study that is reported in this thesis, selecting measures from the larger study to test current hypotheses. The author also held a main role in facilitating service user-involvement in the design and implementation of the GAP project, and managing follow-up procedures.

Service-user involvement

The GAP project received funding from the Biomedical Research Centre (BRC) on the specification that stakeholder involvement was promoted through the research. To this end, the BRC service user advisory group were consulted during the GAP project to provide opinion on materials used to disseminate research findings with participants (i.e. newsletter updates of research findings, and leaflet material for

potential participants). Stakeholder Participation was also encouraged through consultation with the Service User Research Enterprise (SURE). SURE operates within the Institute of Psychiatry and employs people who have research skills and have also been users of mental health services. Their research tests the effectiveness of mental health services and treatments from the perspective of people with mental health problems and their carers. This author attended regular SURE meetings, to seek guidance and collate ideas to facilitate the stakeholder participation within the GAP team. This ongoing consultation with SURE enabled the involvement of service users to be closely monitored and evaluated. This ensured the avoidance of a tokenistic approach to service-user involvement in favour of service-user led collaboration (Rose, 2003). Based on this consultation, the author also collaborated with two service users (one client and one carer) who contributed to recruitment processes in the study. For instance, one of these service users attended a training session with GAP researchers to relay their experience of what it was like to be on an acute psychiatric ward for the first time as a patient with psychosis, to encourage researchers to engage patients sensitively on the ward. These service-users also talked to participants about study involvement, which was especially useful when potential participants had concerns about the study (i.e. some participants had a poor relationship with health professionals and felt distrustful of researchers). Both service users recruited to be involved in the GAP research project were CRB checked and given honorary contracts through the Institute of Psychiatry to carry out this direct research.

Participants

Participant numbers varied across time-points in this study. The total number of participants in this study was 111 participants at Time 0, 95 participants at Time 1 and 90 participants at Time 2. The majority of Time 0 participants were male (62%) and the median age was 28 years (sd= 9.1, range 18 -58). At study entry, 79.8% of participants were psychiatric inpatients and 20.2% were recruited from community mental health teams (CMHTs) and home-treatment teams (HTTs). Further descriptive information about these participants is provided in the results chapter. Power calculations confirm that the sample size obtained in this study (n=90 to 111) provided 80% power to detect a medium effect between Cognitive Insight and Time 2 recovery outcomes, after accounting for other potential confounders (Clarke-Carter, 2009).

Inclusion Criteria

An important epidemiological consideration of this study was that all participants were recruited from the catchment area which was served by the South London and Maudsley (SLAM) NHS Foundation Trust: Southwark, Lambeth, Croydon and Lewisham. To avoid systematic sampling bias, efforts were made to recruit participants from all secondary mental health-care providers in the catchment area. In order to be considered eligible for participation in the GAP study ≥ 1 week of active DSM IV recognised psychotic symptoms (in the absence of substance intoxication) was required (American Psychiatric Association, 1994). The following inclusion criteria were also applied: contact with psychiatric services for psychosis ≤ 6 months; fluent English speaker; aged between 18 and 65 years old; psychosis identified as having a non-organic cause (e.g. differential diagnoses discounted such

as medically induced psychosis i.e. delirium, history of head injury or neurological condition i.e. Parkinson's disease or Alzheimer's disease). The following exclusion criteria were applied: time in contact with psychiatric services for psychosis > 6 months; poor English fluency (i.e. the participant would require an interpreter); a history of previous treatment for the presence of psychosis or a known organic cause of psychosis.

Measures

Global Assessment of Functioning: GAF (Endicott, Spitzer, Fleiss & Cohen, 1976).

The GAF measure is a widely used observer-rated instrument to rate clinical and functional status on a scale from 1 to 100. For the purpose of this study, this measure was split into two separate scales to measure psychiatric symptoms (GAF-S) and social and occupational function (GAF-F). This modification to the original scale is known to improve the psychometric properties of the measure (Pedersen, Hagtvet & Karterud, 2007) (see appendix C). The scale is divided into 10 equal scoring intervals, and descriptions for each interval rating are provided with the measure. For instance ratings below 30 on the GAF symptom scale indicates that behaviour is influenced by psychotic symptoms, whereas ratings below 30 on the GAF function scale indicates that an individual is not maintaining social roles and may have difficulty initiating activities of daily living independently. Most outpatients will be rated 31 to 70, and most inpatients between 1 and 40 (Endicott, *et al.*, 1976). A previous FEP study has used a threshold of >59 on the GAF to define 'recovery' in FEP (Bertelsen, *et al.*, 2009) and this threshold definition was also adopted for the purpose of this study.

Authors of the original GAF scale suggest that information needed to rate a GAF score may come from “any source, such as direct interview of the patient, a reliable informant, or a case record” (Endicott, *et al.*, 1976, pg.767). This study used both face to face interview and clinical records to rate GAF outcomes. When psychiatric records needed to be accessed this was done via an electronic patient journey system (ePJS) which is the central recording system for all mental health service providers in the South London and Maudsley NHS trust. The time period for GAF ratings is generally for the preceding week, although in special circumstances, the scales’ authors permit a longer time period to be used to rate this measure (Endicott, *et al.*, 1976). For the purpose of this study, the GAF ratings represented a period of the preceding week, which was extended to one month if appropriate information was not available (i.e. the week of interview was not representative of previous weeks, or information from clinical records was sparse).

The GAF instrument shows good sensitivity to change in symptom severity over time when rated by trained researchers ($r=0.83$, $p<0.05$) (Endicott, *et al.*, 1976) and shows satisfactory inter-rater agreement, ranging from $r = .61$ to $.91$ across five studies, using a variety of observations including structured interview, vignettes and case records (Endicott, *et al.*, 1979). In the studies on which the original scale inter-rater agreement was based, the highest intra-class correlations (ICC) was achieved through direct interview (ICC=.91) whereas collecting GAF from clinical records was less reliable (ICC=.69). The most inconsistent GAF ratings were derived from interview transcripts (ICC=.61). In this study, meetings were held weekly to discuss new participants and rate the GAF scores based on consensus amongst researchers after reviewing interview observations and clinical records. The means of collecting

GAF at follow-up varied and were subject to psychometric investigation (inter-rater agreement between researchers and a convergent validation of GAF ratings collected through different observation methods: interview vs. clinical records). Findings pertaining to these psychometric analyses will be reported in the results chapter.

Number of inpatient admission days

The duration of episodes of care that participants had experienced since their first contact with services was collected in this study to determine number of admission days in psychiatric hospital. This was identified through examination of care episode dates as recorded on the ePJS system. Total days spent as an inpatient was calculated on the same date that the GAF follow-up score was rated. In order to compare hospital admission time across the cohort (where follow-up duration varied) number of admission days was divided by length of follow-up time to estimate the proportion of follow-up time spent in hospital, averaged over a five year period.

The Positive and Negative Syndrome Scale: PANSS (Kay, Fiszbein & Opler, 1987)

The PANSS instrument is widely used in research settings to measure psychopathology in psychosis populations (see appendix D). The instrument is divided into three separate scales: a seven-item positive symptoms (PANSS-P: range = 7 to 49), a seven-item scale to evaluate negative symptoms (PANSS-N: range = 7 to 49) and a 16 item scale to examine generalised psychopathology including mood, social engagement and general presentation (PANSS-G: range = 7 to 112). Each item is scored on a scale of 1 to 7: absent, minimal, mild, moderate, moderate severe, severe and extreme. A score of 4 (moderate) or higher indicates the presence of clinical psychopathology. In this study, the item ratings were completed through

interview with participants and by collecting collateral information from health-care workers based on seven days prior to assessment. Each PANSS scale can be analysed separately to examine symptom dimensions or the tool can be interpreted as a total score (range 30-210) into severity categories: mildly ill (<58), moderately ill (58-74), markedly ill (75-95) and severely ill (>96) (Leucht, *et al.*, 2005).

This scale has been subject to thorough psychometric examination.

Discriminant and convergent validity is demonstrated by the scales significant correlations with a series of clinical, genealogical, psychometric, and historical assessments (e.g. The Brief Psychiatric Rating Scale has a partial correlation with the composite PANSS score =.50, $p < 0.05$, Kay, Opler & Lindenmayer, 1988). In this study, each PANSS scale showed adequate internal consistency (Cronbach's $\alpha = .70$ (PANSS-P) $\alpha = .76$ (PANSS-N) and $\alpha = .63$ (PANSS-G). Each item has specific criteria for each point on the scale to assist with administration and scoring, and researchers were trained to rate the PANSS during study induction using clinical vignettes. PANSS has been shown in previous studies to have high levels of inter-rater reliability after sufficient training (Kay, *et al.*, 1988; Müller & Wetzel, 1998). In this study, inter-rater agreement coefficients for pairs of raters ($n=22$) were calculated using a Spearman-Brown formula (agreement amongst multiple observers corrected for number of observers). Mean level of agreement researchers on this scale was $r=0.814$, which is above conventionally accepted thresholds for adequate inter-rater agreement (Fleiss, Levin & Paik, 1981).

Diagnoses

Diagnoses were made according to DSM-IV criteria (APA, 1994) using the Operational Criteria (OPCRIT; McGuffin, Farmer & Harvey, 1991). OPCRIT allows individual symptom scores to be entered into a database, to provide a computerised algorithm to output an appropriate diagnosis. Scores entered were based on the SCAN interview (Schedules for Clinical Assessment in Neuropsychiatry, WHO 1994) which is a face to face structured assessment, supplemented by observations recorded in the clinical notes for the month following the participant's first contact with psychiatric services. The first month was used in order to increase reliability of diagnoses across participants who had been in contact with services for various time periods. All diagnoses were carried out by qualified psychiatrists subject to inter-rater reliability checks (ICC= .97). Diagnoses were grouped into two categories: '*non-affective psychosis*' (ICD-10: F20-F29: schizophrenia, schizophreniform disorder; atypical psychosis; psychosis not otherwise specified) and '*affective psychosis*' which included both manic type: (ICD-10: F25.0, F30.2: schizoaffective disorder- manic type; manic episode with psychotic features) and 'depressive type: (ICD-10: F25.1, F32.3: schizoaffective disorder- depressed type; major depressive episode with psychotic features). OPCRIT also provided DSM-IV diagnoses which were used to classify diagnostic groups in this study.

The Beck Cognitive Insight Scale: BCIS (Beck, Baruch, Balter, Steer, & Warman, 2004)

The Beck Cognitive Insight Scale is a self-report questionnaire measured on a four-point Likert scale from 0 (do not agree at all) to 3 (agree completely) which was

modified to a seven-point Likert scale in this study to match a previous FEP study (O'Connor, *et al.*, 2013) (see appendix E). This scale consists of two psychometrically distinct factors: a 6-item self-certainty scale (SC: range 6 to 42) and 9-item self-reflective scale (SR: range 9 to 63). The two scales can be examined separately or can be combined to examine a Cognitive Insight composite score (self-reflective score minus self-certainty; range -33 to 57). No time frame is provided for this measure.

The two factor structure of the BCIS, as advocated in the original scale publication paper, has been replicated in seven other studies (Riggs, *et al.*, 2010) including an FEP sample (Tranulis, *et al.*, 2008). Confirmatory factor analysis conducted in this study sample suggests that factor loadings for both constructs were equivocal to the original item loadings (Beck, *et al.*, 2004) and the two factor model reached statistical significance (t -ratio >1.96) (Wang & Wang 2012). Cronbach's α for the self-certainty scale was 0.76 with item-total correlations ranging from .61 to .72, $p < .001$. The coefficient α for the self-reflective scale in this study was 0.71 with item-total coefficients ranging from .35 to .69 $p < .001$. Item 14 from the SR scale "*there is often more than one possible explanation for why people act the way they do*" had the lowest correlation with scale total ($r=.35$). Interestingly, this is also the only item of the scale which requires participants to reflect upon *other persons*, whereas other SR items evoke reflection about one's *own* thoughts and behaviour. It may be that this item taps into aspects of ToM (a meta-cognitive construct described in the introduction), which has lowered its correlation with other self-reflection items. However, the removal of item 14 had a minimal impact upon the coefficient α of this scale (changed from .71 to .72) so in order to maintain validity and comparability to other studies, the decision was taken to retain this item in the data-set. The internal

consistencies for the BCIS scales in this study are higher than the consistencies reported in the original publication paper which were: $\alpha=.60$ for SR and $\alpha=.68$ for SC (Beck, *et al.*, 2004).

Other psychometric properties of this scale (including construct validity, criterion validity, test-retest validity, convergent and discriminant validity) have been examined and deemed adequate across many studies including FEP samples (Lepage, *et al.*, 2008; Tranulis *et al.*, 2008; See Riggs, *et al.*, 2012 for comprehensive review). This measure has also been translated into a number of different languages and shows cross cultural applicability (Carlson, *et al.*, 2009; Kim, Jhin, Chung, Chang & Lee, 2007; Engh, *et al.*, 2007; Favrod *et al.*, 2008; Uchida, *et al.*, 2009). No normative population scores or clinically relevant cut-offs have been established or recommended for the BCIS measure.

The Probabilistic Reasoning Beads Task (Huq, Garety, & Hemsley 1988).

This task has already been outlined in the first chapter (see reasoning processes section) and a full outline of the instructions and experimental paradigm is provided in appendix F. This study used the 15:85 ratio version of this task. The decision to use this version rather than the 60:40 ratio was informed by concerns that the latter version is more difficult (Dudley, *et al.*, 1997) and may index lower-order cognition rather than reasoning processes *per se* (Moritz & Woodward, 2005). The possible number of beads drawn before an individual makes a decision of certainty ranges from 1 to 20. To optimise consistency, the administration was computerised and standard written instructions read and shown to participants: each slide presented all the information required for all stages (i.e. two jars, jars with mixed beads, 1st selected bead, 2nd selected bead etc.). Instructions were always read out verbatim, at a

measured pace, and researchers verified participant understanding with each slide presentation. The task was not administered if the participant was unable to show understanding of the instructions.

The ‘draw to decision’ (DTD) measure was used to identify a JTC bias in this study, as this measure has been shown to be most reliably associated with delusions (Fine, *et al.*, 2007; Garety, *et al.*, 2005). A tendency to ‘Jump to Conclusions’ (JTC) was operationally defined as the respondent making a decision after two beads or fewer as has been used in other FEP studies (Dudley *et al.*, 2011; Falcone *et al.*, 2014). Studies support the superiority of this categorical definition over continuous measures. For instance, continuous measures are not normally distributed and a categorical version is shown to be better related to symptom change (Garety *et al.*, 2005; So, *et al.*, 2012).

The Wechsler Adult Intelligence Scale -Third Edition: WAIS III (Wechsler, 1997).

Full-scale IQ was extrapolated from the Wechsler Adult Intelligence Scale – Third Edition. This instrument was used because of its wide applicability and use in research and clinical settings. Version III was the most up to date at the time that participant recruitment began in the GAP project. A short version of WAIS III was adopted and included the following subtests: Information, Digit Span, Block Design, Matrix Reasoning and Digit Symbol Coding. These scores were averaged within their domain and multiplied by the total number of WAIS III subtests in each domain to approximate an individual IQ score; using short-forms of WAIS is common in psychosis research to estimate full scale IQ (Holthausen, *et al.*, 2007; Leeson, *et al.*, 2009; Missar, Gold & Goldberg, 1994; O’Connor, *et al.*, 2012). These particular subtests were chosen because they index a wide range of cognitive abilities, including

all relevant IQ domains (verbal comprehension and working memory, perceptual reasoning and processing speed).

The reported psychometric properties of these IQ subtests are taken from the WAIS III technical manual (Wechsler, 1997). Correlations between subtest and full scale IQ are strong: (Information $r=.81$, Block Design $r=.73$, Matrix Reasoning $r=.75$). The Digit Symbol coding and Digit Span subtests have slightly lower correlations with full scale IQ ($r=.61$) although were still included in the battery because they represent lower-order cognitive functions sensitive to psychosis-related pathology (Leeson, *et al.*, 2008; Saykin, *et al.*, 1994). Reliability coefficients for these sub-tests have been calculated based on item scores from a single administration, divided to form two half tests from and corrected by the Spearman-Brown formula. The Digit Symbol Coding task is a timed task, so test-retest reliability was calculated instead of a half-split coefficient. Reliability coefficients of these subtests, for the age ranges relevant to this study (18 to 65) are as follows: Information, Matrix reasoning and Digit Span $=.90$ and above ; Block Design coefficients ranged from $.85$ to $.90$; and Digit Symbol Coding ranged from $.81$ to $.86$. A sub-group of researchers (including the author) were trained in WAIS administration and scoring, with guidance from the senior neuropsychologist advisor in the team. All researchers administering neuropsychological measures were required to pass a practical administration test before given authorisation to complete this assessment with participants.

Figure 2 illustrates the administration of all measures used in this study over the three study-points. Procedures around study recruitment and completion of study measures will be described in the next

section.

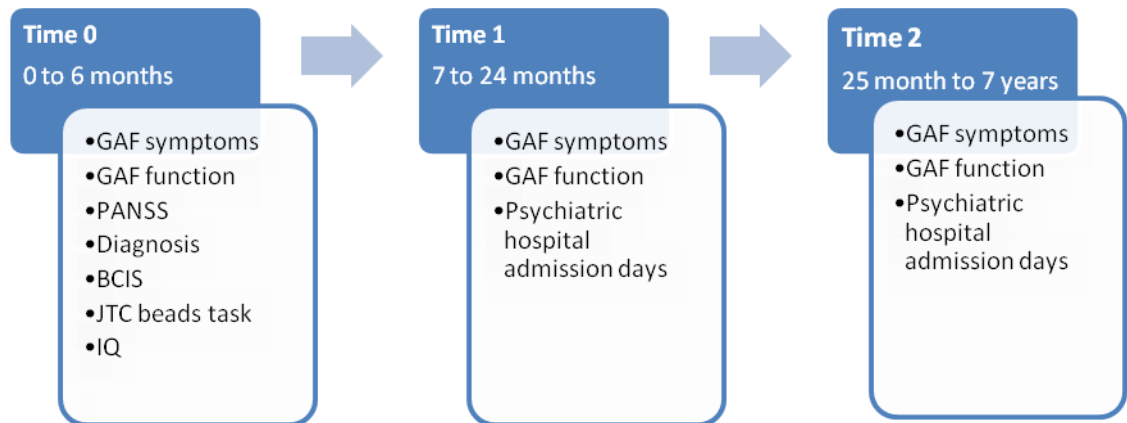


Figure 2: Timeline for the collection of measures.

Procedure

The following section will describe the procedures as they apply to the different phases of this thesis project, including recruitment of participants, completion of baseline measures (Time 0) and completion of follow-up measures (Time 1 and Time 2).

Recruitment

During the Time 0 assessment period (Jan 2006 to May 2011) a weekly screen of the electronic-Patient Journey System (ePJS) was carried out to identify all new FEP cases accepted into psychiatric wards and community mental health teams in the catchment area. Eligibility was largely determined by reading medical entries from the electronic records and supplemented by regular communication with service doctors, nurses and healthcare assistants, who also provided important information for

risk assessment. Participants aged between 18 and 65 as per inclusion criteria were identified as eligible, and if deemed appropriate following risk assessment, were approached as soon as possible.

A GAP researcher introduced themselves and the study to eligible individuals and provided written information about the study (see appendix G). Once the patient had carefully read all aspects of the information and consent sheet, and if the patient was amenable, written consent was taken during this first encounter. In situations where participants were undecided or did not understand the research, they were approached again at a later date (with their permission) to gain consent (up to a maximum of 6 months after first contact with services). In many instances, researchers met with participants on several occasions to ensure they had the capacity to understand the study before written consent was obtained. All participants were made aware that participation was voluntary and that they could refuse re-approach or withdraw from the study at any point without indicating reason and without impact on their ongoing clinical care. Approximately 44% of eligible individuals who were approached to participate in this study refused to take part. According to a qualitative study which assessed recruitment processes in the GAP project, reason for refusal was highly variable and included: lack of acceptance of psychosis label; fears about the impact of partaking on their health; concerns about confidentiality; the influence of other inpatients; and inappropriate timing of when they were approached (Woodall, Howard & Morgan, 2011).

Time 0 assessment procedures

Once participant consent was agreed, baseline assessments were arranged. These assessments were carried out on the ward if a patient was under admission, at

the research office base at the Institute of Psychiatry; or within their community mental health service office. While most patients recruited into this study were inpatients at the time that consent was obtained (79.8%), Time 0 assessments usually occurred once participants left hospital, and their mental health had stabilised. This flexible window for data collection was necessary given that participants were often highly symptomatic at study entry and commonly experiencing great distress about their circumstances. There was variability in the sequence of administered assessments and length of time that the battery of tasks took to complete.

Time 1 and 2 follow-up assessment procedures

During Time 0 assessment, permission was sought for participants to be contacted at a later date to repeat some measures, and to contact the participant's healthcare providers to gather information about their recovery progress. A sub-team of researchers from the GAP project, including this author, were responsible for contacting participants and arranging follow-up assessments. Researchers used contact numbers given by participants at Time 0 and/or sent letters to their home address to invite participants to be involved in the follow-up component of the study. If participants were agreeable, appointments were arranged, at which, research information sheets were given to participants and written consent obtained again (see appendix G). During interviews with clients, researchers rated GAF symptom and function based on participant self-report and presentation at interview. If clinical notes were available within the one month time-frame of interview then clinical records were also taken into account for GAF ratings.

Assessments were arranged within the Time 1 and Time 2 follow-up window, as indicated in Figure 2. The time windows used in this study for follow-up were

broadly informed by prior illness course literature which considered short-term follow-up to range between 6 months to 2 years post FEP and medium-term follow-up between 3 to 7 years post illness onset (Allott, *et al.*, 2011; McGlashan, 1988). Figure 2 shows the actual follow-up ranges achieved in the study. The same Time 1 and Time 2 data collection windows were applied to assessment measures completed via clinical records. While wide follow-up windows were set, researchers aimed to assess individuals as close to 12 months and five years since FEP onset as possible, to optimise the reporting of recovery rates across the cohort at set time-points. However, patients were often followed up for less than five years for the Time 2 window because they were recruited later than others and the study had to be completed. Other patients were followed up for more than five years after FEP because of a delay in arranging interview. Participants were more easily traceable for the Time 1 follow-up and 30% were assessed within one month of the 12 month window. However, it was considerably more difficult to arrange interview for the Time 2 follow-up and only 3.4% of participants had follow-up measures completed within one month of the five year follow-up window.

When participants were not contactable or refused further participation, information from mental health service providers via electronic clinical records (ePJS) was used to complete the Time 1 and Time 2 assessment battery. Information that was collected in this manner was carefully vetted for validity and bias. For example, information that was available for *all* patients was preferentially sourced to score the GAF such as formal documentation (i.e. psychiatry reports, discharge summaries, admission/discharge summaries and Care Programme Assessment (CPA) reports). One tool that was also helpful for scoring the GAF was item ratings on the Health of

The Nation Outcome Scale (HONOS), which is the most commonly used routine clinical outcome measure in English mental health services (Wing, Curtis & Beevor, 1996). This tool contains 12 items pertaining to behaviour, impairment, symptoms and social functioning that can be rated by any health care professional.

Debrief and study completion procedures

Following participant involvement in each stage of the research, a debriefing process was followed, allowing opportunity for participants to ask questions about the research generally, and for researchers to provide contextual information about what the study was hoping to achieve. Individualised feedback to participants about their own responses or performance on neuropsychological measures was not provided, and participants were made aware of this during consent procedures. Researchers were trained to signpost participants to where to receive local support when emotional distress was indicated during assessment (i.e. to contact care coordinator if they were supported by secondary care or to contact their GP in cases where participants were discharged from mental health services, Samaritan help lines or A&E as deemed appropriate). Participants were provided with a study email address to be able to contact the study administrators to withdraw their participation from this research or to seek further information about the study. Newsletters were disseminated to participants through the post, outlining research findings from the broader GAP project.

RESULTS

Overview

This chapter outlines the data screening procedures and descriptive statistics for the study sample. This is followed by an exploration of the psychometric properties of the main outcome measure (GAF symptom severity and general function). Next, the relationships between key measures are examined through correlation analyses. This correlation analysis informed the author as to which variables to choose for regression models and clarified the relationships between the cognitive variables. Finally, the main findings in relation to study hypotheses are described.

Data Screening

Outliers

Visual inspection of box-plots helped to identify data entry errors or otherwise extreme outliers that may have exerted influence upon the descriptive data figures. Extreme outliers were defined as any score on a continuous measure that deviated three times the length of the 25-75% quartile range, as measured from the inner hinge of the visual box plots (Gray & Kinnear, 2012). Only the 'hospital admissions variable' contained extreme outliers (three) and these cases were retained in the dataset for the following reasons: a) these cases were legitimately representative of population data (some participants did spend majority of follow-up time as psychiatric inpatients; b) removal of these outliers did not assist in normalising the distribution of

the admission days variable (see distribution section). Non-extreme outliers (defined as data 1.5 times the length of the inner quartile range) were found in other variable data-sets (two in PANSS positive and one in the BCIS composite index). However, these data were also retained in the data-set as the sample size was considered robust enough to prohibit deviant scores from having a large impact upon the overall variance and shape of the measure distributions (Gray & Kinnear, 2012).

Distributions

The distribution of each continuous measure used in this study was inspected to decide whether these data were suitable for parametric statistics. Normality was assessed using measures of kurtosis and skew and by consulting histograms. A symmetrical and bell curved distribution of scores was assumed if z scores on these measures of normality were < 2.58 (Field, 2009).

The two subscales examined in the Beck Cognitive Insight Scale measure (self-certainty and self-reflectivity) were examined separately and in combination (Cognitive Insight composite index). All three components of this instrument showed a symmetrical spread of scores. Tests of normal distribution were conducted on all other continuous variables used in this study, including GAF symptom and function scores across the three time points, PANSS measures, the IQ index and number of inpatient admission days over the five year follow-up period. PANSS positive and PANSS negative scores both showed a significantly positively skewed distribution ($z=2.81, p<0.01$ and $z=2.66, p<0.01$ respectively). A square root transformation was carried out on these measures, which resulted in a normal distribution ($z=1.11$ and $z=1.44$ respectively). The data for number of inpatient admission days was also non-normal, showing a positive skew ($z=14.11, p<0.01$) and flattened distribution ($z=7.13,$

$p < 0.01$). This highly positive skew may be a result of a large portion of participants (48.8%) experiencing no further psychiatric admissions following their first episode of psychosis. This variable was transformed using log 10 (skew $z = -0.91$, $p > 0.01$; kurtosis $z = 0.54$, $p > 0.01$) and this transformed variable was used for parametric tests of association.

Missing data

The clinical nature of this study meant that participants were often highly symptomatic at study entry, and in addition to a very lengthy GAP assessment battery, there is consequently some variation in completion rates for individual measures. Completion rates for each individual measure varied from $n = 101$ to 111. Reasons for incomplete measures were identified as researcher error or participant refusal to have particular measures administered. No systematic imputation for missing data was conducted, as the sample size was large enough to withstand data omission and still detect true relationships in the data (minimum required sample size of 80). This is with the exception of one case item omission from the BCIS self-reflective scale, whereby a single mean imputation solution was deemed appropriate (as scale was normally distributed) to replace one missing item score (Clark-Carter, 2009). Attrition rates at follow-up are described in the next section.

Sample Characteristics

Response Rate and Attrition

Reasons for attrition at each study time point, as well as a breakdown of those seen for face to face interview and those assessed via clinical records, are provided in Figure 3. The total Time 1 follow-up sample was 95 participants. The total Time 2 sample was 90 participants, and was inclusive of four people who were un-contactable during the Time 1 assessment window and re-entered the follow-up cohort for Time 2. The average follow-up time for Time 1 was 11.5 months (sd=2.2, range 7-24 months) after Time 0 assessment. The average time for Time 2 follow-up was 49 months, or just over four years (sd=11.5, range 27-86 months). By Time 2 follow-up, 18.9% of the eligible cohort had become untraceable. Efforts were made to contact GPs to gain rudimentary information on missing participants, such as whether the participant had died or emigrated. This information is also presented in Figure 3.

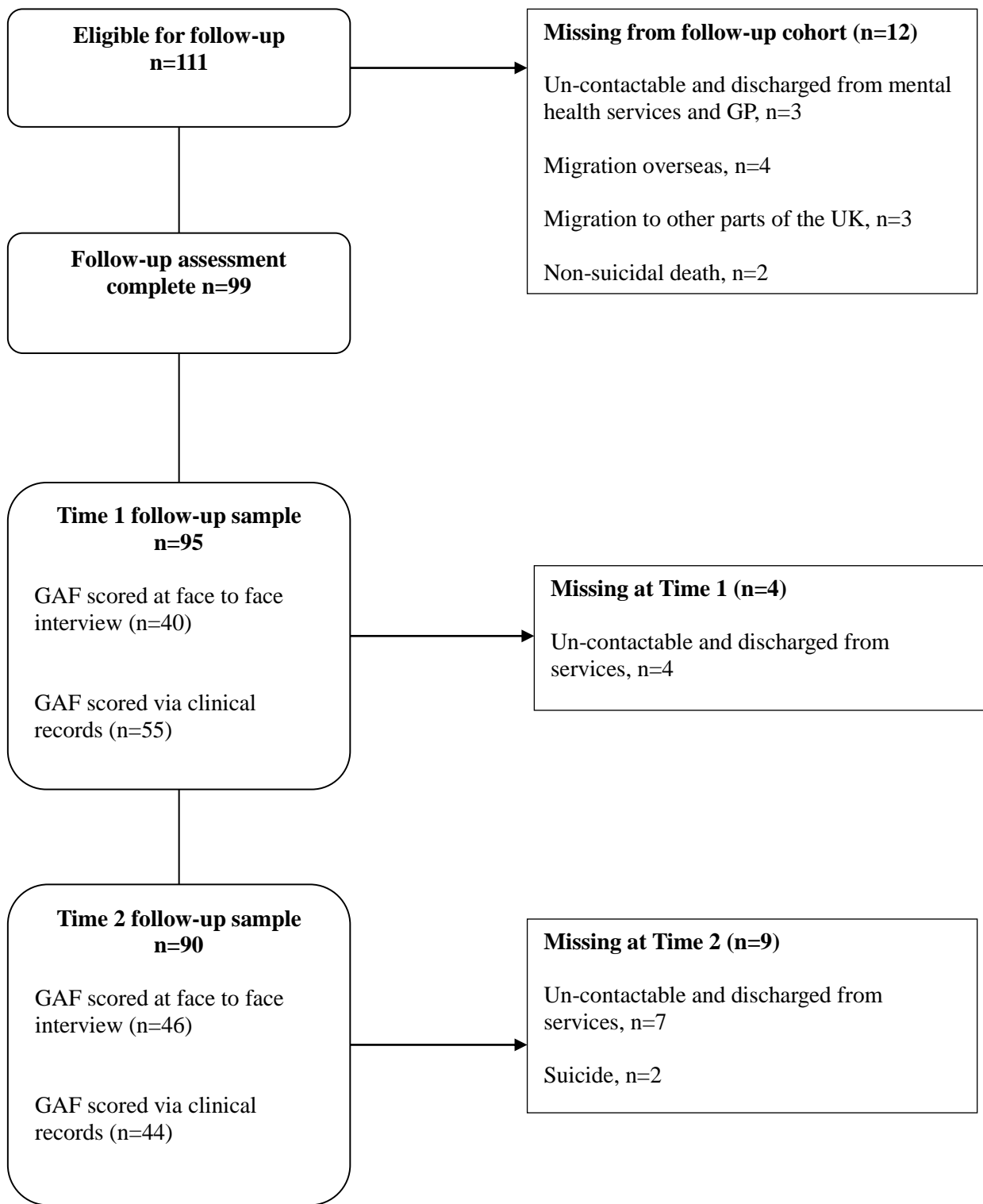


Figure 3: Flowchart indicating follow-up methodology and attrition rate

Analysis was carried out to examine Time 0 variable scores for participants who were traceable at Time 2 follow-up (n=90) compared with participants who had dropped out of the cohort by Time 2 (n=21). This analysis was carried out using independent t-tests for continuous data and chi square for categorical data. Equal variation within these groups was assumed for all Time 0 variables except one (Time 0 negative symptoms), where appropriate non-parametric statistics were used. Table 1 compares the sample characteristics of those retained at follow-up with those of participants missing at follow-up. This was necessary to establish whether attrition was at random, or whether systematic bias was operating in the Time 2 sample (Rubin, 1976). These findings suggest that there are no significant differences between those who were traceable for follow-up assessment and those who had become untraceable at Time 2, with the exception of baseline GAF scores. In terms of this variable, those who were un-traceable at follow-up had significantly more psychopathology at Time 0 than those participants who were seen for follow-up $t(109)=-2.461, p=0.015$.

Table 1: Comparison of the Time 2 sample vs. sample missing at follow-up

Total eligible (n=111)	Retained at Follow-up (n=90)	Lost at Follow-up (n=21)	<i>Statistic</i>	<i>Sig</i>
Age Median (sd)	29.44 (9.12)	31.47 (11.67)	$t(109)=-.919$	0.437
BCIS Composite Mean (sd)	14.33 (14.05)	12.86 (13.55)	$t(109)=-.436$	0.664
PANSS Total Mean (sd)	58.23 (14.67)	64.12 (12.75)	$t(99)=1.501$	0.137
GAF symptoms Mean (sd)	50.58 (20.22)	38.75 (15.37)	$t(109)=-2.461$	0.015
GAF function Mean (sd)	57.98 (16.97)	55.50 (17.16)	$t(108)=-.591$	0.555
IQ Mean (sd)	90.39 (15.34)	89.57 (13.58)	$t(99)=-.212$	0.833
Gender Male (%)	63.3%	61.9%	$(\chi^2(1)=-144)$	0.704
JTC Bias Present Yes (%)	45.9%	52.6%	$(\chi^2(1)=.284)$	0.594
Diagnosis Non Affective psychosis (%)	57.8%	71.4%	$(\chi^2(1)=1.33)$	0.250
Ethnicity White British or European (%)	34.4%	23.8%	$(\chi^2(1)=.879)$	0.349

Sample demographics

Demographic data is described for the sample that completed at least one follow-up at either 12 months or five years following first-episode psychosis (n=99). The majority of participants were male (62%) and the median age was 28 years (sd=9.1, range 18-58). Each participant assigned themselves to a racial/ethnic group and these were then collapsed into the five following categories: White British (25.3%), Black African (24.2%), Black Caribbean (17.2%), White European (9.1%), Mixed Race (10.1 %), Asian (10.1%) and other (4%). The majority of this sample (60%) grew up and were educated in the UK. Further socio-demographic information, as collected at Time 0 can be found in Table 2.

Table 2: Socio-demographic information

Variable	Cohort with follow-up data (n=99)	%
Level of education Obtained	Postgraduate	2.1%
	Degree	16.0%
	A Levels	23.4%
	NVQ/Vocational qualification	23.4%
	GCSE'S	19.1%
	No qualifications	16.0%
Living/ Housing Status	Alone	37.4%
	Alone with Children	7 %
	With Partner	2%
	With Partner & children	9.1%
	Parents	29.3%
	Other Family	2%
	Friends	8.1%
	Other	5.1%
Employment Status	Unemployed	61.6%
	Student	9.1%
	Employed Full Time	17.2%
	Employed Part Time	12.1%
Relationship Status	Single	72.7%
	Married/living with someone	14.1%
	In a steady Relationship	10.2%
	Divorced, separated	2%
	Widowed	1%

Sample clinical characteristics

Clinical data is described for the sample that completed at least one follow-up at either 12 months or five years following first-episode psychosis (n=99). Participants were classified into eight different diagnostic categories, as reported in Table 3. The most common diagnosis at first-episode was schizophreniform disorder (29.3%). These figures were then collapsed into a binary diagnosis variable to compare non-affective with affective psychosis diagnoses, as evidence suggests that diagnoses can have an impact upon recovery outcomes in psychosis (Bromet, *et al.*, 2005; Riechler-Rossler & Rossler, 1998). The majority of participants in this sample (59.6%) were classified as having a non-affective diagnosis. Table 3 also describes the symptom severity of participants at Time 0. The threshold for clinical levels of symptoms using the PANSS is widely accepted to be >3 for each rating scale item (rating scale of 1 to 7) (Kay, *et al.*, 1987), which means that a score of 21 + on the positive and negative scales (i.e. a score of 3 or more on each of the 7 items) would indicate that participants' were clinically unwell at the time of assessment. The mean positive and negative symptom scores suggest that participants were below clinical thresholds in terms of psychosis, at the time of assessment. The mean PANSS total for this sample is 15 points lower than the reported mean score in one previous FEP sample examining the BCIS (Tranulis, *et al.*, 2008), but is commensurate with a different FEP study sample that examined the BCIS (Buchy, *et al.*, 2009). The mean GAF symptom score at Time 0 (where higher scores indicate fewer psychiatric symptoms) was in the mild range and is in agreement with the scale authors' expectations for outpatient status (Endicott, *et al.*, 1976). The range of days spent as a psychiatric inpatient varied widely for the first year following FEP from 0 to 365

days, and the median time spent in hospital over the first year was 32 days (sd=76.84; range 0-365 days). The median number of days spent as a psychiatric inpatient over the five years was 76 days (sd =220; range 0-1,406 days).

Table 3: Clinical characteristics of the sample

Research Diagnoses: DSM IV	n=99
Schizophreniform Disorder	29
Manic Episode with Psychosis	17
Schizophrenia	16
Psychosis Not Otherwise Specified	13
Major Depression with Psychotic Features	10
Schizoaffective Disorder Depressed	9
Schizoaffective Disorder-Bi Polar	4
Delusional Disorder	1
PANSS (n=93)	Mean (sd)
PANSS Positive	14.4 (5.4)
PANSS Negative	15.0 (6.2)
PANSS General	29.7 (7.0)
PANSS Total	58.7 (14. 5)
GAF (n=99)	
Symptoms	48.9 (20.3)
Function	57.4 (16.9)

Sample cognitive characteristics

Table 4 provides the descriptive data relating to the main measure in this study (BCIS composite score) as well as the two subscales that make up this measure (self-reflection and self-certainty). On the self-reflection scale, the median score fell very near to the mean score of 38 (sd=3.9) in a possible range of 7 to 63. Responses on the self-certainty scale also showed a mean equal to the median, in a possible range of scores of 7 to 42. Descriptive data for other cognitive measures collected in this study are also described. The mean IQ score was in the low-average range when compared to population norms, and this is commensurate with previous FEP findings (Carlsson, *et al.*, 2006). Individuals with IQ scores <70 were included in analysis (n=6), given that very low IQ scores have been described in other FEP studies (Leeson, *et al* 2011; O'Connor, *et al.*, 2012; O'Connor, *et al.*, 2013). IQ distributions were normal with the inclusion of participants with very low poor IQ performance (<70) and main findings were also unchanged when these cases were excluded. A large minority of this sample (47%) showed the JTC bias as according to a <3 beads threshold, which is the same proportion of participants found to show this bias in a different FEP sample that used the same draws to decision threshold (Dudley, *et al.*, 2011).

Table 4: Descriptive data for cognitive measures

Cognitive Measures	Mean	SD	Range
BCIS composite	14.63	14.07	25 to 43
BCIS Self-Reflection	38.76	9.71	17 to 57
BCIS Self-Certainty	24.13	8.03	11 to 42
IQ	90.69	15.35	58 to 128
JTC Beads Task*	4.79	5.15	1 to 20

* Descriptive data represents *draws to decision* on the Beads Task

Follow-up Data Quality

Given the two methodologies used to assess GAF, psychometric analyses were conducted to assess whether GAF ratings collected via clinical records alone were consistent and valid compared to GAF collected via clinical interview.

Inter-Rater Agreement

The usual manner for GAF to be collected in this study, over the three study time points, was via interview. In situations where participants were not available for interview, GAF was rated via clinical records. These assessments were completed independently by multiple researchers across Time 1 and Time 2. To ensure that GAF scores rated via clinical records were completed in a consistent manner during follow-up, the author and the three other researchers involved in data collection via clinical records (referred to here as coder a, coder b, coder c and coder d) conducted a reliability analysis. This required each researcher to re-rate a random sample of clinical records to independently score GAF-symptoms (GAF-S) and GAF-function

(GAF-F). Each clinical record was twice rated by different researchers, blind to each other's rating. A 'not fully crossed' design was used as per recommendations when multiple coders have been involved in ratings (Hallgren, 2012) and Intra-Class Correlations (ICC) between researchers were calculated. The number of participants chosen for this exercise was 15, based on textbook recommendations that 15-20 subjects are adequate for such purposes using a continuous variable (Fleiss, 1986). This resulted in 30 separate duplicate scores (GAF symptom and function score for each participant) for which intra-class coefficients were calculated. This reliability exercise took place at Time 1 and again at Time 2. Coder a (author) was involved in this exercise for both Time 1 and Time 2. Coder b and c were involved in Time 1 follow-up scoring and coder d was involved in the Time 2 follow-up ratings only. All coding pairs achieved excellent intra-class correlation > 0.90 (Cicchetti, 1994) indicating that there was a high degree of agreement when independent GAF ratings for the same participant were compared (See Table 5 for the paired reliability coefficients from these analyses).

Table 5: Inter-rater agreement for GAF ratings from psychiatric clinical records

	GAF SYMPTOMS		GAF FUNCTION	
	Coder A	Coder B	Coder A	Coder B
Subject 1				
Subject 2				
Subject 3		ICC=1.000		ICC=.997
Subject 4				
Subject 5				
	Coder B	Coder C	Coder B	Coder C
Subject 6				
Subject 7				
Subject 8		ICC=.987		ICC=.997
Subject 9				
Subject 10				
	Coder A	Coder D	Coder A	Coder D
Subject 11				
Subject 12				
Subject 13		ICC=.917		ICC=.995
Subject 14				
Subject 15				

ICC = intra-class correlation

It was also necessary to measure the consistency of GAF scores rated from clinical records alone compared with GAF scores rated primarily through direct clinical interview. For this exercise, duplicate GAF ratings were independently rated for 25 participants (approximately 30% of Time 2 sample). This figure was the number of participants who had a clinical interview at Time 2 follow-up and also had detailed clinical records within the same one-month period as interview. This author (Coder A) generated a GAF score for symptoms and a GAF score for function via the clinical records only, blinded to the GAF rating scored based on direct clinical interview within the same time period by another researcher (Coder E). An intra-Class Correlations (ICC) between Coder A and Coder E was calculated and suggests

that GAF scores collected from clinical records and GAF scored via face to face interview showed high comparability (ICC=.81) (Cicchetti, 1994)

Correlation Analysis

Table 6 reports the preliminary analyses of Pearson's and point bi-serial correlations (when 1 variable was binary) were conducted for two purposes. The first purpose was to examine relationships between all Time 0 potential confounders with the dependent variables (DV: GAF symptoms and GAF function at Time 2). It was important to account for these relationships before examining the unique main effects of the independent variable in this study (IV: BCIS Cognitive Insight). The second purpose of correlation analysis was to investigate relationships between cognitive variables, to determine whether the BCIS measure is distinct from IQ and the JTC bias, and whether the BCIS subscales correlate differently with these cognitive measures. No corrections for multiple comparisons were applied to these analyses for the following reasons: a) this analysis was exploratory in nature and not hypotheses-driven; b) given that the nature of these analyses was to identify potential confounders, the risk of type II errors (false negative associations) outweighed concerns about type I errors (false positive correlations). The risk of Type I errors was instead reduced by using the size of the correlation as an indicator of value, rather than relying purely on significance testing. Only correlations that were significant at the $p < .01$ and of greater magnitude than .25 were entered into subsequent regression modelling, as per prior recommendations (Cohen, 1992).

Table 6: Correlation Matrix

	BCIS CI	BCIS SR	BCIS SC	GAF T2 Symptoms	GAF T2 Function	GAF T0 Symptoms	GAF T0 Function	Admission Days	PANSS P	PANSS N	PANSS G	Diagnosis ^a	JTC Bias	IQ	Gender	Ethnicity ^b	Age	UK educated
BCIS CI	1.00																	
BCIS SR	.834**	1.00																
BCIS SC	-.744**	-.251	1.00															
GAF T2 Symptoms	.151	.237	.021	1.00														
GAF T2 Function	.270	.218	-.214	.668**	1.00													
GAF T0 Symptoms	.035	-.099	-.179	.040	.158	1.00												
GAF T0 Function	.255	-.298**	.121	.204	.414**	.566**	1.00											
Admission Days	-.165	-.210	.044	-.121	-.143	.071	.057	1.00										
PANSS P	-.331**	-.158	.391**	-.136	-.303**	-.304**	-.388**	.145	1.00									
PANSS N	-.175	-.155	.120	-.320**	-.329**	-.329**	-.214	.091	.133	1.00								
PANSS G	-.212	-.085	.271**	-.104	-.226	-.236	-.224	-.027	.522**	.402**	1.00							
Diagnosis ^a	.091	.019	-.137	.294**	.297**	.075	.158	-.168	-.047	-.257	-.017	1.00						
JTC Bias	.164	.029	-.313**	-.142	-.054	.185	.200	-.193	-.249	-.064	-.129	.034	1.00					
IQ	.206	.033	-.258	.097	.226	-.097	.115	-.131	-.124	-.303**	-.174	.106	.229	1.00				
Gender	.132	.142	-.060	.119	.311**	-.125	-.063	-.099	-.093	-.141	-.008	.112	.082	.110	1.00			
Ethnicity ^b	-.296**	-.244	.244	-.164	-.392**	-.157	-.180	.159	.144	.065	.052	-.116	.024	-.285**	-.147	1.00		
Age	-.035	-.020	.038	-.096	-.038	.027	-.090	-.277	-.031	-.171	-.055	.080	-.004	.011	.003	-.011	1.00	
UK educated	-.127	.004	.226	.097	-.068	.136	.201	.038	.050	.000	.015	.035	-.209	-.286**	-.100	.320**	.038	1.00

Pearson's and point bi-serial correlations between possible cognitive, clinical and demographic confounders

**Correlation is significant at <0.01 level (2-tailed) ^a affective vs. non-affective psychosis ^b white British/European vs. other.

Identifying confounder variables

GAF symptom scores at Time 2 follow-up were significantly correlated with Time 0 negative symptoms and diagnosis, such that less-severe negative symptoms and an affective diagnosis at psychosis onset was associated with decreased psychopathology at five year follow-up. The number of psychiatric admission days during follow-up did not correlate with any other Time 0 factors (including cognitive variables) to a significant $p < 0.01$ level. Therefore, this measure was not used as a dependent measure of illness severity.

GAF function at Time 2 correlated significantly with six Time 0 variables including: GAF function, ethnicity, gender, negative symptoms, positive symptoms and diagnosis. Specifically, better social and vocational function at five years was associated with better functioning at study entry, being white, female, having less severe negative and positive symptoms at onset and having an affective psychiatric diagnosis.

Relationships between cognitive variables

The self-reflective scale (SR) and the self-certainty scale (SC) scales were negatively correlated, such that those who scored high on the self-reflective items of the BCIS scale also scored low on self-certainty items. However, the strength of this correlation was weak (Cohen 1992). Analysis also showed that the two subscales related differently to other cognitive variables measured in this study. The self-certainty scale had a significant, though weak correlation with the JTC variable, such that higher self-certainty was associated with a tendency to jump to conclusions. The self-certainty scale was also significantly correlated with IQ. JTC response and IQ

were correlated, such that lower IQ was associated with increased endorsement of the JTC bias (a tendency to jump to conclusions). Neither IQ nor the JTC measure was significantly correlated with the BCIS self-reflective scale.

Main Findings

Hypothesis 1

Cognitive Insight (as measured by BCIS composite score) will predict medium-term (five-year follow-up) symptom severity after controlling for the JTC bias.

A hierarchical multiple regression was conducted with GAF symptoms at five years as the dependent variable and the BCIS composite score as the independent variable (IV). Other variables that were highly correlated with the dependent variable (DV) were also entered into the regression model (negative symptoms, diagnoses). The aim of this analysis was to determine how predictive the BCIS composite score (Cognitive Insight) was, after accounting for the effects of other significant Time 0 variables. Against expectations, the JTC variable did not correlate to a significant level with symptom severity at Time 2 ($r = -.142$, $p = .197$) and therefore was not entered into this predictor model.

Data used in this analysis conformed to the multi-collinearity requirements for regression analysis. Collinearity of predictor variables was low (tolerance >0.9), indicating that 90% of variance in the predictor variable, was unique to individual variables entered. To further protect against multi-collinearity, only variables with DV correlations significant at the <0.01 level, at a magnitude at $>.25$ were entered into the model. Visual inspection of residual and scatter plots suggests that assumptions of

normality, linearity and equality of variances were met and no unusual data exerted undue leverage to the model (Cook's largest $d=.111$) (Cook & Weisberg, 1982). Negative symptoms (PANSS) and diagnosis (affective vs. non-affective) were entered together in step 1 as they both represent clinical predictors of outcome in the FEP literature (Menezes, *et al.*, 2006). The IV (BCIS composite score), was entered in the second step of the regression. This predictor model was significant and negative symptoms, diagnosis and the BCIS composite score, accounted for approximately 15% of variance in medium-term symptoms severity $F(3,79)=4.797, p=0.002$. The addition of the BCIS composite score at Step 2 accounted only for 0.6% of variance which was not a significant contribution to the model $F(3,79)=.585, p=0.447, R^2=.148$, adjusted $R^2=.115$).

Post-hoc analyses were carried out to examine the effects of the BCIS subscales separately, in light of their differential correlates (see section: relationships between cognitive variables). Therefore, another hierarchical regression model was created: negative symptoms (PANSS) and diagnoses (affective vs, non-affective) were entered at step 1, and the two BCIS scales (self-reflection and self-certainty) were entered together at step 2. This overall model was significant $F(4,78)=5.258, p=0.046$. The BCIS subscales contributed to a significant increase in variance explained from 15% to 21.5% (adjusted $R^2=.172$). Specifically, higher scores on the self-reflective scale predicted significantly better mental health function at Time 2 follow-up ($t(78)=2.324, p=.023$). The self-certainty scale did not contribute a significant amount of variance to symptom outcome ($t(78)=1.57, p=.199$). Table 7 reports the unique contribution of each variable entered into this model following post-hoc analyses.

Table 7: Hierarchical regression to predict symptom severity at Time 2

	Std β	t	p
Time 0 negative symptoms	-0.247	-2.356	0.021
Diagnoses ^a	0.247	2.378	0.020
BCIS self-reflective scale	0.245	2.324	0.023
BCIS self-certainty scale	0.167	1.577	0.119

^aaffective vs. non-affective psychosis

Hypothesis 2

Cognitive Insight (as measured by the BCIS composite score) will predict medium-term (five-year follow-up) functional disability after controlling for IQ.

A hierarchical multiple regression was carried out with GAF function at five years as the dependent variable (DV) and the BCIS composite score as the predictor variable (IV). Against expectations, IQ did not correlate with GAF function at Time 2 to the threshold set for inclusion into regression models ($r=.226, p=0.05$). Instead, GAF function correlated significantly ($r>.25, p<0.01$) with six other Time 0 variables, which were entered into this regression model. The Time 0 variables entered were as follows: ethnicity, gender, GAF function, negative/positive symptoms (PANSS), diagnosis and the BCIS composite score.

Collinearity of predictor variables was low (tolerance >0.75). Visual inspection of residual and scatter plots suggest that assumptions of normality, linearity, and equality of variances were met and no unusual data exerted undue leverage to the model (Cook's largest $d=.083$). Variables were entered separately according to conceptual categories: demographic factors were entered in step 1, clinical characteristics and function at step 2, and the IV (BCIS composite score) at step 3.

This predictor model was significant and accounted for 40% of variance in function at five years $F(7,74)=6.902, p<0.001$. Demographic factors (gender and ethnicity) explained 19% of variance in functional disability at Time 2 $F(2,79)=9.255, p<0.001; R_2=.19, \text{adjusted } R_2=.169$. Another 20% of variance in functional outcome was explained by clinical/functional characteristics $F(6,75)=8.153, p<0.001; R_2=.395, \text{adjusted } R_2=.346$. The BCIS composite score did not contribute significantly to the

model $F(7,74)=.032$ $p=0.859$ $R^2=.395$, adjusted $R^2=.338$. Also post hoc examinations of the two BCIS scales separately did not make a significant difference to predictor model $F(8,73)=.281$ $p=0.756$ $R^2=.399$, adjusted $R^2=.334$.

Individual contributions of each Time 0 variable entered in this model (following post-hoc analyses) are shown in Table 8. In summary, predictors of decreased functional disability in the medium-term were: white ethnicity, female gender, less severe negative symptoms and better function at first episode.

Table 8: Hierarchical regression to predict function at Time 2

	Std β	t	p
Time 0 GAF function	0.261	2.474	0.016
Ethnicity ^b	-0.234	-2.414	0.018
Gender	0.223	2.347	0.022
Time 0 Negative Symptoms	-0.196	-2.040	0.045
Diagnosis ^a	0.160	1.636	0.106
Time 0 Positive Symptoms	-0.126	-1.230	0.223
BCIS self-reflective scale	0.039	0.389	0.698
BCIS self-certainty scale	0.070	0.700	0.486

^aaffective vs. non-affective psychosis ^b white British/European vs. other.

Hypothesis 3

The relationship between Cognitive Insight and symptom and functional outcome will be stronger in the medium-term (five-year follow-up) compared with the short-term (12-month follow up).

Changes to GAF ratings across time

A useful preliminary to this hypothesis was to examine whether GAF outcome scores changed over the three study time points (Time 0, Time 1 and Time 2) as it was considered unlikely that significant changes to the relationships between Time 0 BCIS scores and GAF outcome would be observed, if outcome itself did not change as a consequence of time. Table 9 displays the mean and change statistics for GAF symptom and function over the three data collection time points (n=85).

Table 9: Cohort's mean GAF symptom and function scores during the study

	Time 0	Time 1 12 months^a	Time 2 5 years^a	F	Sig
GAF: symptoms Mean (sd)	48.90 (20.30)	56.06 (20.03)	63.79(1 6.97)	11.17	< 0.001
GAF: function Mean (sd)	57.43 (16.99)	57.78 (19.97)	61.92 (18.00)	1.774	0.173

^a approximate time frame.

In terms of GAF symptoms, a repeated measures ANOVA showed that symptom severity changed significantly across the three time points $F(2, 168)=11.17$, $p<0.001$. Pair-wise t-tests were carried out to identify where this difference was located across the time points. Compared to Time 0, symptom severity was significant lower at both 12 months and five year follow-up ($t(94)=-2.62$, $p<0.001$; ($t(87)=-4.816$, $p<0.001$ respectively). Symptom severity at five years was also significantly lower than at 12 months ($t(84)=-2.78$, $p=0.007$). By the Time 2 follow-up at five years, the cohort mean GAF symptom score was above recovery thresholds for FEP (>59) (Bertelsen, *et al.*, 2009).

The same statistical analysis was conducted to examine GAF function changes over time. In this instance, no significant differences in GAF function was observed over the three time points $F(2, 166)=1.77$, $p=.173$. However, by five years, the mean functional disability score for the cohort could be defined as above recovery thresholds for FEP (Bertelsen, *et al.*, 2009).

BCIS correlations with recovery across time

Table 10 shows the temporal associations between the BCIS composite score and BCIS subscales with GAF symptom scores. A significant correlation was found between the BCIS composite score and 1 year symptom outcome ($r(95) = .280$, $p=0.006$). However, by Time 2, this relationship had weakened and was no longer significant ($r(90) = .151$ ($p=0.15$)). T test calculations using Steiger's Z (1980) to detect the difference between correlations for non-independent groups showed that

the difference between BCIS- recovery correlations at Time 1 and Time 2 is not statistically significant $Z_H=0.98, p=.326$.

Post-hoc correlations were carried out on the two BCIS scales individually for exploratory purposes. This analysis revealed that self-reflectiveness was significantly correlated with symptom outcome at 12 months and five years such that greater ability to self-reflect was associated with better mental health function prospectively, although not cross-sectionally, at Time 0. Conversely, self-certainty did not correlate with symptom outcome at Time 1 or Time 2 although its relationship with symptoms cross-sectionally at Time 0 was nearing significance (higher self-certainty at illness onset was associated with greater symptom severity at onset).

In terms of the relationship between the BCIS and functional recovery over time, a moderate correlation between the BCIS composite score and function was found at 12 months ($r=.25, p=0.013$) and by five years, this correlation appeared stronger ($r=.27, p=0.010$). T test calculations using Steiger's Z (1980) shows that this change in the strength of the relationship between BCIS and function is not statistically significant $Z_H=-.17, p=0.86$. Inspection of the individual BCIS subscales shows that the self-certainty and self-reflective scales have a different pattern of association with GAF function over the time-points. Specifically, the self-certainty scale showed a significant cross sectional relationship with GAF function, whereas the self-reflection scale showed a prospective relationship with recovery.

Table 10: Pearson's correlations between BCIS subscales and GAF ratings

	GAF Symptoms			GAF Function		
	Time 0	Time 1	Time 2	Time 0	Time 1	Time 2
BCIS subscales						
Composite Index	.03	.28***	.15	.25**	.25**	.27**
Self-Reflective items	-.09	.29***	.25**	.12	.25**	.21**
Self-Certainty items	-.18*	.14	.021	-.298***	-.142	-.21*

*Nearing significance <0.08 **significant at 0.05 *** significant at 0.01

DISCUSSION

Overview

This study prospectively evaluated the relationship between Cognitive Insight, as measured by the Beck Cognitive Insight Scale (BCIS) and recovery in a first episode psychosis (FEP) sample. It was expected that good Cognitive Insight (high self-reflectiveness, and low self-certainty) would predict better medium-term recovery (five years) after the onset of psychotic illness. It was also expected that the magnitude of the relationship between good Cognitive Insight (a high BCIS composite score) and recovery would increase over time, as illness trajectories became more stable and discrete. Recovery was operationalised in this study as symptom severity and level of functional disability, to enable relationships between recovery *type* to be examined. In this chapter, the main findings will be considered in relation to Garety's cognitive model of psychosis (Garety, *et al.*, 2001) and the illness course literature, which underpins the hypotheses. Following this, the clinical implications of the study will be discussed. In closing, the limitations of this study and recommendations for future research will be described.

Hypothesis 1

Cognitive Insight (as measured by BCIS composite score) will predict medium-term (five-year follow-up) symptom severity after controlling for the JTC bias.

The BCIS composite measure did not predict symptom recovery in the medium-term as was expected. Post-hoc analysis of the two subscales of the BCIS

(self-reflection and self-certainty) revealed that only responses on the self-reflective scale prospectively predicted severity of symptoms in the medium-term; participants who endorsed highly self-reflective behaviour (i.e. greater agreement with scale items such as “*even though I feel strongly I am right, I could be wrong*” or “*some of my experiences that have seemed very real may have been due to my imagination*”) had fewer and less severe psychotic symptoms at five years after psychosis onset, compared to those individuals who did not endorse these items. Measures of confidence in judgement (BCIS self-certainty scale and JTC bias) did not contribute to symptom outcome at five years after FEP, though both these factors correlated significantly with each other, and IQ.

These findings contradict previous studies, which found that the correlation between the BCIS composite score and symptom outcome is stronger than the correlation between self-reflective scores and symptom outcome (Bora, *et al.*, 2007; O’Connor, *et al.*, 2013; Perivoliotis, *et al.*, 2010). However, previous studies have only examined the cross-sectional and short-term prospective relationships between the BCIS scales and symptom outcome. This is the first study to examine the BCIS and its relationship with recovery in the medium-term (3 to 7 years) after FEP and to show empirically a unique association between self-reflection and symptom outcome. This finding implies a predictive role for the self-reflective construct that has previously been supported in established psychosis only. For example, findings from a CBT for psychosis (CBTp) trial shows that pre-treatment self-reflectiveness predicts positive treatment response, in terms of reduced symptoms at the end of treatment (Perivoliotis, *et al.*, 2010).

Analysis for hypothesis 1 also revealed other illness onset predictors of symptom recovery. Less severe and fewer negative symptoms at Time 0 predicted decreased overall symptom severity at follow-up, which replicates well-established findings in FEP (Huber, *et al.*, 2008; McGlashan 1988; Ram, *et al.*, 1992). Furthermore, those participants diagnosed with an affective psychosis experienced decreased symptom severity at Time 2 compared with participants with a schizophrenia-spectrum diagnosis, which is consistent with findings from a comprehensive review of FEP outcome studies (Bromet, *et al.*, 2005). All three significant predictor variables in this model (negative symptoms, diagnoses and self-reflection) contributed approximately the same proportion of variance to outcome. Hence, they are equally valuable prognostic indicators.

The null findings regarding the self-certainty BCIS subscale and symptom recovery concur with findings from previous FEP samples (Buchy, *et al.*, 2009; Tranulis, *et al.*, 2008) and are different to findings in established psychosis which show a positive relationship between these variables (Bora, *et al.*, 2007; Pedrelli, *et al.*, 2004). This finding therefore supports speculation made in the introduction chapter (see self-certainty section) that this measure may operate differently in FEP than it does in established psychosis. Only two prior studies have examined the relationship between the JTC bias and symptom severity prospectively in an FEP sample (Dudley, *et al.*, 2013; Falcone, *et al.*, in press), and they both found that the JTC bias predicted increased symptom severity, although *only* in cases where this bias is present across time. Unlike previous FEP studies, this study found no relationship between the JTC bias and later symptom recovery, although this study only measured the JTC construct at Time 0, and not at follow-up. Had the JTC been measured at

follow-up in this study, a sub-set of stable beads task ‘jumpers’ may have been identified, and a positive relationship between JTC and symptom outcome may also have been found. However, the null findings in relation to JTC suggest it is not stable across the FEP population and rather both trait and state characteristics underlie this construct (Moritz & Woodward, 2005). This variability underlying the JTC bias precludes its usefulness as an independent predictor of recovery in a heterogeneous FEP sample.

This was the first study to examine the self-certainty scale alongside the JTC measure to predict global outcomes in FEP over time; one particularly interesting finding emerged with this analysis which was the converging associations between JTC, self-certainty and IQ (and converse lack of association between these variables and symptom outcome). This provides supporting evidence that these measures are tapping into the same ‘confidence in judgement’ reasoning construct and also supports a growing body of evidence that reasoning processes are implicated by lower-order cognition (Falcone, *et al.*, 2014; Lincoln, *et al.*, 2010; Nair, *et al* 2014).

Theoretical context of findings

Garety's cognitive model (2001) proposes that meta-cognition and reasoning processes (both of which are, arguably, indexed by the BCIS) are involved in the maintenance of positive psychotic symptoms over time; and findings from this hypothesis are relevant to Garety's model in two important ways. Firstly, in support of the model, findings in this study provide evidence for a conceptual distinction between meta-cognition and reasoning processes, as the self-reflective and self-certainty subscales of the BCIS showed separate neuropsychological and clinical correlates. Secondly, in terms of which higher-order cognitive variables maintain

psychosis over time, results suggest that meta-cognition (self-reflectiveness) has better prospective value than reasoning processes (self-certainty and JTC) for predicting symptom outcome in FEP. These findings challenge the recommendation in the original BCIS publication to yield a Cognitive Insight composite score, at least for the purposes of predicting prospective symptom outcome in FEP (Beck, *et al.*, 2004).

Hypothesis 2

Cognitive Insight (as measured by the BCIS composite score) will predict medium-term (five-year follow-up) functional disability after controlling for IQ.

The BCIS composite score did not predict level of social and vocational disability in the medium-term, as measured by GAF function. Nor did the subscales (self-reflective or self-certainty) predict function when entered into a regression model separately. Similarly, IQ did not associate with functional outcome in this sample. Instead, predictors of reduced functional disability over time in this study were: high functioning at illness onset; fewer negative symptoms; being female; and identifying as of white ethnic descent. The null findings in this study between cognitive variables and disability suggest that functional recovery operates differently in FEP than in established psychosis. Indeed, while the relationship between the BCIS composite score and functional outcome has scarcely been examined, a positive association has only ever been found in an established psychoses sample (Favrod, *et al.*, 2008). In FEP, Cognitive Insight has already been shown to have no prospective relationship with functional impairment in the short-term (O'Connor, *et al.*, 2013) and now this study replicates these null findings in the medium-term.

This study accounted for IQ because of a vast literature supporting a relationship between this variable and functional outcome in psychosis (Green, 1996, Green, *et al.*, 2000; 2004). However closer analysis of FEP only samples reveals that 58% of studies report no relationship between these variables (Allott, *et al.*, 2011). Some studies that do identify a relationship between IQ and functional recovery in FEP fail to control for demographic factors (Fujii & Wylie, 2002; Jaeger & Douglas, 1992; Yamazawa, *et al.*, 2008). Further, there is a significant overlap in the predictive power of negative symptoms and IQ in FEP (Milev, *et al.*, 2005) and in this analysis; it is possible that the IQ contribution to variance in functional outcome was wholly accounted for by negative symptoms.

The association between white ethnicity and better functional outcome in this study is consistent with literature on social adversity and psychosis. For example, a large UK epidemiological study reported more risk indicators of social disadvantage and isolation for FEP participants of Black Caribbean ethnic background, than for white British FEP participants (Morgan, *et al.*, 2008). An adjunct analysis in this study did not show any association between being brought up in the UK and better functional outcomes in FEP. This finding suggests that the disadvantage of non-white ethnicity for functional recovery may not be due to barriers of language, culture or the impact of migration, but may be better understood as arising from actual or perceived discrimination in black and ethnic minority populations. Indeed this is consistent with explanations of ethnic associated disadvantage in psychosis from previous studies (Berg, *et al.*, 2011; Cooper, *et al.*, 2008; Veling, Hoek., Wiersma, Mackenbach, 2009).

The South London catchment area in which this study was conducted is estimated to be populated by approximately 50-60% of black and minority ethnicities;

a high percentage of which are of African-Caribbean background (Office for National Statistics, 2012) and people who identify as African-Caribbean in the UK do report a higher degree of ethnic discrimination than other ethnic minorities (Cantor-Graae & Selten 2005; Karlsen, Nazroo, McKenzie, Bhui & Weich 2005). That non-white ethnicity was uniquely associated with worse functional disability and not psychopathology in this study raises the possibility that different psychosis-related risk factors operate across ethnic populations. For instance, despite being diagnosed more frequently with psychosis disorders in the UK (Fearon, *et al.*, 2006) African-Caribbean individuals' with psychosis are 40% less likely than white British counterparts to experience continuous psychotic illness (McKenzie, *et al.*, 2001) and have less enduring negative symptoms over the long term (18 years after illness onset) (Takei *et al.*, 1998). These findings substantiate the notion that the development of psychosis in non-white populations in the UK might be related to increased exposure to social risk (i.e. paranoia tendencies because of previous discrimination, rather than genetic risk and developmental impairment). Therefore, poorer socio-vocational outcomes observed for non-white participants in the current study may reflect broader social inequality, rather than disability associated with psychotic illness *per se*.

The positive association found between being female and having better functional outcome as rated by GAF is consistent with previous FEP research (Cotton, *et al.*, 2009; Faerden, *et al.*, 2013; O'Connor, *et al.*, 2013). It has been suggested that the impact of gender can be explained by the tendency for women to be more commonly diagnosed with affective diagnoses (Køster, Lajer, Lindhardt, & Rosenbaum, 2008) which in itself has been found previously to be a predictor of good functional outcome (Riechler-Rossler & Rossler, 1998). However in this study, the

association between female gender and better function was direct and independent of diagnosis. One could speculate that the cause of this association is that women are better able and willing to help-seek than men. For instance, women in the general population are better informed about the early signs of psychosis and pathways to care (Cotton, Wright, Harris, Jorm & McGorry, 2006), they have better social support networks at the onset of psychosis (Willhite, *et al.*, 2008) and are more compliant with treatment recommendations (Thorpe, *et al.*, 2014). Female gender is also likely to be imbedded within a larger network of protective factors in psychosis. For instance, help-seeking and female gender are independently known to reduce duration of untreated illness (DUP), which is another well-known predictor of recovery in FEP (Apelldorn, *et al.*, 2014; Malla, *et al.*, 2002b; Morgan *et al.*, 2006). Therefore, it is likely that the cumulative impact of gender-correlated protective factors, that were *not* tested in this study are likely to have compounded this positive association with functional recovery.

Theoretical context of findings

Garety's cognitive model (2001) does not specify the role of cognition in determining functional disability in psychosis. The rationale for this hypothesis was instead driven by the lack of research examining higher-order cognitive function and functional recovery in the FEP population (Alott, *et al.*, 2011; Riggs, *et al.*, 2012). The null findings in this study suggest that Cognitive Insight, IQ, or the BCIS subscales individually, do not predict functional recovery course in early psychosis, although these measures may be relevant predictors of function in established psychosis samples. The overall findings from this hypothesis also highlight how symptom and functional trajectories are influenced by different factors and replicates

findings of a previous examination of this sample, which showed that cognitive factors predict symptom recovery, while demographic factors predict functional outcomes (O'Connor, *et al.*, 2013).

Hypothesis 3

The relationship between Cognitive Insight (BCIS composite score) and recovery (symptom and function) will be stronger in the medium-term (five-year follow-up) compared with the short-term (12 month follow-up).

A supplementary and exploratory hypothesis in this study examined whether the magnitude of the relationship between Cognitive Insight and recovery would increase over time. Findings in relation to function and symptom recovery will be considered separately.

Cognitive Insight and functional change over time

The level of functional disability in this cohort was stable across the three time-points of the study, which is understandable given that stable demographic factors largely contributed to variance in functional outcome (see hypothesis 2). The finding that GAF function is stable over time is also in agreement with meta-analysis of FEP outcome studies which show no proportional change in functional recovery as measured by the GAF, according to length of follow-up duration (Menezes, *et al.*, 2006). The decision to examine change in the magnitude of the relationship between the BCIS composite score and function over time, was driven by the fact that this relationship has been examined in this sample in the short-term (O'Connor, *et al.*,

2013) but it had never been examined in the medium-term. Also given that functional trajectories can take years to stabilise after illness onset (McGlashan, 1988), it was speculated that relationships between these variables may change over time. However no significant changes to the Cognitive Insight and function relationship emerged. While Cognitive Insight was significantly correlated with function at 12 months, and five years, these pairs of correlations were not significantly different from one another, and Cognitive Insight was not a significant predictor of function in regression modelling. This analysis provided more conclusive evidence that higher-order cognitive factors are not useful prognostic indicator of functional disability in FEP.

Cognitive Insight and symptom change over time

Consistent with a meta-analysis of recovery in FEP (Menezes, *et al.*, 2006), symptom severity decreased over time in this study. The correlation between Time 0 Cognitive Insight and symptom severity at Time 1 (one year after FEP) was significant, which replicates previous findings (O'Connor, *et al.*, 2013). The relationship between the Time 0 Cognitive Insight and symptom severity at Time 2 (five years after FEP) was no longer significant. However, the magnitude of the relationship between Cognitive Insight and symptom recovery was not significantly different across the two time-points.

Through post-hoc analysis of the BCIS subscales (self-reflectiveness and self-certainty), findings emerged which suggest a complex longitudinal relationship between the individual BCIS scales and recovery status. Low self-certainty responses on the BCIS, showed a trend-level relationship with decreased symptom severity when symptoms were most acute (Time 0), and showed no prospective relationship with later symptom recovery. In contrast, self-reflective scores showed no cross-

sectional relationship with symptom outcome, and showed a prospective and stable relationship with symptoms over time (Time 1 and Time 2). These findings are consistent with a different GAP project (using the same Time 0 sample) which found a significant correlation between self-certainty scores and PANSS positive symptoms cross-sectionally, whereas self-reflective item scores did not associate with positive symptoms (Wiffen, 2011). These findings are also consistent with a similarly designed study, which used a symptom specific meta-cognitive measure (belief flexibility around current delusional ideas) to compare against a reasoning construct (JTC bias). This study found that the presence of a marked reasoning bias predicted greater symptom severity cross-sectionally (specifically, delusional conviction), however over time, this association was largely mediated by meta-cognition (So, *et al.*, 2012). Taken together, these findings indicate that meta-cognitive ability such as self-reflection is a trait like characteristic, independent of symptom fluctuation. On the other hand, reasoning processes such as ‘confidence in judgement’ are more fluid and perhaps influenced by the moment to moment experience of positive symptoms.

Theoretical context of findings

No other research study has examined whether the association between the BCIS and recovery varies over multiple time-points. The impetus to do so was driven from the clinical stage-model, which proposes that the predictive value of variables may change according to the clinical phase of illness (McGorry, *et al.*, 2010). This staging model is supported by meta-analysis findings that first-order cognitive factors at illness onset, differentiate in their predictive capacity from short-term to medium-term recovery phases (Alott, *et al.*, 2011; Carlsson, *et al.*, 2006). The findings from this hypothesis support the idea that higher order cognitive constructs can differ in

their relationships with symptom outcome across recovery phases, such that an aspect of cognitive reasoning (self-certainty) has a mixed, unstable relationship with symptoms, whereas the ability to self-reflect might influence the endurance of psychopathology over time. This finding supports the tentative supposition of Garety's cognitive model, that impaired meta-cognition underlies the risk for psychotic symptoms, whereas reasoning processes are related to moment to moment appraisal of symptom experience (Garety, *et al*, 2001).

Study Limitations

This study has several limitations, specifically in relation to sampling bias, data collection procedures and the selection of measures. The details of these will be described in the section below.

Sampling and Generalisability

This study could be criticised for its sample heterogeneity, as this may have reduced the sensitivity of the study to detect relationships between key variables. Indeed, criteria for inclusion required only one week of psychotic symptoms, which resulted in eight different diagnoses across the sample, and 13% of the sample were ascribed with a diagnosis of 'psychosis not otherwise specified'. It is important to counter this limitation with the following points: a) this label is still a valid psychiatric classification in the most recent psychiatric diagnostic manual (American Psychiatric Association, 2013); b) given the criticism levelled at past research for a pessimistic portrayal of psychosis illness course (as discussed in the introduction) it is important to represent diversity in FEP recovery outcomes; c) psychological models

of psychosis aim to understand symptoms that are evident *across* the psychosis spectrum, and therefore it is becoming more common for researchers to examine features of psychosis in heterogeneous samples (Kempf, Hussain, & Potash 2005; Lake, 2012; van Os, *et al*, 2009).

Another limitation of the study sample concerns representativeness. The attrition rate in this study was approximately 20% by Time 2, which is commensurate with attrition rates in other FEP studies with similar follow-up duration (Menezes, *et al*, 2006). Analysis of Time 0 characteristics suggests that, with one exception, those lost at follow-up did not differ from those retained in the follow-up sample. The exception to this finding was that those participants missing at follow-up did have significantly more severe psychopathology at Time 0 on the GAF symptom measure. It seems unlikely that this difference had an impact upon the final results of the study, as the GAF Time 0 symptom measure was not a confounding variable in final predictor models. However, it does suggest sample bias: intuitively, one could expect that the omission of recovery data of those participants' with more severe symptoms at study entry may have artificially inflated symptom recovery scores in this cohort. Conversely, epidemiological research suggests that acuteness of psychosis at onset actually predicts better recovery outcomes (Jablensky, *et al*, 1992) and that most unrepresentative studies are biased toward retaining information on the most unwell patients (Menezes *et al*, 2006). While the real impact of these missing data can only be speculated, cohort research does unfortunately tend to neglect the outcomes at both extreme ends of the recovery spectrum (the very well and very unwell) (Riechler-Rossler & Rossler, 1998).

Approximately 44% of the eligible patients approached to take part in this study refused participation and it is important to acknowledge that there may be a systematic difference between those patients who consented to take part, and those who did not, which may impact upon the generalisability of these findings to the FEP population. Intuitively, one may expect those who did not complete the BCIS measure to be less cognitively able than those who did, which may have artificially inflated Time 0 BCIS scores. Notwithstanding these limitations, the access to patients and resources available through the GAP project enabled a much larger and well characterised sample than could have been achieved, if this study had been conducted in isolation. Further, qualitative analysis carried out to explore reasons for participation vs. refusal did not identify any systematic selection bias in participant recruitment, and the reasons endorsed for participant refusal were highly (Woodall, *et al*, 2011).

Follow-up procedures

Follow-up assessment occurred when participants were willing to be interviewed, or when clinical records were available, and so did not always occur strictly within the 12 month and five year window. In fact, only a small minority of participants were seen exactly within one month of these follow-up times windows (Time 1= 30% Time 2 = 3.4%). This was a pragmatic approach to data collection aimed at minimising the attrition rate; however it may have subsequently limited the ability to draw conclusions about discrete stages of psychosis recovery. This is particularly relevant to hypothesis 3, whereby the magnitude of difference between BCIS and outcome correlations may have been weakened by a lack of distinct time difference between recovery ratings. Varying follow-up times may also have

impacted upon the utility of the hospital admissions measure used in this study, which was based on an average, rather than actual number of hospitalisation days (to account for different follow-up times). If it had been possible to collect hospital admission days for a set time-frame across the cohort, this variable may have been more valuable, as it is likely to reflect the overall recovery trajectory of individual participants. The GAF follow-up rating on the other hand, can only provide a ‘snapshot’ of recovery status.

Another limitation of follow-up procedures was the impact of multiple researchers upon the consistent and reliable collection of data. In fact, only one researcher (the author) was involved in all three time-points in this study. This involvement of multiple researchers across the study is likely to have reduced a sense of continuity for participants (i.e. the researcher calling a participant to arrange follow-up appointments was unlikely to be the same person who interviewed the participant at previous time-points) and potentially could have made participants reluctant to engage in follow-up interviews. Further, the use of different approaches to collect follow-up information (interview and clinical records) no doubt introduced some error into this study, but was necessary in order to retain a large data-set (only approximately 50% of participants were available for interview at Time 2). Given the context within which this study was undertaken (larger GAP project), it was not feasible for all data to be collected by the same researchers across time, and the procedures used for data collection reflect the flexibility required to conduct such large scale clinical research. Results from inter-rater agreement and convergent validity of the main follow-up measure (GAF) provide some assurance that the

flexible procedures adopted to collect follow-up data has not compromised the legitimacy of the findings.

Providing a neuropsychological context

Establishing the role of the BCIS in a broader neuropsychological model is key to understanding the underlying mechanisms of this measure. This study was limited in the sense that only one index of lower-order neuropsychological function was measured (IQ) and other specific neuropsychological variables which may be better markers of a core cognitive disturbance in psychosis were not measured. The decision not to examine specific lower-order constructs separately in this study was informed by the following considerations: a) this study was more interested in comparing the contribution of higher-order cognitive factors, and so a lower-order cognitive variable was entered as a confounder rather than key variable; b) IQ is an important confounder to account for because it encapsulates many different cognitive functions; c) there is good evidence that lower-order cognitive deficits have become global (i.e. impacting upon IQ) by FEP, though the severity of global deficits may vary (Addington, *et al.*, 2005; Joyce *et al.*, 2005; Rund, 1998; Russell, *et al.*, 1997). Given the rationale for measuring IQ, the author also concedes that one cannot ignore the contentious debate that continues about whether lower-order deficits in psychosis are generalised or specific (Cuesta, *et al.*, 2015; Galderisi, *et al.*, 2009; Riley, *et al.*, 2000). It may have been valuable to measure specific neuropsychological domains, such as executive function and memory, both of which have been forwarded as candidate markers of cognitive disturbance in psychosis (Bilder, *et al.*, 2000; Joyce, *et al.*, 2005; Weikert, *et al.*, 2000). It is unfortunate that the IQ estimate measure used in this study did not index verbal comprehension, or that a verbal memory task was not

assessed. This would have been particularly relevant given that verbal memory function has previously been shown to be more impaired than IQ, in this Time 0 sample (O'Connor, *et al*, 2012), a finding replicated recently in a different large FEP sample (n= 451) (Cuesta *et al.*, 2015). Verbal memories about self may be an important precursor to answering items on the BCIS measure in a meaningful way. Indeed two FEP studies found significant associations between higher Cognitive Insight and better verbal learning and memory (Buchy, Czechowska, *et al.*, 2009; Lepage, *et al.*, 2008). However, it is important to counter this limitation by highlighting that such an investigation may not have directly changed the relationship between the BCIS scales and recovery in this study. Indeed, within the previous 12-month follow-up publication for this sample, neuro-psychological measures of verbal memory, or executive functions did not predict recovery outcomes (O'Connor, *et al.*, 2013).

Accounting for other predictor variables

This study accounted for non-cognitive predictor variables that were known from the literature to have an impact upon recovery from psychosis (symptoms at illness onset, diagnoses and demographic factors) but lacked sufficient statistical power to account for other possible predictors of recovery. Given that regression models in this study accounted for between 21.5 to 40% of variance in recovery, a larger sample size would have enabled more complex and informative predictor models to be constructed. Particular factors that may have been important to account for are; duration of untreated illness (DUP), and 'help-seeking' or social disadvantage, as these pre-morbid factors may have important interactions with predictor variables, particularly those relationships between demographics and function. Accounting for

post FEP treatments could also have been valuable, given that compliance with medication and engagement with psychological treatments is likely to have a positive impact upon recovery. Also, it is possible that these variables mediate the relationship between self-reflective abilities and better symptom recovery.

Definitions of Recovery

Definitions of recovery used in this study took account of different recovery domains, however these measures (GAF) were global and somewhat rudimentary. An alternative approach to measuring recovery in this study, would have been to focus on specific symptom recovery (i.e. experience of particular symptoms such as persistence of delusions or hallucinations over time). In terms of functional recovery, this variable could have been defined in more tangible terms, for instance, by using an index of social inclusion (i.e. relationship status, employment status or participation in community activity). It may also have been valuable to assess recovery in terms of engagement with treatment, by measuring compliance with medication or attendance to arranged meetings with mental health professionals. It would have been worthwhile to have measured more person-centred aspects of recovery such as achievement of personal goals, or subjective quality of life, given that these outcomes are increasingly valued in mental health services (Lieberman, *et al.*, 2008; Liberman & Kopelowicz, 2005; Slade & Hayward, 2007). Indeed, what is defined in this study as positive recovery (i.e. fewer positive symptoms, greater independence), may not agree with all service-users desires for their future. Rather, accounting for subjectivity in recovery definitions in outcome-focused research is important (British psychological society, 2008). One example of the type of outcome measure that would have added value to this study is CHOICE (choice of outcome in CBT for

psychoses) (Greenwood, *et al.*, 2010), which is the first psychometrically sound recovery outcome measure designed to account for service-user derived recovery priorities such as '*feeling in control*', '*having a better understanding of oneself*' or '*finding a better way of relating to others*'. Although this measure is designed specifically for clinical intervention studies (CBTp), adopting similar service-user led outcome measures would have made findings in this study more broadly applicable. Cognitive Insight may have related differently to these types of recovery outcomes, and it would be interesting to evaluate how these personal aspects of recovery compare with researcher-led perspectives on recovery.

Measurement Issues

A modified BCIS scale was used in this study. A seven-point Likert scale, rather than the usual four-point scale, was applied to the questionnaire statements. This amended scale had been used in previous research (O'Connor, *et al.*, 2013). This modification was made in order to improve the consistency of the scales which in the original publication were below a generally accepted alpha threshold for research of .7 (Beck, *et al.*, 2004; Nunnally, 1978). The benefit of such a modification is evidenced by research which shows that inter-item reliability is maximised with a seven-point scale (Alliger & Williams, 1992; Finn, 1972; Preston & Coleman, 2000; Ramsay, 1973). Toward this aim, this modification was a success and the internal consistency of scale items in this study reached an acceptable level (self-reflection=.71, self-certainty=.75) and item correlations with respective subscale totals were significant, with effect sizes within the moderate to high range (.35 to .72) (Cohen, 1992). However, an acknowledged pitfall of this modification is that item

ratings have a greater range in this study than studies that have used the original BCIS scale, which makes comparisons to other studies more challenging.

Psychometric analyses undertaken by the author suggests that the internal consistency of the BCIS scales fall just above commonly accepted statistical thresholds (Nunnally, 1978). This has implications for the precision of findings; namely low reliability increases the risk of type II errors in this study (i.e. risk of failing to identify true associations between the BCIS measured constructs with other variables of interest). Therefore, the current findings should be interpreted cautiously and require replication in future studies, perhaps using different, converging measures of Cognitive Insight, to support the inferences made about current findings.

Clinical Implications

The following section will outline how this main finding of this study could helpfully inform clinical practice. Given the positive findings of hypotheses 1, the role of self-reflection as a clinically valuable construct is examined. Findings in relation to hypotheses 2 are drawn upon to consider how mental health services could better manage functional recovery needs in psychosis.

Measuring self-reflective capacity to tailor psychological treatment

A measure of self-reported reflection may provide a useful treatment screen to identify the extent to which an individual is likely to engage with psychological interventions. Cognitive therapy, on which CBTp is modelled, challenges an individual to distance themselves from symptom experience. Therefore, it certainly

makes sense that an ability to consider one's own fallibility and the ability to generate alternatives (items endorsed on the self-reflective scale) may improve the likelihood of being receptive to key CBT techniques. Also, the ability to reflect on one's own experience has been shown to predict a good therapeutic alliance (Davis, Eicher & Lysaker, 2011). There is a clear clinical priority in identifying individuals that would benefit specifically from CBT interventions as it is still difficult to know how to best match a person to psychological treatment (Shafran, *et al.*, 2009). Poor targeting of suitable individuals for therapy may be reflected in randomised control trial findings that up to 50% of clients partaking in CBTp show limited or no improvement (Garety, Fowler & Kuipers, 2000; Kuipers, *et al.*, 1997) and that the pooled effect size of overall symptom change for CBTp is modest (Hedges' $g = -0.33$) when compared to alternative talking therapies (Juahar, *et al.*, 2014).

Clarification of *who* will benefit from this type of treatment will also help refine therapeutic techniques to best cater for individual needs. For example, while self-reflective individuals may be more likely to engage in CBTp, therapeutic techniques may need to be tailored to better target the distress that a highly reflective client is vulnerable to experiencing. These individuals may be vulnerable to emotional disturbance that arises as a consequence of their psychotic experience. For example, research suggests that increased self-reflection is significantly positively correlated with awareness of delusions (Engh, *et al.*, 2010), and this awareness of one's own faulty thinking may have a secondary effect of increasing depressive rumination. There is already an established association between increased clinical insight in illness in schizophrenia and depressive symptoms (Mintz, *et al.*, 2003) and evidence is emerging that self-reflectiveness as measured on the BCIS scale is also

associated with increased depression in psychosis (Belvederi-Murri, *et al*, 2015; Colis, Steer & Beck 2006; Ekinci, *et al.*, 2012; Warman, *et al.*, 2007). Knowledge that an individual already possesses meta-cognitive ability at the beginning of therapy, may enable clinicians and clients to focus therapy less towards developing an understanding of the psychotic experiences and more upon negative self-evaluation or mood disturbance (Garety, *et al*, 2000).

While those with high self-reflective skills may engage more easily with CBT approaches, individuals with poor self-reflective skills have probably the most to gain from CBT in terms of learning to distance themselves from their psychotic symptoms. Lysaker and colleagues, who have extensively explored meta-cognition in schizophrenia, argue that preliminary input may be required to enable these individuals to access this type of therapy, for instance, encouraging clients to notice mental processes before guiding them to label and interrogate their thoughts. They suggest this may be achieved by encouraging such clients to verbalise past memories and integrate this into a meaningful narrative, as well as practice self-awareness strategies explicitly in sessions (Lysaker & Dimaggio, 2014). Indeed an extended duration of engagement is recommended in CBTp (compared to CBT for emotional disorders) which enables a flexible approach to accommodate the varied psychological needs of clients with psychoses (Jolley, *et al.*, 2015).

Although CBTp is the best evidenced individualised psychological approach for psychosis (NICE guidelines, 2014) other person-based therapies may be better suited to individuals with psychosis who have *particularly* limited self-reflective capacity (Lysaker & Dimaggio, 2014). One such example is Mindfulness-based Therapy (Kabat-Zinn, 1994) given its focus on guiding individuals to become better at

observing their own sensations, and reactions to them. Mindfulness practice aims to draw out meta-cognitive insights into the nature psychosis experiences; enabling an individual to create distance between their sense of 'self' and their observed symptoms. It is this process of distance that is thought to alleviate psychoses-related distress in mindfulness practice (Ellett, 2013) and it is becoming increasingly evidenced that this approach is safe and beneficial for psychosis populations (Chadwick, 2014). In this way, Mindfulness practice appears to have the same therapeutic aim as CBTp (create subjective distance from symptoms), however, it may be viewed as a more experiential, and indirect way of achieve this aim (which may better suit certain individuals). Mindfulness therapy is often conducted in groups (Chadwick, Taylor & Abba, 2005; Jacobson, Morris & Johns, 2011) and group contexts may also be conducive to meta-cognitive insights by virtue of providing opportunity for individuals to reflect upon other people's experiences and compare that to their own experience. The research base for mindfulness is limited, although some early evidence suggests that this therapy is effective at reducing symptoms and improving life function (Chadwick, *et al.*, 2005). However, at this stage it is unclear whether mindfulness is effective *because* it improves self-reflective capacity, or if it is effective for other therapeutic reasons (Chadwick, 2014).

Self-reflection as treatment target in CBTp

It is unclear whether CBTp is effective because it changes the underlying mental structures thought to maintain psychotic symptoms (Garety, *et al.*, 2014) and a challenge for researchers is to identify psychological factors that can be modified through the course of treatment. It is possible that self-reflection is a modifiable

mental structure and that the BCIS self-reflection scale may be a tangible measure of psychosis treatment efficacy. However as this study was not an intervention design, this can only be raised as a matter of speculation. Evidence about the BCIS suggests that the ability to self-reflect may be learnt with therapeutic support, and this might be reflected by change scores on the BCIS measure. For example, psycho-social interventions have been shown to change participant endorsement of the self-reflective scale items, but not endorsement of the self-certainty items (Bora, *et al*, 2007; Granholm, *et al*, 2005). Further, meta-analysis has shown that the self-reflective scale has fewer neuro-correlates than the self-certainty scale (Nair, *et al*, 2013) which is consistent with findings in this study, that IQ is associated with self-certainty, and *not* related to self-reflectiveness. By virtue of its lack of correlation with neuropsychological function in this study, poor self-reflective capacity may well be reversed or remedied through psychological input. Taken together, these findings indicate the value of targeting self-reflection capacity to promote symptom change. Measuring self-reflection alongside symptom fluctuation over time would be one way of shedding light on this process of change.

The findings from this study only provide evidence for rudimentary associations between self-reflection and symptoms, because the symptom measure used for recovery indicated global psychopathology (GAF). The decision to use a global measure of symptom outcome, was based on evidence from prior research, which suggests that Cognitive Insight (which calculates the cumulative impact of different aspects of thinking) is a good predictor of '*overall*' symptomatology, rather than a predictor of specific symptoms (Burton, *et al.*, 2011; Riggs, *et al.*, 2012; Perivoliotis, *et al.*, 2010) . However, given that a relationship to overall symptoms

was only found between one aspect of Cognitive Insight (self-reflection items on the BCIS) it would be a fruitful to examine whether this *specific* aspect of thinking can predict the severity of some specific psychotic symptoms more than others (i.e. hallucinations vs. delusions). The literature would benefit from a more fine-grained approach to examining the relationship between the BCIS self-reflection scale and symptom outcome, with a focus on understanding mechanisms of change between these variables. This may be achieved by using an instrument which assesses the multi-dimensional aspect of symptoms, such as the psychotic symptom rating scale (PSYRATS: Haddock, McCarron, Tarrrier & Faragher, 1999) or the Peters Delusional Scale (Peters, Joseph & Garety, 1999). These tools differ from the GAF measure used in this study, in that they provide an index of specific psychosis symptoms but also measure an individual's *relationship* to symptom experience, such as individual level of distress, conviction and pre-occupation with the experienced symptom.

Understanding the relationship between the BCIS scales and these specific aspects of symptom experience would be particularly informative, and is supported by recent calls for the development of symptom-specific interventions in psychosis (Freeman & Garety, 2014). What is also not clear from these findings is whether self-reflection can predict the severity of some specific psychotic symptoms more than others (i.e. hallucinations vs. delusions). Indeed one previous CBTp intervention found that gains in BCIS self-reflection was associated with clinically significant delusional improvements, and was *not* linked to changes in hallucinations (Perivoliotis, *et al.*, 2010). There is scope for the development of delusion focused treatments, in light of recent meta-analysis which suggests that CBTp in its current form, is less effective at treating delusions, than it is at treating hallucinations (van der Gaag, Valmaggia & Smit, 2014).

Service delivery to target functional impairment

This section so far has focused on the positive association between self-reflection and later symptom severity, and how this finding is relevant to clinical practice. However, the study of functional recovery in this thesis revealed findings that raise important questions about the mental health service remit. Functional impairment in this study was shown to endure over time, and many risk factors for poor functional recovery were identified (functional impairment was almost twice as predictable in this study as was symptom severity). Furthermore, while symptoms improved in this cohort, function impairment did not reduce significantly over time. Given that this recovery domain showed poorer naturalistic recovery, and was more predictable than symptom severity, these findings beg a service delivery question: should mental health services prioritise the targeting of functional impairment rather than symptom improvement? Such thinking has already influenced mental health service provision to some extent, with the creation of community recovery teams, designed to reduce symptom experience *and* promote functional enrichment (British Psychological Society, 2008; Repper & Perkins 2003). While it is assuring that findings in this study support the ongoing need for disability-oriented practice, findings in relation to risk factors for poor functional recovery need further consideration

Significant risk factors for poor functional recovery at five years after psychosis onset in this study included non-white ethnicity and male gender. These risk factors are enduring, as they were also evident at an earlier follow-up with this sample (O'Connor, *et al.*, 2013). This finding suggests that even with an increased focus upon functional impairment within mental health services (Department of

health, 2011) men of black and minority ethnic (BME) status are struggling more with socio-vocational aspects of recovery following psychosis, than their white, female counterparts. Differences in mental health care access and pathway to care is evident across demographic groups, and may help explain this functional inequality. For instance, black, male mental health patients in the UK are less likely to receive a referral from GP services (Morgan, et al., 2005a) and their pathway into mental health services in the UK is more likely to be through compulsory admission, or the criminal justice system (Morgan, et al., 2005b). Further, their social needs are less likely to be taken into account in care-planning (Bhui, *et al.*, 2002).

Service providers need to ensure that social and cultural groups that are identified as being excluded from mainstream mental health pathways are given alternative, positive experiences of mental health services. This service gap is currently being met by registered charities such as MAC-UK which is a community psychology enterprise that offers mental health support to young, socially excluded individuals at risk of violence and offending. In place of standardised talking therapies or medication, MAC mental health workers engage young people, ‘on their turf’, collaborating on community projects of the service user’s choosing. The impact of MAC-UK upon functional outcomes is evident: 75% of young people that MAC-UK engages, go on to training, work experience or education (Youth Justice Working Group, 2012). The success of such initiatives highlights how innovative ways of engaging vulnerable client groups can be effective. Such innovative thinking is needed to shape service developments in psychosis health care to reduce exclusion and improve functional recovery outcomes in male BME populations. Such interventions could take multiple forms: forging relationships with BME community

leaders to advocate mental health issues; better education of mental health staff regarding the role that culturally-informed shame may play in help-seeking behaviour; and raising health professional's awareness that distress associated with psychosis may manifest differently across gender, social and cultural groups (Rathod, Kingdon, Phiri & Gobbi, 2010). It is also important that current evidenced-based approaches, such as CBTp, are culturally adapted according to published recommendations, to ensure that social/cultural beliefs are incorporated into treatment (Habib, Dawood, Kingdon & Naeem, 2015; Rathod, *et al.*, 2010).

Future Research

This future research section is limited to exploring ideas for future research focused on the main positive finding in this study; that self-reflection is a predictor of later symptom recovery in FEP. It is suggested that a thorough examination of the BCIS self-reflection measure in different contexts is warranted and would improve the current literature base. Avenues for empirical exploration are described below.

Investigating self-reflection and CBTp relevant variables

It is speculated in the clinical implications section of this chapter that individuals with better self-reflective capabilities may be more likely to engage in CBTp. Despite NICE recommendations, only 10% of current UK mental health services deliver CBTp routinely (Jolley, *et al.*, 2015; the Schizophrenia Commission, 2012) and therefore research that identifies psychological predictors of engagement with therapies may improve service delivery. Such research may also clarify the mechanisms through which self-reflectiveness is associated with better symptom

recovery, as was found in this study. For instance, it would be useful to know whether increased engagement in CBTp is a mediator between self-reflectiveness and symptom outcome, or whether the relationship is direct. Another plausible hypothesis is that high pre-therapy BCIS self-reflection predicts better response to ‘hypothetical contradiction’ (a CBTp therapist technique) and belief flexibility, which in turn leads to better response to treatment.

Tracking self-reflection change over time

The BCIS measures were only administered at one time point in this study, which is unfortunate given that hypothesis 3 suggests a complex longitudinal relationship between the BCIS subscales and phase of illness. The literature would certainly benefit from research investigating the stability of both BCIS subscales over multiple time-points, and to closely monitor how sensitive recovery outcomes are to changes in BCIS scores. For instance, the notion that self-reflective capacity may have a fine-grained relationship with delusions (discussed in clinical implications) could be closely monitored, using Experience Sampling Methodology (ESM: Myin-Germeys, Nicolson & Delespaul 2001). ESM is a random time-sampling technique that enables moment to moment thoughts and experiences to be traced over a short period of time, as well as measuring the role of contextual factors (activity, persons present, mood) upon changes to thinking. Researchers could request FEP participants to complete the BCIS self-reflection scale at random times of the day (indicated by ESM random beeper) and also record delusional aspects of thinking across the same time period. This would enable variability of self-reflective scores across time (and contexts) to be monitored, which will inform understanding of its state or trait-like

character. It will also allow temporal changes in the BCIS to be compared with delusional fluctuations, to identify the precise nature of this relationship.

Manipulating self-reflection in an intervention study

If it is the case that self-reflection changes over time, then research needs to go beyond the detection of associations and use designs that can manipulate this construct. The role of self-reflection, as measured on the BCIS in CBTp and other therapies, has been inferred. It has not been directly targeted, however. A treatment program could be implemented, with the objective of increasing introspection and subjective fallibility directly and measuring whether self-reflective capacity can indeed be changed through targeted intervention. A therapy program could be developed either in a single case experimental design, or by comparing this type of intervention to other therapies that have a different focus of change. Evaluating the BCIS self-reflection scale on a regular basis during therapy and observing concurrent symptom change would be an effective way of measuring whether such an intervention was effective.

Validation of the BCIS self-reflection scale

The fact that the BCIS is the only instrument that purports to measure Cognitive Insight has both advantages and disadvantages. On one hand, this allows comparisons across studies and reduces error that is sometimes introduced by measuring a construct in multiple ways (Mintz, *et al.*, 2003), however, it limits opportunity to evaluate whether the BCIS actually measures what it purports to measure. While the self-certainty scale did correlate with an objective measure of reasoning bias (JTC on the Beads Task), no such convergent validity was assessed for

the self-reflective scale. At present, there is no way of verifying whether item responses on the BCIS self-reflective scale converge with the behavioural application of meta-cognition in daily life (i.e. *the act of endorsing self-reflection via a questionnaire may not require self-reflection in the moment*). Therefore, it may be helpful for future research to examine level of agreement between the BCIS and other third party tools of self-reflection, such as the newly developed meta-cognition assessment scale, which measures self-reflective behaviour through examining an individual's narrative discourse (Lysaker, *et al.*, in press).

Conclusion

Through employing a longitudinal design, evidence has emerged in this study which supports a causal role for meta-cognition in the maintenance of psychopathology in early psychosis. That is, the ability to self-reflect *precedes* the experience of symptoms in this sample. The comparison of higher-order cognitive factors (self-reflection and confidence in judgement) in relation to broad recovery outcomes in psychosis is novel, as is the examination of changes to these relationships across different phases of illness course. This research is partially in support of cognitive models of psychosis, and suggests that meta-cognition may be better at predicting future recovery in the FEP than reasoning style. Not only did symptom outcomes significantly improve over a five year period, but it was also refreshing to find that a possibly malleable psychological factor has an impact on symptom recovery. These findings provide an optimistic outlook for recovery, and reveal a potentially important target for psychological intervention. It is hoped that the

findings of this study contribute to an invigorated research interest in self-reflective aspects of cognition in early psychosis.

REFERENCES

- Addington, J., Leriger, E., & Addington, D. (2003). Symptom outcome 1 year after admission to an early psychosis program *Canadian journal of psychiatry*, 48(3), 204-207.
- Addington, J., Saeedi, H., & Addington, D. (2005). The course of cognitive functioning in first episode psychosis: Changes over time and impact on outcome. *Schizophrenia Research*, 78(1), 35-43.
- Alliger, G. M., & Williams, K. J. (1992). Relating the internal consistency of scales to rater response tendencies. *Educational and psychological measurement*, 52(2), 337-343.
- Allott, K., Liu, P., Proffitt, T.-M., & Killackey, E. (2011). Cognition at illness onset as a predictor of later functional outcome in early psychosis: Systematic review and methodological critique. *Schizophrenia Research*, 125(3), 221-235.
- Amador XF, Flaum M, Andreasen NC, Strauss DH, Yale SA, Clark S, Gorman JM (1994) Awareness of illness in schizophrenia, schizoaffective and mood disorders. *Archives of General Psychiatry* 51:826–836
- American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders (DSM)* (4th Ed). Washington, DC: American Psychiatric Association.
- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th Ed.). Washington, DC: American Psychiatric Association.
- Andreasen, N. C., & Olsen, S. (1982). Negative v positive schizophrenia: definition and validation. *Archives of General Psychiatry*, 39 (7), 789-794.
- Andreasen, N. C. (1997). The evolving concept of schizophrenia: from Kraepelin to the present and future. *Schizophrenia Research*, 28(2), 105-109.

- Andreasen, N. C., Arndt, S., Alliger, R., Miller, D., & Flaum, M. (1995). Symptoms of schizophrenia: Methods, meanings, and mechanisms. *Archives of General Psychiatry*, *52*(5), 341-351.
- Andreasen, N. C., Carpenter, W. T., Kane, J. M., Lasser, R. A., Marder, S. R., & Weinberger, D. R. (2005). Remission in schizophrenia: proposed criteria and rationale for consensus. *American Journal of Psychiatry*, *162*(3), 441-449.
- Apeldoorn, S. Y., Sterk, B., van den Heuvel, E. R., Schoevers, R. A., Islam, M. A., & Risk, G. (2014). Factors contributing to the duration of untreated psychosis. *Schizophrenia Research*, *158*(1), 76-81.
- Aylward, E., Walker, E., & Bettes, B. (1984). Intelligence in Schizophrenia: Meta-analysis of the research. *Schizophrenia Bulletin*, *10*(3), 430-459.
- Barnes, T. R. E., Leeson, V. C., Mutsatsa, S. H., Watt, H., Hutton, S. B., & Joyce, E. M. (2008). Duration of untreated psychosis and social function: 1-year follow-up study of first-episode schizophrenia. *British Journal of Psychiatry*, *193*(3), 203-209.
- Basso, M. R., Nasrallah, H. A., Olson, S. C., & Bornstein, R. A. (1998). Neuropsychological correlates of negative, disorganized and psychotic symptoms in schizophrenia. *Schizophrenia Research*, *31*(2), 99-111.
- Beck, A. T., & Clark, D. A. (1997). An information processing model of anxiety: Automatic and strategic processes. *Behaviour Research and Therapy*, *35*(1), 49-58.
- Beck, A. T. (2002). Cognitive models of depression. *Clinical advances in cognitive psychotherapy: Theory and application*, *14*, 29-61.
- Beck, A. T., & Warman, D. M. (2004). Cognitive Insight: theory and assessment. In X. F. Amador & A. S. David (Eds.), *Insight and psychosis: Awareness of illness in schizophrenia and related disorders (2nd edition)* NY: Oxford University Press.

- Beck, A., Baruch, E., Balter, J. M., Steer, R. A., & Warman, D. M. (2004). A new instrument for measuring insight: the Beck Cognitive Insight Scale. *Schizophrenia Research*, 68(2-3), 319-329.
- Belvederi-Murri, M. B., Respino, M., Innamorati, M., Cervetti, A., Calcagno, P., Pompili, M., ... & Amore, M. (2015). Is good insight associated with depression among patients with schizophrenia? Systematic review and meta-analysis. *Schizophrenia Research*, 162(1), 234-247.
- Bensi, L., Giusberti, F., Nori, R., & Gambetti, E. (2010). Individual differences and reasoning: A study on personality traits. *British Journal of Psychology*, 101, 545-562.
- Bentall, R. P., Corcoran, R., Howard, R., Blackwood, N., & Kinderman, P. (2001). Persecutory delusions: a review and theoretical integration. *Clinical Psychology Review*, 21(8), 1143-1192.
- Bentall, R. P., Rowse, G., Shryane, N., Kinderman, P., Howard, R., Blackwood, N. & Corcoran, R. (2009). The cognitive and affective structure of paranoid delusions: a transdiagnostic investigation of participants with schizophrenia spectrum disorders and depression. *Archives of General Psychiatry*, 66(3), 236-247.
- Bentham, A. M. P., McKay, A., Quemada, I., Clare, L., Eastwood, N., & McKenna, P. (1996). Delusions in schizophrenia: a phenomenological and psychological exploration. *Cognitive Neuropsychiatry*, 1(4), 289-304.
- Berg, A. O., Melle, I., Rossberg, J. I., Romm, K. L., Larsson, S., Lagerberg, T. V.,...& Hauff, E. (2011). Perceived discrimination is associated with severity of positive and depression/anxiety symptoms in immigrants with psychosis: a cross-sectional study. *BMC psychiatry*, 11(1),77-86.
- Bertelsen, M., Jeppesen, P., Petersen, L., Thorup, A., Øhlenschläger, J., Le Quach, P., ... & Nordentoft, M. (2009). Course of illness in a sample of 265 patients with first-episode psychosis—five-year follow-up of the Danish OPUS trial. *Schizophrenia Research*, 107(2), 173-178.

- Bilder, R. M., Goldman, R. S., Robinson, D., Reiter, G., Bell, L., Bates, J. A., & Lieberman, J.A. (2000). Neuropsychology of First-Episode Schizophrenia: Initial Characterization and Clinical Correlates. *American Journal of Psychiatry*, 157(4), 549-559.
- Birchwood, M., McGorry, P., & Jackson, H. (1997). Early intervention in schizophrenia. *British Journal of Psychiatry*, 170(1), 2-11.
- Bhui, K. (2002). *Racism and mental health: Prejudice and suffering*. London: Jessica Kingsley Publishers.
- Blakemore, S. J., Smith, J., Steel, R., Johnstone, E. C., & Frith, C. D. (2000). The perception of self-produced sensory stimuli in participants with auditory hallucinations and passivity experiences: evidence for a breakdown in self-monitoring. *Psychological Medicine*, 30(5), 1131-1139.
- Bleuler, E (1950) *Dementia Praecox or the Group of Schizophrenias*. New York: International Universities Press
- Bloom, B. S., Engelhart, M.D., Furst, EJ, Hill, W.H., & Krathwohl, D.R., (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook 1: Cognitive domain*. Longmans: McKay.
- Bodnar, M., Malla, A., Joober, R., & Lepage, M. (2008). Cognitive markers of short-term clinical outcome in first-episode psychosis. *The British Journal of Psychiatry*, 193(4), 297-304.
- Bora, E., Erkan, A., Kayahan, B., & Veznedaroglu, B. (2007). Cognitive Insight and acute psychosis in schizophrenia. *Psychiatry and Clinical Neurosciences*, 61(6), 634-639.
- Bora, E., Yucel, M., & Pantelis, C. (2009). Theory of mind impairment in schizophrenia: meta-analysis. *Schizophrenia Research*, 109(1), 1-9.
- Breier, A., Schreiber, M., Dyer, J., & Pickar, D. (1991). National Institute of Mental Health longitudinal study of schizophrenia. *Archives of General Psychiatry*, 48, 239-246.

- British Psychological Society (2008). *Socially Inclusive Practice*. Leicester:BPS.
Retrieved April 24th 2015 from
http://www.bps.org.uk/sites/default/files/documents/socially_inclusive_practice_discussion_paper.pdf.
- Bromet, E. J., Naz, B., Fochtmann, L. J., Carlson, G. A., & Tanenberg-Karant, M. (2005). Long-Term Diagnostic Stability and Outcome in Recent First-Episode Cohort Studies of Schizophrenia. *Schizophr Bull*, 31(3), 639-649.
- Brüne, M. (2005). "Theory of mind" in schizophrenia: a review of the literature. *Schizophrenia Bulletin*, 31(1), 21-42.
- Buchy, L., Czechowska, Y., Chochol, C., Malla, A., Jooper, R., Pruessner, J., & Lepage, M. (2009). Toward a model of Cognitive Insight in first-episode psychosis: verbal memory and hippocampal structure. *Schizophrenia Bulletin*, 36(5), 1040-1049.
- Buchy, L., Malla, A., Jooper, R., & Lepage, M. (2009). Delusions are associated with low self-reflectiveness in first-episode psychosis. *Schizophrenia Research*, 112(1), 187-191.
- Bhugra, D., Leff, J., Mallett, R., Der, G., Corridan, B., & Rudge, S. (1997). Incidence and outcome of schizophrenia in whites, African-Caribbeans and Asians in London. *Psychologicalmedicine*, 27(4), 791-798.
- Bürgy, M. (2008). The concept of psychosis: historical and phenomenological aspects. *Schizophrenia Bulletin*, 34(6), 1200-1210.
- Burton, C. Z., Vella, L., & Twamley, E. W (2011). Clinical and Cognitive Insight in a Compensatory Cognitive Training Intervention. *American journal of psychiatric rehabilitation*, 14(4), 307-326.
- Carlson, J., Ochoa, S., Haro, J. M., Escartín, G., Ahuir, M., Gutierrez-Zotes, A., ... & Gallo, P. (2009). Adaptation and validation of the quality-of-life scale: Satisfaction with Life Domains Scale by Baker and Intagliata. *Comprehensive Psychiatry*, 50(1), 76-80.

- Cantor-Graae, E., & Selten, J.P. (2005). Schizophrenia and migration: a meta-analysis and review. *American Journal of Psychiatry*, 162(1), 12-24.
- Carlsson., R., Nyman., H., Ganse., G., & Cullberg., J. (2006). Neuropsychological functions predict 1 and 3 year outcome in first episode psychosis. *Acta Psychiatrica Scandinavica*, 113, 102-111.
- Censits., D. M., Ragland., D. J., Gur., R. C., & Gur., R. E. (1997). Neuropsychological evidence supporting a neurodevelopmental model of schizophrenia: a longitudinal study. *Schizophrenia Research*, 24, 289-298.
- Chadwick, P., Taylor, K. N., & Abba, N. (2005). Mindfulness groups for people with psychosis. *Behavioural and Cognitive Psychotherapy*, 33(03), 351-359.
- Chadwick, P. (2014). Mindfulness for psychosis. *The British Journal of Psychiatry*, 204(5), 333-334.
- Cheng, F., Kirkbride, J., Lennox, B., Perez, J., Masson, K., Lawrence, K.,....& Jones., P.B (2011). Administrative incidence of psychosis assessed in an early intervention service in England: first epidemiological evidence from a diverse, rural and urban setting. *Psychological Medicine*, 41(05), 949-958.
- Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment*, 6(4), 284-290.
- Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. In Heimberg., R.G, Liebowitz., M.R., Hope., D.A., Schneier., F.R. *Social phobia: Diagnosis, Assessment, and Treatment* (pp. 69-73). New York: Guilford Press.
- Clark-Carter, D. (2009). *Quantitative Psychological Research: The Complete Student's Companion: The Complete Student's Companion*. London: Psychology Press.
- Cohen, J. (1992) A power primer. *Psychological Bulletin*, 112(1), 155-159.

- Colbert, S. M., & Peters, E. R. (2002). Need for closure and jumping-to-conclusions in delusion prone individuals. *Journal of Nervous and Mental Disease*, 190(1), 27-31.
- Colis, M. J., Steer, R. A., & Beck, A. T. (2006). Cognitive insight in inpatients with psychotic, bipolar, and major depressive disorders. *Journal of Psychopathology and Behavioral Assessment*, 28(4), 242-249.
- Conus, P., Cotton, S., Abdel-Baki, A., Lambert, M., Berk, M., & McGorry, P. D. (2006). Symptomatic and functional outcome 12 months after a first episode of psychotic mania: barriers to recovery in a catchment area sample. *Bipolar Disorders*, (8), 221-231.
- Cook, R. D & Weisberg, S (1982). *Residuals and influence in regression*. New York: Chapman & Hall.
- Cooke, M. A., Peters, E. R., Kuipers, E., & Kumari, V. (2005). Disease, deficit or denial? Models of poor insight in psychosis. *Acta Psychiatrica Scandinavica*, 112(1), 4-17.
- Cooke, M. A., Peters, E. R., Fannon, D., Aasen, I., Kuipers, E., & Kumari, V. (2010). Cognitive Insight in psychosis: The relationship between self-certainty and self-reflection dimensions and neuropsychological measures. *Psychiatry Research*, 178(2), 284-289.
- Cooper, C., Morgan, C., Byrne, M., Dazzan, P., Morgan, K., Hutchinson, G., ... & Fearon, P. (2008). Perceptions of disadvantage, ethnicity and psychosis. *The British Journal of Psychiatry*, 192(3), 185-190.
- Corlett, P. R., Frith, C. D., & Fletcher, P. C. (2009). From drugs to deprivation: a Bayesian framework for understanding models of psychosis. *Psychopharmacology*, 206(4), 515-530.
- Cotton, S., Lambert, M., Schimmelmann, B., Foley, D., Morley, K., McGorry, P., & Conus, P. (2009). Gender differences in premorbid, entry, treatment, and outcome characteristics in a treated epidemiological sample of 661 patients with first-episode psychosis. *Schizophrenia Research*, 114(1), 17-24.

- Cotton, S. M., Wright, A., Harris, M. G., Jorm, A. F., & McGorry, P. D. (2006). Influence of gender on mental health literacy in young Australians. *Australian and New Zealand Journal of Psychiatry*, 40(9), 790-796.
- Crow, T. J. (1980). Molecular pathology of schizophrenia: more than one disease process?. *British Medical Journal*, 280 (6207), 66-68.
- Cuesta, M. J., Sánchez-Torres, A. M., Cabrera, B., Bioque, M., Merchán-Naranjo, J., Corripio, I., ... & Group, P. (2015). Premorbid adjustment and clinical correlates of cognitive impairment in first-episode psychosis. The PEPsCog Study. *Schizophrenia Research*, 164 (1),65-73.
- David, A. (1990). Insight and Psychosis. *British Journal of Psychiatry*, 156, 798-808.
- David, A. (2004). The clinical importance of insight: an overview. In Amador XF. & A. David (Eds). *Insight and psychosis: awareness of illness in Schizophrenia and related disorders* (2nd Ed pp. 359-392). Oxford: Oxford University Press.
- Davis L.W, Eicher AC, Lysaker PH. Metacognition as a predictor of therapeutic alliance over 26 weeks of psychotherapy in schizophrenia. *Schizophrenia Research*. 2011;129:85–90.
- Department of Health (2011) *No health without mental Health : A cross government mental health outcomes strategy for people of all ages 2011*. HM Government, Department of Health. Retrieved from <https://www.gov.uk/government/uploads/system/uploads/attachment>.
- Deary, I. J. (2001). *Intelligence: A very short introduction*. Oxford University Press.
- Dudley, R. E. J., John, C. H., Young, A. W., & Over, D. E. (1997). Normal and abnormal reasoning in people with delusions. *British Journal of Clinical Psychology*, 36(2), 243-258.
- Dudley, R., Shaftoe, D., Cavanagh, K., Spencer, H., Ormrod, J., Turkington, D., & Freeston, M. (2011). ‘Jumping to conclusions’ in first-episode psychosis. *Early Intervention in psychiatry*, 5(1), 50-56.

- Dudley, R., Daley, K., Nicholson, M., Shaftoe, D., Spencer, H., Cavanagh, K., & Freeston, M. (2013). 'Jumping to conclusions' in first-episode psychosis: A longitudinal study. *British Journal of Clinical Psychology, 52*(4), 380-393.
- Dutta, R., Greene, T., Addington, J., McKenzie, K., Phillips, M., & Murray, R. M. (2007). Biological, life course, and cross-cultural studies all point toward the value of dimensional and developmental ratings in the classification of psychosis. *Schizophrenia Bulletin, 33*(4), 868-876.
- Eastvold, A. D., Heaton, R. K., & Cadenhead, K. S. (2007). Neurocognitive deficits in the (putative) prodrome and first-episode of psychosis. *Schizophrenia Research, 93*(1), 266-277.
- Ekinci, O., Ugurlu, G. K., Albayrak, Y., Arslan, M., & Caykoylu, A. (2012). The relationship between cognitive insight, clinical insight, and depression in patients with schizophrenia. *Comprehensive Psychiatry, 53*(2), 195-200.
- Ellett, L. (2013). Person-based cognitive therapy for distressing psychosis. In Morris, E.M.J., Johns., L.C., & Oliver., J.E. *Acceptance and Commitment Therapy and Mindfulness for Psychosis* (pp. 146-159). Chichester: Wiley & Sons, Ltd.
- Endicott, J., Spitzer, R. L., Fleiss, J. L., & Cohen, J. (1976). The Global Assessment Scale: A procedure for measuring overall severity of psychiatric disturbance. *Archives of General Psychiatry Research (33)*, 766-771.
- Engel, G. L. (1977). The need for a new medical model: a challenge for biomedicine. *Science, 196* (4286), 129-136
- Engh, J. A., Friis, S., Birkenaes, A. B., Jonsdottir, H., Klungs Å,yr, O., Ringen, P. A (2010). Delusions Are Associated With Poor Cognitive Insight in Schizophrenia. *Schizophrenia Bulletin, 36*(4), 830-835.
- Evans, J. S. B. (2008). Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology, 59*, 255-278.

- Evans, J.J (2003) Rehabilitation of Executive Functions. In B.A Wilson (Eds.) *Neuropsychological Rehabilitation* (pp 53-70) Lisse: Swets & Zeitlinger B.V.
- Faerden., A., Vaskinn., A., Finset., A., Agartz., I., Barrett., E. A., Friis., S.,...& Melle (2009). Apathy is associated with executive functioning in first episode psychosis. *BMC Psychiatry*, 9(1). Doi:10.1186/1471-244X-9-1
- Falcone, M. A. (2013). *Neuropsychological and symptom correlates of the 'jumping to conclusions' reasoning bias* (Doctoral dissertation) King's College London: UK.
- Falcone, M. A, Murray, R., O'Connor, J, A., Hockey, L., Gardner-Sood., Di Forti., Freeman, D., Jolley, S. (2015) Jumping to conclusions and the persistence of delusional beliefs in first episode psychosis. *Schizophrenia Research*, 165 (2-3), 243-246.
- Falcone, M. A., Murray, R. M., Wiffen, B. D., O'Connor, J. A., Russo, M., Kolliakou, A. & Jolley, S. (2014). Jumping to conclusions, neuropsychological functioning, and delusional beliefs in first episode psychosis. *Schizophrenia Bulletin*, 41(2), 411-418
- Favrod, J., Zimmermann, G., Raffard, S., Pomini, V., & Khazaal, Y. (2008). The Beck Cognitive Insight Scale in outpatients with psychiatric disorders: further evidence from a French-speaking sample. *Canadian Journal of Psychiatry*, 53, 783-787.
- Fearon, P., Kirkbride, J. B., Morgan, C., Dazzan, P., Morgan, K., Lloyd, T., ... & Murray, R. M. (2006). Incidence of schizophrenia and other psychoses in ethnic minority groups: results from the MRC AESOP Study. *Psychological Medicine*, 36(11), 1541-1550.
- Fett, A. K. J., Viechtbauer, W., Dominguez, M. D. G., Penn, D. L., van Os, J., & Krabbendam, L. (2011). The relationship between neurocognition and social cognition with functional outcomes in schizophrenia: a meta-analysis. *Neuroscience & Biobehavioral Reviews*, 35(3), 573-588.

- Field, A. (2009). *Discovering statistics using SPSS*. London: Sage publications.
- Finn, R.H. (1972) Effects of some variations in rating scale characteristics on the means and reliabilities of ratings. *Educational and Psychological Measurement*, 32, 7, pp. 255–265.
- Fleiss, J.L. (1986). *Design and Analysis of Clinical Experiments*. New York: Wiley.
- Fleiss, L., Levin, B., & Paik, M. C. (1981). The measurement of interrater agreement. *Statistical methods for rates and proportions*, 2, 212-236.
- Fine, C., Gardner, M., Craigie, J., & Gold, I. (2007). Hopping, skipping or jumping to conclusions? Clarifying the role of the JTC bias in delusions. *Cognitive Neuropsychiatry*, 12(1), 46-77.
- Flavell, J. H. (1979). Meta-cognition and cognitive monitoring: A new area of cognitive developmental inquiry. *American Psychologist*, 34(10), 906-911.
- Franck, N., Farrer, C., Georgieff, N., Marie-Cardine, M., Daléry, J., d'Amato, T., & Jeannerod, M. (2001). Defective recognition of one's own actions in participants with schizophrenia. *American Journal of Psychiatry*, 158(3), 454-459.
- Freeman, D., & Garety, P. (2003). Connecting neurosis and psychosis: the direct influence of emotion on delusions and hallucinations. *Behaviour Research and Therapy*, 41(8), 923-947.
- Freeman, D., & Garety, P. (2014). Advances in understanding and treating persecutory delusions: a review. *Social psychiatry and psychiatric epidemiology*, 49(8), 1179-1189.
- Freeman, D., Startup, H., Dunn, G., Černis, E., Wingham, G., Pugh, K., ... & Kingdon, D. (2014). Understanding jumping to conclusions in patients with persecutory delusions: working memory and intolerance of uncertainty. *Psychological Medicine*, 44(14), 3017-3024.

- Freeman, D. (2007). Suspicious minds: The psychology of persecutory delusions. *Clinical Psychology Review, 27*(4), 425-457.
- Frith, C. D. (1992). *The cognitive neuropsychology of schizophrenia*: London: Psychology Press.
- Frith, C. D., & Corcoran, R. (1996). Exploring 'theory of mind' in people with schizophrenia. *Psychological Medicine, 26*(03), 521-530.
- Fujii, D. E., & Wylie, A. M. (2003). Neurocognition and community outcome in schizophrenia: long-term predictive validity. *Schizophrenia Research, 59*(2-3), 219-223.
- Fusar-Poli, P., Deste, G., Smieskova, R., Barlati, S., Yung, A. R., Howes, O., ... & Borgwardt, S. (2012). Cognitive functioning in prodromal psychosis: a meta-analysis. *Archives of General Psychiatry, 69*(6), 562-571.
- Galderisi, S., Davidson, M., Kahn, R. S., Mucci, A., Boter, H., Gheorghe, M. D., ... & Fleischhacker, W. W. (2009). Correlates of cognitive impairment in first episode schizophrenia: the EUFEST study. *Schizophrenia Research, 115*(2), 104-114.
- Garety, P. A., Fowler, D., & Kuipers, E. (2000). Cognitive-behavioral therapy for medication-resistant symptoms. *Schizophrenia Bulletin, 26*(1), 73-86.
- Garety, P., Fowler, D., Kuipers, E., Freeman, D., Dunn, G., Bebbington, P.,...Jones., S (1997). London-East Anglia randomised controlled trial of cognitive-behavioural therapy for psychosis. II: Predictors of outcome. *The British Journal of Psychiatry, 171*(5), 420-426.
- Garety, P., & Freeman, D. (1999). Cognitive approaches to delusions: A critical review of theories and evidence. *British Journal of Clinical Psychology, 38*(2), 113-154.
- Garety, P., Freeman, D., Jolley, S., Dunn, G., Bebbington, P., Fowler, G., *et al.*, (2005). Reasoning, emotions, and delusional conviction in psychosis. *Journal of Abnormal Psychology, 114*(3), 373.

- Garety, P., Hemsley, D., & Wessely, S. (1991). Reasoning in deluded schizophrenic and paranoid participants: Biases in performance on a probabilistic inference task. *The Journal of nervous and mental disease*, 179(4), 194-201.
- Garety, P., Kuipers, E., Fowler, D., Freeman, D., & Bebbington, P. (2001). A cognitive model of the positive symptoms of psychosis. *Psychological Medicine*, 31, 189-195.
- Garety, P., & Freeman, D. (2013). The past and future of delusions research: from the inexplicable to the treatable. *The British Journal of Psychiatry*, 203(5), 327-333.
- Garety, P., Waller, H., Emsley, R., Jolley, S., Kuipers, E., Bebbington, P., ... & Freeman, D. (2014). Cognitive mechanisms of change in delusions: an experimental investigation targeting reasoning to effect change in paranoia. *Schizophrenia Bulletin*, 41(2), 400-410.
- Greenwood, K. E., Sweeney, A., Williams, S., Garety, P., Kuipers, E., Scott, J., & Peters, E. (2010). Choice of outcome in CBT for psychoses (CHOICE): the development of a new service user-led outcome measure of CBT for psychosis. *Schizophrenia Bulletin*, 36 (1), 126-131.
- Gold, J. M., & Harvey, P. D. (1993). Cognitive deficits in schizophrenia. *Psychiatric Clinics of North America*, 16(2), 295-312.
- Granholm, E., Auslander, L., Gottlieb, J., McQuaid, J., & McClure, F. (2006). Therapeutic factors contributing to change in cognitive-behavioral group therapy for older persons with schizophrenia. *Journal of Contemporary Psychotherapy*, 36(1), 31-41.
- Gray, C. D., & Kinnear, P. R. (2012). *IBM SPSS statistics 19 made simple*. London: Psychology Press.
- Green, M. (1996). What are the functional consequences of neuro-cognitive deficits in schizophrenia? *American Journal of Psychiatry*, 153(3), 321-330.

- Green, M. F., Kern, R. S., Braff, D. L., & Mintz, J. (2000). Neuro-cognitive Deficits and Functional Outcome in Schizophrenia: Are We Measuring the "Right Stuff"? *Schizophrenia Bulletin*, 26(1), 119-136.
- Green, M. F., Kern, R. S., & Heaton, R. K. (2004). Longitudinal studies of cognition and functional outcome in schizophrenia: implications for MATRICS. *Schizophrenia Research*, 72(1), 41-51.
- Habib, N., Dawood, S., Kingdon, D., & Naeem, F. (2015). Preliminary Evaluation of Culturally Adapted CBT for Psychosis (CA-CBTp): Findings from Developing Culturally-Sensitive CBT Project (DCCP). *Behavioural and Cognitive Psychotherapy*, 43(2), 200-208
- Haddock, G., McCarron, J., Tarriner, N., & Faragher, E. B. (1999). Scales to measure dimensions of hallucinations and delusions: the psychotic symptom rating scales (PSYRATS). *Psychological Medicine*, 29(4), 879-889.
- Häfner, H., Maurer, K., Löffler, W., & Riecher-Rössler, A. (1991). Schizophrenie und Lebensalter.) [Schizophrenia and age]. *Der Nervenarzt*, 62(9), 536-548.
- Hallgren, K. A. (2012). Computing Inter-Rater Reliability for Observational Data: An Overview and Tutorial. *Tutorials in Quantitative Methods for Psychology*, 8(1), 23-34.
- Harrington, L., Siegert, R., & McClure, J. (2005). Theory of mind in schizophrenia: a critical review. *Cognitive neuropsychiatry*, 10(4), 249-286.
- Harrison, G., Hopper, K., Craig, T., Laska, E., Siegal, C., Wanderlink, J., et al. (2001). Recovery from psychotic illness: a 15- and 25-year international follow-up study. *The British Journal of Psychiatry*, 178(6), 506-517.
- Harvey CA, Jeffreys SE, McNaught AS, Blizard RA, King MB (2007). The Camden schizophrenia surveys. III: Five-year outcome of a sample of individuals from a prevalence survey and the importance of social relationships. *International Journal of Social Psychiatry*, 53(4):340-356.

- Heinrichs., R. W., & Zakzanis., K. K. (1998). Neurocognitive deficit in schizophrenia: A quantitative review of the evidence. *Neuropsychology, 12*(3), 426-445.
- Hegarty, J., Baldessarini, R., Tohen, M., Waternaux, C., & Oepen, G. (1994). One hundred years of schizophrenia: a meta-analysis of the outcome literature. *American Journal of Psychiatry, 151*(10), 1409-1416.
- Hemsley, D. (1987). An experimental psychological model for schizophrenia. *Search for the causes of schizophrenia, 1*, 179-188.
- Hemsley, D. R. (1993). A simple (or simplistic?) cognitive model for schizophrenia. *Behaviour Research and Therapy, 31*(7), 633-645.
- Ho, B.C., Nopoulos, P., Flaum, M., Arndt, S., & Andreasen, N. C. (1998). Two-Year Outcome in First-Episode Schizophrenia: Predictive Value of Symptoms for Quality of Life. *American Journal of Psychiatry, 155*(9), 1196-1201.
- Holthausen, E. A., Wiersma, D., Cahn, W., Kahn, R. S., Dingemans, P. M., Schene, A. H., & van den Bosch, R. J. (2007). Predictive value of cognition for different domains of outcome in recent-onset schizophrenia. *Psychiatry Research, 149*(1), 71-80.
- Huber, C. G., Naber, D., & Lambert, M. (2008). Incomplete remission and treatment resistance in first-episode psychosis: definition, prevalence and predictors. *Expert Opinion on Pharmacotherapy, 9*(12), 2027-2038.
- Huq, S., Garety, P., & Hemsley, D. (1988). Probabilistic judgements in deluded and non-deluded subjects. *The Quarterly Journal of Experimental Psychology, 40*(4), 801-812.
- Insel, T. R. (2010). Rethinking schizophrenia. *Nature, 468*(7321), 187-193.
- Jablensky, A., Sartorius, N., Ernberg, G., Anker, M., Korten, A., Cooper, J. E., ... & Bertelsen, A. (1992). Schizophrenia: manifestations, incidence and course in different cultures A World Health Organization Ten-Country Study. *Psychological medicine. Monograph supplement, 20*, 1-97.

- Jackson, H. J., & McGorry, P. D. (2010) The EPPIC follow-up study of first-episode psychosis: longer-term clinical and functional outcome 7 years after index admission. *Journal of Clinical Psychiatry*, 71(6), 716-728.
- Jacobsen, P., Morris, E., Johns, L., & Hodkinson, K. (2011). Mindfulness groups for psychosis; key issues for implementation on an inpatient unit. *Behavioural and Cognitive Psychotherapy*, 39(03), 349-353.
- Jolley, S., Garety, P., Peters, E., Fornells-Ambrojo, M., Onwumere, J., Harris, V. & Johns, L. (2015). Opportunities and challenges in Improving Access to Psychological Therapies for people with Severe Mental Illness (IAPT-SMI): Evaluating the first operational year of the South London and Maudsley (SLaM) demonstration site for psychosis. *Behaviour Research and Therapy*, 64, 24-30.
- Johns, L. C., & Van Os, J. (2001). The continuity of psychotic experiences in the general population. *Clinical Psychology Review*, 21(8), 1125-1141.
- Joyce., E. M., Hutton., S. B., Mutsatsa., S. H., & Barnes., T. R. E. (2005). Cognitive heterogeneity in first- episode schizophrenia. *British Journal of Psychiatry*, 187, 516-522.
- Jauhar, S., McKenna, P. J., Radua, J., Fung, E., Salvador, R., & Laws, K. R. (2014). Cognitive-behavioural therapy for the symptoms of schizophrenia: systematic review and meta-analysis with examination of potential bias. *The British Journal of Psychiatry*, 204(1), 20-29.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York: Hyperion.
- Kane, J., Honigfeld, G., Singer, J., & Meltzer, H. (1988). Clozapine for the treatment-resistant schizophrenic: a double-blind comparison with chlorpromazine. *Archives of general psychiatry*, 45(9),789-796.
- Karlsen, S., Nazroo, J. Y., McKenzie, K., Bhui, K., & Weich, S. (2005). Racism, psychosis and common mental disorder among ethnic minority groups in England. *Psychological Medicine*, 35(12), 1795-1803.

- Kay, S. R., Flszbein, A., & Opfer, L. A. (1987). The positive and negative syndrome scale (PANSS) for schizophrenia. *Schizophrenia Bulletin*, *13*(2), 261-276.
- Kay, S. R., & Lindenmayer, J. P. (1987). Outcome predictors in acute schizophrenia: Prospective significance of background and clinical dimensions. *The Journal of Nervous and Mental Disease*, *175*(3), 152-160.
- Kay, S. R., Opler, L. A., & Lindenmayer, J. P. (1988). Reliability and validity of the positive and negative syndrome scale for schizophrenics. *Psychiatry Research*, *23*(1), 99-110.
- Keefe, R. S., Bilder, R. M., Harvey, P. D., Davis, S. M., Palmer, B. W., Gold, J. M., & Lieberman, J. A. (2006). Baseline neuro-cognitive deficits in the CATIE schizophrenia trial. *Neuropsychopharmacology*, *31*(9), 2033-2046.
- Kempf, L., Hussain, N., & Potash, J. B. (2005). Mood disorder with psychotic features, schizoaffective disorder, and schizophrenia with mood features: trouble at the borders. *International Review of Psychiatry*, *17*(1), 9-19.
- Keshavan, M. S., Rabinowitz, J., DeSmedt, G., Harvey, P. D., & Schooler, N. (2004). Correlates of insight in first episode psychosis. *Schizophrenia Research*, *70*, 187-194.
- Kessler, R. C., Amminger, G. P., Aguilar-Gaxiola, S., Alonso, J., Lee, S., & Ustun, T. B. (2007). Age of onset of mental disorders: a review of recent literature. *Current Opinion in Psychiatry*, *20*(4), 359-364.
- Kim, H. J., Jhin, H. K., Chung, E. K., Chang, D., & Lee, J. (2007). Cross-cultural validation of the beck cognitive insight scale in Korean. *Psychiatry Investigation*, *4*(2), 109-115.
- Kirkbride, J. B., Fearon, P., Morgan, C., Dazzan, P., Morgan, K., Tarrant, J., *et al.*,...Jones, P.B (2006). Heterogeneity in incidence rates of schizophrenia and other psychotic syndromes: findings from the 3-center AeSOP study. *Archives of General Psychiatry*, *63*(3), 250-258.

- Kirkbride, J. B., Stubbins, C., & Jones, P. B. (2012). Psychosis incidence through the prism of early intervention services. *The British Journal of Psychiatry*, 200(2), 156-157.
- Koren, D., Seidman, L. J., Poyurovsky, M., Goldsmith, M., Viksman, P., Zichel, S., & Klein, E. (2004). The neuropsychological basis of insight in first-episode schizophrenia: a pilot meta-cognitive study. *Schizophrenia Research*, 70(2), 195-202.
- Koren, D., Seidman, L. J., Goldsmith, M., & Harvey, P. D. (2006). Real-world cognitive and meta-cognitive dysfunction in schizophrenia: a new approach for measuring (and remediating) more "right stuff". *Schizophrenia Bulletin*, 32(2), 310-326.
- Køster, A., Lajer, M., Lindhardt, A., & Rosenbaum, B. (2008). Gender differences in first episode psychosis. *Social Psychiatry and Psychiatric Epidemiology*, 43(12), 940-946.
- Kuipers, E., Garety, P., Fowler, D., Dunn, G., Bebbington, P., Freeman, D., & Hadley, C. (1997). London-East Anglia randomised controlled trial of cognitive-behavioural therapy for psychosis: effects of the treatment phase. *The British Journal of Psychiatry*, 171(4), 319-327.
- Kraepelin E (1919) *Dementia Praecox and Paraphrenia*. Edinburgh: Livingston.
- Lake, C. R. (2012). Changing Concepts in the 1990s, 2000s, and 2010s: More Overlap and Similarities. In Lake, C.R. *Schizophrenia Is a Misdiagnosis* (pp. 187-239) Kansas City: Springer.
- Langdon, R., Ward, P. B., & Coltheart, M. (2010). Reasoning anomalies associated with delusions in schizophrenia. *Schizophrenia Bulletin*, 36(2), 321-330.
- Larner, A. J. (2013). *Neuropsychological neurology: the neurocognitive impairments of neurological disorders*. Cambridge University Press.
- Leeson., V. C., Barnes., T. R. E., Harrison., M., Matheson., E., Harrison., I., Mutsatsa., S. H., et al. (2008). The relationship between IQ, memory,

executive function, and processing speed in recent-onset psychosis: 1 year stability and clinical outcome. *Schizophrenia Bulletin*. 36(2), 400-409.

Leeson., V. C., Barnes., T. R. E., Hutton., S. B., Ron., M. A., & Joyce., E. M. (2009). IQ as a predictor of functional outcome in schizophrenia: A longitudinal, four year study of first-episode psychosis. *Schizophrenia Research*, 107, 55-60.

Leeson, V. C., Sharma, P., Harrison, M., Ron, M. A., Barnes, T. R., & Joyce, E. M. (2011). IQ trajectory, cognitive reserve, and clinical outcome following a first episode of psychosis: a 3-year longitudinal study. *Schizophrenia bulletin*, 37 (4), 768-777.

Lepage, M., Buchy, L., Bodnar, M., Bertrand, M.-C., Joover, R., & Malla, A. (2008). Cognitive Insight and verbal memory in first episode of psychosis. *European Psychiatry*, 23(5), 368-374.

Leucht, S., Kane, J. M., Kissling, W., Hamann, J., Etschel, E., & Engel, R. R. (2005). What does the PANSS mean?. *Schizophrenia research*, 79(2), 231-238.

Lieberman, R. P., Kopelowicz, A., Ventura, J., & Gutkind, D. (2002). Operational criteria and factors related to recovery from schizophrenia. *International Review of Psychiatry*, 14(4), 256-272.

Lieberman, R. P., & Kopelowicz, A. (2005). Recovery from schizophrenia: a concept in search of research. *Psychiatric Services*, 56(6), 735-742.

Lieberman JA (1999): Is schizophrenia a neurodegenerative disorder? A clinical and neurobiological perspective *Biological Psychiatry* 46:729–739.

Lieberman, J. A., Drake, R. E., Sederer, L. I., Belger, A., Keefe, R., Perkins, D., *et al.*,. (2008). Science and Recovery in Schizophrenia. *Psychiatric Services*, 59(5), 487-496.

Lieberman, J., Jody, D., Geisler, S., Alvir, J., Loebel, A., Szymanski, S., ... & Borenstein, M. (1993). Time course and biologic correlates of treatment response in first-episode schizophrenia. *Archives of General Psychiatry*, 50(5), 369-376.

- Lieberman JA, Perkins D, Belger A, Chakos M, Jarskog F, Boteva K, Gilmore J (2001). The early stages of schizophrenia: speculations on pathogenesis, pathophysiology, and therapeutic approaches. *Biological Psychiatry* 2001; 50:884–897.
- Lincoln, T. M., Ziegler, M., Mehl, S., & Rief, W. (2010). The jumping to conclusions bias in delusions: specificity and changeability. *Journal of Abnormal Psychology, 119*(1), 40-49.
- Lysaker, P. H., & Dimaggio, G. (2014). Metacognitive capacities for reflection in schizophrenia: implications for developing treatments. *Schizophrenia Bulletin, 40*(3), 487-491.
- Lysaker PH, Hillis J, Leonhardt BL, Kukla M, Buck KD (in press) Metacognition in schizophrenia spectrum disorders: methods of assessment and associations with psychosocial function, neurocognition, symptoms, and cognitive style. In: Lysaker PH, Dimaggio G, Brüne M (Eds). *Metacognition and Social Cognition in Schizophrenia*. New York: Elsevier Press.
- Malla, A., & Payne, J. (2005). First-Episode Psychosis: Psychopathology, Quality of Life, and Functional Outcome. *Schizophrenia Bulletin, 31*(3), 650-671.
- Malla, A. K., Norman, R. M. G., Mancanda, R., & Townsend, L. (2002a). Symptoms, cognition, treatment adherence and functional outcome in first-episode psychosis. *Psychological Medicine, 32*(06), 1109-1119.
- Malla, A. K., Norman, R. M. G., Manchanda, R., Ahmed, M. R., Scholten, D., Harricharan, R.,...Takhar, J. (2002b). One year outcome in first episode psychosis: influence of DUP and other predictors. *Schizophrenia Research, 54*(3), 231-242.
- McGlashan, T. (1988). A selective review of recent North American long-term follow-up studies of schizophrenia *Schizophrenia Bulletin, 14*(4), 515-542.
- McGorry, P. (1995). A treatment-relevant classification of psychotic disorders. *Australasian Psychiatry, 29*(4), 555-558.

- McGorry, P. D., Bell, R. C., Dudgeon, P. L., & Jackson, H. J. (1998). The dimensional structure of first episode psychosis: an exploratory factor analysis. *Psychological Medicine*, 28(04), 935-947.
- McGorry, P. D., Nelson, B., Goldstone, S., & Yung, A. R. (2010). Clinical staging: a heuristic and practical strategy for new research and better health and social outcomes for psychotic and related mood disorders. *Canadian Journal of Psychiatry*, 55(8), 486-497.
- McGorry, P. D., Yung, A. R., Bechdolf, A., & Amminger, P. (2008). Back to the future: predicting and reshaping the course of psychotic disorder. *Archives of General Psychiatry*, 65(1), 25-27.
- McGuffin, P., Farmer, A., & Harvey, I. (1991). A polydiagnostic application of operational criteria in studies of psychotic illness: development and reliability of the OPCRIT system. *Archives of General Psychiatry*, 48, 764-770.
- McKenzie, K., Samele, C., Van Horn, E., Tattan, T., Van Os, J., & Murray, R. (2001). Comparison of the outcome and treatment of psychosis in people of Caribbean origin living in the UK and British Whites Report from the UK700 trial. *The British Journal of Psychiatry*, 178(2), 160-165.
- Menezes, N. M., Arenovich, T., & Zipursky, B. (2006). A systematic review of longitudinal outcome studies of first-episode psychosis. *Psychological Medicine*, 36(10), 1349-1362.
- Menon, M., Mizrahi, R., & Kapur, S. (2008). 'Jumping to conclusions' and delusions in psychosis: relationship and response to treatment. *Schizophrenia Research*, 98(1), 225-231.
- Menon, M., Pomarol Clotet, E., McKenna, P. J., & McCarthy, R. A. (2006). Probabilistic reasoning in schizophrenia: a comparison of the performance of deluded and non-deluded schizophrenic participants and exploration of possible cognitive underpinnings. *Cognitive Neuropsychiatry*, 11(6), 521-536.

- Milev., P., Ho., B.-C., Arndt., S., & Andreasen., N. C. (2005). Predictive values of neurocognition and negative symptoms on functional outcome in schizophrenia: A longitudinal first episode study with 7-year follow-up. *American Journal of Psychiatry*, *162*, 495-506.
- Mintz, A. R., Dobson, K. S., & Romney, D. M. (2003). Insight in schizophrenia: a meta-analysis. *Schizophrenia Research*, *61*(1), 75-88
- Missar, C. D., Gold, J. M., & Goldberg, T. E. (1994). WAIS-R short forms in chronic schizophrenia. *Schizophrenia research*, *12*(3), 247-250.
- Mirsky, A. F. (1969). Neuropsychological Bases of Schizophrenia. *Annual Review of Psychology*, *20*(1), 321-348.
- Morgan, C., Abdul-Al, R., Lappin, J. M., Jones, P., Fearon, P., Leese, M., & Murray, R. (2006). Clinical and social determinants of duration of untreated psychosis in the AESOP first-episode psychosis study. *The British Journal of Psychiatry*, *189*(5), 446-452.
- Morgan, C., Kirkbride, J., Hutchinson, G., Craig, T., Morgan, K., Dazzan, P., ... & Fearon, P. (2008). Cumulative social disadvantage, ethnicity and first-episode psychosis: a case-control study. *Psychological Medicine*, *38*(12), 1701-1715.
- Morgan, C., Mallett, R., Hutchinson, G., Bagalkote, H., Morgan, K., Fearon, P., ... & Leff, J. (2005a). Pathways to care and ethnicity. 2: Source of referral and help-seeking Report from the AESOP study. *The British journal of psychiatry*, *186*(4), 290-296.
- Morgan, C., Mallett, R., Hutchinson, G., Bagalkote, H., Morgan, K., Fearon, P., ... & Leff, J. (2005b). Pathways to care and ethnicity. 1: Sample characteristics and compulsory admission Report from the AESOP study. *The British journal of psychiatry*, *186*(4), 281-289.
- Morrison, A. P., French, P., & Wells, A. (2007). Meta-cognitive beliefs across the continuum of psychosis: Comparisons between participants with psychotic disorders, participants at ultra-high risk and non-participants. *Behaviour Research and Therapy*, *45*(9), 2241-2246.

- Morrison, A. P., Haddock, G., & Tarrier, N. (1995). Intrusive thoughts and auditory hallucinations: a cognitive approach. *Behavioural and Cognitive psychotherapy*, 23(3), 265-280.
- Moritz, S., Krausz, M., Gottwalz, E., Lambert, M., Perro, C., Ganzer, S., & Naber, D. (2000). Cognitive Dysfunction at baseline predicts symptomatic 1-year outcome in first-episode schizophrenics. *Psychopathology*, 33, 48-51.
- Moritz, S., Veckenstedt, R., Hottenrott, B., Woodward, T. S., Randjbar, S., & Lincoln, T. M. (2010a). Different sides of the same coin? Intercorrelations of cognitive biases in schizophrenia. *Cognitive Neuropsychiatry*, 15(4), 406-421.
- Moritz, S., Vitzthum, F., Randjbar, S., Veckenstedt, R., & Woodward, T. S. (2010b). Detecting and defusing cognitive traps: metacognitive intervention in schizophrenia. *Current Opinion in Psychiatry*, 23(6), 561-569
- Moritz, S., & Woodward, T. S. (2005). Jumping to conclusions in delusional and non-delusional schizophrenic participants. *British Journal of Clinical Psychology*, 44(2), 193-207.
- Moritz, S., & Woodward, T. S. (2007). Meta-cognitive training in schizophrenia: from basic research to knowledge translation and intervention. *Current Opinion in Psychiatry*, 20(6), 619-625.
- Moritz, S., Andreou, C., Schneider, B. C., Wittekind, C. E., Menon, M., Balzan, R. P., & Woodward, T.S. (2014). Sowing the seeds of doubt: narrative review on meta-cognitive training in schizophrenia. *Clinical Psychology Review*.
- Mueser, K. T., Corrigan, P. W., Hilton, D. W., Tanzman, B., Schaub, A., Gingerich, S., ... & Herz, M. I. (2002). Illness management and recovery: A review of the research. *Psychiatric Services*, 53(10), 1272-1284.
- Müller, M. J., & Wetzell, H. (1998). Improvement of inter-rater reliability of PANSS items and subscales by a standardized rater training. *Acta Psychiatrica Scandinavica*, 98(2), 135-139.

- Murray, R. M., & Lewis, S. W. (1987). Is schizophrenia a neuro-developmental disorder? *British Medical Journal*, 295 (6600),681-682.
- Myin-Germeys, I., Nicolson, N. A., & Delespaul, P. A. (2001). The context of delusional experiences in the daily life of patients with schizophrenia. *Psychological Medicine*, 31(03), 489-498.
- Nair, A., Palmer, E. C., Aleman, A., & David, A. S. (2014). Relationship between cognition, clinical and Cognitive Insight in psychotic disorders: a review and meta-analysis. *Schizophrenia Research*, 152(1), 191-200.
- National Institute for Health and Care Excellence. (2014). *Psychosis and schizophrenia in adults: Treatment and management*. London: National Institute for Health and Care Excellence. Retrieved from <http://www.nice.org.uk/CG178>.
- Nunnally, J. (1978) *Psychometric theory*. New York: McGraw-Hill Book Company.
- O'Connor, J. A., Wiffen, B., DiForti, M., Ferraro, L., Joseph, C., Kolliakou, A.,...David, A.S. (2013). Neuropsychological, clinical and Cognitive Insight predictors of outcome in a first episode psychosis study. *Schizophrenia Research*, 149(1), 70-76
- O'Connor, J. A., Wiffen, B. D., Reichenberg, A., Aas, M., Falcone, M. A., Russo, M... & David, A. S. (2012). Is deterioration of IQ a feature of first episode psychosis and how can we measure it?. *Schizophrenia Research*,137(1), 104-109.
- Office for National Statistics. (2012). 2011 Census, key statistics for local authorities in England and Wales. Retrieved from: <http://www.ons.gov.uk/ons/publications/re-referencetables>.
- Ormrod, J., Shaftoe, D., Cavanagh, K., Freeston, M., Turkington, D., Price, J., & Dudley, R. (2012). A pilot study exploring the contribution of working memory to “jumping to conclusions” in people with first episode psychosis. *Cognitive neuropsychiatry*, 17(2), 97-114.

- Overall JE, Gorham DR (1962). The Brief Psychiatric Rating Scale. *Psychol Rep* **10**: 790–812.
- Palmer, B. W., Heaton, R. K., Paulsen, J. S., Kuck, J., Braff, D., Harris, M. J., ... & Jeste, D. V. (1997). Is it possible to be schizophrenic yet neuropsychologically normal?. *Neuropsychology*, *11*(3), 437-446.
- Parnas, J., & Handest, P. (2003). Phenomenology of anomalous self-experience in early schizophrenia. *Comprehensive psychiatry*, *44*(2), 121-134.
- Pedersen, G., Hagtvet, K. A., & Karterud, S. (2007). Generalizability studies of the Global Assessment of Functioning–Split version. *Comprehensive Psychiatry*, *48*(1), 88-94.
- Pedrelli, P., McQuaid, J. R., Granholm, E., Patterson, T. L., McClure, F., Beck, A. T., *et al.*,. (2004). Measuring Cognitive Insight in middle-aged and older participants with psychotic disorders. *Schizophrenia Research*, *71*(2-3), 297-305.
- Penttilä, M., Jääskeläinen, E., Hirvonen, N., Isohanni, M., & Miettunen, J. (2014). Duration of untreated psychosis as predictor of long-term outcome in schizophrenia: systematic review and meta-analysis. *The British Journal of Psychiatry*, *205*(2), 88-94.
- Perälä, J., Suvisaari, J., Saarni, S.I., Kuoppasalmi, K., Isometsä, E., Pirkola, S., Partonen, T., Tuulio- Henriksson, A., Hintikka, J., Kiesepä, T., Härkänen, T., Koskinen, S., Lönnqvist, J., 2007. Lifetime prevalence of psychotic and bipolar disorders in a general population. *Archives of General Psychiatry* *64* (1), 19-28.
- Peralta, V., Cuesta, M. J., & Farre, C. (1997). Factor structure of symptoms in functional psychoses. *Biological Psychiatry*, *42*(9), 806-815.
- Perivoliotis, D., Grant, P. M., Peters, E. R., Ison, R., Kuipers, E., & Beck, A. T. (2010). Cognitive Insight predicts favorable outcome in cognitive behavioral therapy for psychosis. *Psychosis: Psychological, Social and Integrative Approaches*, *21*(1), 23-33.

- Peters, E., & Garety, P. (2006). Cognitive functioning in delusions: A longitudinal analysis. *Behaviour Research and Therapy*, 44(4), 481-514.
- Peters, E. R., Joseph, S. A., & Garety, P. A. (1999). Measurement of delusional ideation in the normal population: introducing the PDI (Peters et al Delusions Inventory). *Schizophrenia Bulletin*, 25(3), 553-576.
- Phillips, L. D., & Edwards, W. (1966). Conservatism in a simple probability inference task. *Journal of Experimental Psychology*, 72(3), 346-354.
- Preston, C.C. & Colman, A. (2000) Optimal number of response categories in rating scales: reliability, validity, discriminating power, and respondent preferences. *Acta Psychologica*, 104,1-15
- Rabinowitz, J., De Smedt, G., Harvey, P. D., & Davidson, M. (2002). Relationship Between Premorbid Functioning and Symptom Severity as Assessed at First Episode of Psychosis. *American Journal of Psychiatry*, 159(12), 2021-2026.
- Rabinowitz, J., Levine, S. Z., & Häfner, H. (2006). A population based elaboration of the role of age of onset on the course of schizophrenia. *Schizophrenia Research*, 88(1), 96-101.
- Ram, R., Bromet, E. J., Eaton, W. W., Pato, C., & Schwartz, J. E. (1992). The natural course of schizophrenia. *Schizophrenia Bulletin*, 18(2), 185-207
- Ramsay, J. O. (1973). The effect of number of categories in rating scales on precision of estimation of scale values. *Psychometrika*, 38(4), 513-532.
- Rathod, S., Kingdon, D., Phiri, P., & Gobbi, M. (2010). Developing culturally sensitive cognitive behaviour therapy for psychosis for ethnic minority patients by exploration and incorporation of service users' and health professionals' views and opinions. *Behavioural and Cognitive Psychotherapy*, 38(05), 511-533.
- Reichenberg, A., Harvey, P. D., Bowie, C. R., Mojtabai, R., Rabinowitz, J., Heaton, R. K., et al. (2009). Neuropsychological Function and Dysfunction in

Schizophrenia and Psychotic Affective Disorders. *Schizophrenia Bulletin*, 35(5), 1022-1029.

Reichenberg, A., Caspi, A., Harrington, H., Houts, R., Keefe, R. S. E., Murray, R. M., *et al.*, (2010). Static and Dynamic Cognitive Deficits in Childhood Preceding Adult Schizophrenia: A 30-Year Study. *American Journal Psychiatry*, 167(2), 160-169.

Riecher-Rössler, A., & Rössler, W (1998). The course of schizophrenic psychoses: what do we really know? A selective review from an epidemiological perspective. *European archives of psychiatry and clinical neuroscience*, 248(4), 189-202.

Repper, J., Perkins, R. (2003). *Social Inclusion and Recovery: A model for mental health practice*. London: Balliere Tindall.

Riggs, S. E., Grant, P. M., Perivoliotis, D., & Beck, A. T. (2012). Assessment of Cognitive Insight: a qualitative review. *Schizophrenia Bulletin*, 38(2), 338-350.

Riley., E. M., McGovern., D., Mockler., D., Doku., V. C. K., O'Ceallaigh., S., Fannon., D. G.,...Sharma, T.(2000). Neuropsychological functioning in first-episode psychosis: evidence of specific deficits. *Schizophrenia Research*, 43, 47-55.

Robinson, D., Woerner, M. G., Alvir, J. M. J., Bilder, R., Goldman, R., Geisler, S.,...Lieberman, J.A.(1999). Predictors of Relapse Following Response from a First Episode of Schizophrenia or Schizoaffective Disorder. *Archives of General Psychiatry*, 56(3), 241-247.

Robinson, D., Woerner, M. G., McMeniman, M., Mendelowitz, A., & Bilder, R. M. (2004). Symptomatic and functional recovery from a first episode of schizophrenia or schizoaffective disorder. *American Journal of Psychiatry*, 161(3), 743-479.

Rose, D. (2003). Collaborative research between users and professionals: peaks and pitfalls. *Psychiatric Bulletin*, 27(11), 404-406.

- Rosen, K., & Garety, P. (2005). Predicting recovery from Schizophrenia: a retrospective comparison of characteristics at onset of people with single and multiple episodes. *Schizophrenia Bulletin*, 31(3), 735-750.
- Rubin, D. B. (1976). Inference and missing data. *Biometrika*, 63(3), 581-592.
- Rund, B. R. (1998). A Review of Longitudinal Studies of Cognitive Functions in Schizophrenia participants. *Schizophrenia Bulletin*, 24(3), 425-435.
- Russell, A., Munro, J., Jones, P., Hemsley, D., & Murray, R. (1997). Schizophrenia and the myth of intellectual decline. *American Journal Psychiatry*, 154(5), 635-639.
- Salokangas, R. K. R., & Stengård, E. (1990). Gender and short-term outcome in schizophrenia. *Schizophrenia Research*, 3(5-6), 333-345.
- San, L., Cuidad, A., Alvarez, E., Bobes, J., & Gilaberte, I. (2007). Symptomatic remission and social/vocational functioning in outpatients with schizophrenia: Prevalence and associations in a cross-sectional study. *European Psychiatry*, 22, 490-498.
- Saha, S., Chant, D., Welham, J., & McGrath, J. (2005). A systematic review of the prevalence of schizophrenia. *PLoS medicine*, 2(5), e141.
- Saykin, A., Shtasel, D., Gur, R. E., Kester, D., Mozley, L., Stafiniak, P., *et al.*, (1994). Neuropsychological deficits in neuroleptic naive participants with first episode schizophrenia. *Archives of General Psychiatry*, 51, 124-131.
- Schoenberg, M. R., & Scott, J. G. (2011). *The little black book of neuropsychology: a syndrome-based approach*. New York: Springer.
- Scott, J. G., & Schoenberg, M. R. (2011). Frontal lobe/executive functioning. In Schoenberg & Scott (Eds). *The little black book of neuropsychology* (pp. 219-248). New York: Springer.
- Seidman, L. J. (1983). Schizophrenia and brain dysfunction: an integration of recent neurodiagnostic findings. *Psychological Bulletin*, 94(2), 195-238.

- Seidman, L. J., Kremen, W. S., Koren, D., Faraone, S. V., Goldstein, J. M., & Tsuang, M. T. (2002). A comparative profile analysis of neuropsychological functioning in participants with schizophrenia and bipolar psychoses. *Schizophrenia research*, 53(1), 31-44.
- Simonsen, E., Friis, S., Haahr, U., Johannessen, J., Larsen, T., Melle, I., et al. (2007). Clinical epidemiologic first-episode psychosis: 1-year outcome and predictors. *Acta Psychiatrica Scandinavica*, 115, 54-61.
- Singh, S. P., Croudace, T., Amid, S., Kwieci, R., Medley, I., Jones, P. B., et al.,. (2000). Three-year outcome of first-episode psychoses in an established community psychiatric service. *The British Journal of Psychiatry*, 176(3), 210-216.
- Shafran, R., Clark, D. M., Fairburn, C. G., Arntz, A., Barlow, D. H., Ehlers, A., & Wilson, G. T. (2009). Mind the gap: Improving the dissemination of CBT. *Behaviour research and therapy*, 47(11), 902-909.
- Shallice, T., & Burgess, P. (1991). Higher-order cognitive impairments and frontal lobe lesions in man. *Frontal lobe function and dysfunction*, 125-138.
- Shepherd, M., Watt, D., Faloon, I., & Smeeton, N. (1989). The natural history of schizophrenia: A five year follow-up of outcome and prediction in a representative sample of schizophrenics. *Psychological Medicine* (15), 1-46.
- Slade, M., & Hayward, M. (2007). Recovery, psychosis and psychiatry: research is better than rhetoric. *Acta Psychiatrica Scandinavica*, 116(2), 81-83.
- So, S. H., Freeman, D., Dunn, G., Kapur, S., Kuipers, E., Bebbington, P., et al.,. (2012). Jumping to conclusions, a lack of belief flexibility and delusional conviction in psychosis: a longitudinal investigation of the structure, frequency, and relatedness of reasoning biases. *Journal of Abnormal Psychology*, 121(1), 129-139.
- Sprong, M., Schothorst, P., Vos, E., Hox, J., & Van Engeland, H. (2007). Theory of mind in schizophrenia Meta-analysis. *The British Journal of Psychiatry*, 191(1), 5-13.

- Stefanis, N. C., Hanssen, M., Smirnis, N. K., Avramopoulos, D. A., Evdokimidis, I. K., Stefanis, C. N., ... & Van Os, J. (2002). Evidence that three dimensions of psychosis have a distribution in the general population. *Psychological Medicine*, 32(02), 347-358.
- Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin*, 87(2), 245-251.
- Stilo, S. A., Di Forti, M., Mondelli, V., Falcone, A. M., Russo, M., O'Connor, J., ... & Morgan, C. (2013). Social disadvantage: cause or consequence of impending psychosis?. *Schizophrenia Bulletin*, 39(6), 1288-1295.
- Stirling, J., White, C., Lewis, S., Hopkins, R., Tantam, D., Huddy, A., & Montague, L. (2003). Neurocognitive function and outcome in first-episode schizophrenia: A 10-year follow-up of an epidemiological cohort. *Schizophrenia Research*, 65, 75-86.
- Strauss, E., Sherman, E. M., & Spreen, O. (2006). *A compendium of neuropsychological tests: Administration, norms, and commentary*. Oxford: Oxford University Press.
- Takei, N., Persaud, R., Woodruff, P., Brockington, I., & Murray, R. M. (1998). First episodes of psychosis in Afro-Caribbean and White people. An 18-year follow-up population-based study. *The British Journal of Psychiatry*, 172(2), 147-153.
- The Schizophrenia Commission. (2012). *The abandoned illness: A report from the Schizophrenia Commission*. London: Rethink Mental Illness. Retrieved from: https://www.rethink.org/media/514093/TSC_main_report_14_nov.pdf.
- Thorup, A., Albert, N., Bertelsen, M., Petersen, L., Jeppesen, P., Le Quack, P., ... & Nordentoft, M. (2014). Gender differences in first-episode psychosis at 5-year follow-up—two different courses of disease? Results from the OPUS study at 5-year follow-up. *European Psychiatry*, 29(1), 44-51.
- Tohen, M., Hennen, J., Zarate, C. M., Jr., Baldessarini, R. J., Strakowski, S. M., Stoll, A. L., ... & Cohen, B.M. (2000). Two-year syndromal and functional recovery

- in 219 cases of first-episode major affective Disorder with Psychotic Features. *American Journal of Psychiatry*, 157(2), 220-228.
- Tranulis, C., Lepage, M., & Malla, A. (2008). Insight in first episode psychosis: who is measuring what? *Early Intervention in Psychiatry*, 2, 34-41.
- Uchida, T., Matsumoto, K., Kikuchi, A., Miyakoshi, T., Ito, F., Ueno, T., & Matsuoka, H. (2009). Psychometric properties of the Japanese version of the Beck Cognitive Insight Scale: relation of cognitive insight to clinical insight. *Psychiatry and Clinical Neurosciences*, 63(3), 291-297.
- van Dael, F., Versmissen, D., Janssen, I., Myin-Germeys, I., van Os, J., & Krabbendam, L. (2006). Data gathering: biased in psychosis? *Schizophrenia Bulletin*, 32(2), 341-351.
- van der Gaag, M. (2006). A neuropsychiatric model of biological and psychological processes in the remission of delusions and auditory hallucinations. *Schizophrenia Bulletin*, 32(suppl 1), 113-122.
- van der Gaag, M., Valmaggia, L. R., & Smit, F. (2014). The effects of individually tailored formulation-based cognitive behavioural therapy in auditory hallucinations and delusions: a meta-analysis. *Schizophrenia Research*, 156(1), 30-37.
- van der Meer, L., Costafreda, S., Aleman, A., & David, A. S. (2010). Self-reflection and the brain: a theoretical review and meta-analysis of neuroimaging studies with implications for schizophrenia. *Neuroscience & Biobehavioral Reviews*, 34(6), 935-946.
- van Os, J., Fahy, T., Jones, P., Harvey, I., Sham, P., Lewis, S., *et al.*, (1996). Psychopathological Syndromes in the Functional Psychoses: Associations with Course and Outcome. *Psychological Medicine*, 26(1), 163-178.
- van Os, J., Gilvarry, C., Bale, R., Van Horn, E., Tattan, T., & White, I. (1999). A comparison of the utility of dimensional and categorical representations of psychosis. *Psychological Medicine*, 29(03), 595-606.

- van Os, J., Linscott, R. J., Myin-Germeys, I., Delespaul, P., & Krabbendam, L. (2009). A systematic review and meta-analysis of the psychosis continuum: evidence for a psychosis proneness- persistence-impairment model of psychotic disorder. *Psychological Medicine*, 39(02), 179-195.
- Veling, W., Hoek, H. W., Wiersma, D., & Mackenbach, J. P. (2009). Ethnic identity and the risk of schizophrenia in ethnic minorities: a case-control study. *Schizophrenia Bulletin*, 36(6), 1149-1156.
- Ventura, J., Wood, R. C., & Helleman, G. S. (2011). Symptom Domains and Neurocognitive Functioning Can Help Differentiate Social Cognitive Processes in Schizophrenia: A Meta-Analysis. *Schizophrenia Bulletin*, 39(1), 102-111.
- Verdoux, H., & van Os, J. (2002). Psychotic symptoms in non-clinical populations and the continuum of psychosis. *Schizophrenia research*, 54(1), 59-65.
- Wang, J., & Wang, X. (2012). *Structural equation modelling: Applications using Mplus*. Chichester: John Wiley & Sons.
- Warman, D. M., & Martin, J. M. (2006). Cognitive insight and delusion proneness: An investigation using the Beck Cognitive Insight Scale. *Schizophrenia Research*, 84(2-3), 297-304.
- Warman, D. M., Lysaker, P. H., & Martin, J. M. (2007). Cognitive Insight and psychotic disorder: the impact of active delusions. *Schizophrenia Research*, 90(1), 325-333.
- Wechsler, D. (1997). *WAIS III technical manual*. San Antonio, TX: The Psychological Corporation.
- Weickert, T. W., Goldberg, T. E., Gold, J. M., Bigelow, L. B., Egan, M. F., & Weinberger, D. R. (2000). Cognitive impairments in patients with schizophrenia displaying preserved and compromised intellect. *Archives of General Psychiatry*, 57(9), 907-913.

- Weinberger, D. R. (1987). Implications of normal brain development for the pathogenesis of schizophrenia. *Archives of general psychiatry*, 44(7), 660-669.
- Wiersma, D., Nienhuis, F. J., Slooff, C. J., & Giel, R. (1998). Natural course of schizophrenic disorders: a 15-year follow-up of a Dutch incidence cohort. *Schizophrenia Bulletin*, 24(1), 75-85.
- Wiersma, D., Wanderling, J., Dragomirecka, E., Ganey, K., Harrison, G., An Der Heiden, W.,...& Walsh, D. (2000). Social disability in schizophrenia: its development and prediction over five years in incidence cohorts in six European centres. *Psychological Medicine*, 30(5), 1155-1167.
- Wiffen, B. (2011). *Investigating the Cognitive Basis of Insight in First Episode Psychosis*. (Doctoral dissertation) Kings College London: UK.
- Williamson P (2006). *Mind, Brain, and Schizophrenia*. New York: Oxford University Press
- Willhite, R. K., Niendam, T. A., Bearden, C. E., Zinberg, J., O'Brien, M. P., & Cannon, T. D. (2008). Gender differences in symptoms, functioning and social support in patients at ultra-high risk for developing a psychotic disorder. *Schizophrenia Research*, 104(1), 237-245.
- Wing, J. K., Curtis, R. H., & Beever, A. S. (1996). *HoNOS: Health of the nation outcome scales*. (Report on Research and Development) London: Royal College of Psychiatrists. Retrieved from <http://hdl.handle.net/10068/409066>
- Woodall, A., Howard, L., & Morgan, C. (2011). Barriers to participation in mental health research: findings from the Genetics and Psychosis (GAP) Study. *International Review of Psychiatry*, 23(1), 31-40.
- Woodward, T. S., Munz, M., LeClerc, C., & Lecomte, T. (2009). Change in delusions is associated with change in “jumping to conclusions”. *Psychiatry Research*, 170(2), 124-127.

- World Health Organisation, (1992). *The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines*. Geneva: WHO.
- World Health Organization. (1994). *Schedules for Clinical Assessment In Neuropsychiatry Version 2*. Geneva:WHO.
- Yamazawa, R., Nemoto, T., Kobayashi, H., Chino, B., Kashima, H., & Mizuno, M. (2008). Association between duration of untreated psychosis, pre-morbid functioning, and cognitive performance and the outcome of first-episode schizophrenia in Japanese participants: prospective study. *Australian and New Zealand Journal of Psychiatry*, 42(2), 159-165.
- Youth Justice working group (2012) *Rules of Engagement: Changing the heart of youth justice*. Retrieved from <http://www.macuk.org/wped/wp>
- Zanelli, J., Reichenberg, A., Morgan, K., Fearon, P., Kravariti, E., Dazzan, P., *et al.*,. (2010). Specific and Generalized Neuropsychological Deficits: A Comparison of participants With Various First-Episode Psychosis Presentations. *American Journal of Psychiatry*, 167(1), 78-85.
- Zipursky, R. B., Reilly, T. J., & Murray, R. M (2012). The myth of schizophrenia as a progressive brain disease. *Schizophrenia Bulletin*, 39(6), 1363-1372.

APPENDICES

Appendix A

**Institute of
Psychiatry**

at The Maudsley

Ethical Committee
(Research)
Research Ethics Co-ordinator
Margaret M Chambers Msc

P006, Room W109
De Crespigny Park
Denmark Hill
London SE5 8AF
Tel 020 7848 0797
Fax 020 7848 0147
Email m.chambers@iop.kcl.ac.uk

KING'S
College
LONDON

University of London

ETHICAL COMMITTEE (RESEARCH)

14 September 2005

Prof R Murray
Division of Psychological medicine
PO63
Institute of Psychiatry

Dear Prof Murray

Re: Biological Phenotypes, environment and genes in psychosis (135/05 or 05/Q0706/158)

The Chair of the Ethical Committee (Research) has taken action to approve this study from an ethical point of view.

Please note that this approval is subject to confirmation by the full Committee when it meets on 21 October 2005. Initial approval is given for one year. This will be extended automatically only on completion of annual progress reports on the study when requested by the EC(R). Please note that as Principal Investigator you are responsible for ensuring these reports are sent to us.

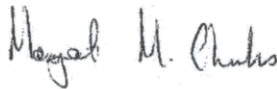
Please note that projects which have not commenced within two years of original approval must be re-submitted to the EC(R).

Any serious adverse events which occur in connection with this study should be reported to the Committee using the attached form.

Please quote Study No. 135/05 in all future correspondence with the IOP/SLAM Research Ethics Office.

When corresponding with other LRECs, please quote Study No. 05/Q0706/158, which is the study number as registered on the national Research Ethics Database.

Yours sincerely,



Margaret M Chambers
Research Ethics Coordinator





Health Research Authority

NRES Committee London - Camberwell St Giles

(Formerly known as The Joint South London and Maudsley and Institute of Psychiatry Research Ethics Committee)

Administrative address:
Victoria House Capital
Park Fulbourn Cambridge
CB21 5XB

Tel: 01223 597656
Fax: 01223 597645

31 July 2012

Professor Robin M Murray

robin.murray@kcl.ac.uk

Professor of
Psychiatric Research
Department of
Psychosis Studies PO
Box 63 Institute of
Psychiatry De
Crespigny Park
Denmark Hill
London
SE5 8AF

Dear Professor Murray

Study title:	Genetics and Psychosis (GAP)
REC reference:	05/Q0706/158
Amendment number:	Amendment Number 12; December 2011
Amendment date:	19 June 2012

Thank you for submitting the above amendment, which was received on 20 July 2012. It is noted that this is a modification of an amendment previously rejected by the Committee (our letter of 17 April 2012 refers).

The modified amendment was reviewed at the meeting of the Sub-Committee held on 01 August 2012 by prior email correspondence. A list of the members who took part in the review is attached.

Ethical opinion

I am pleased to confirm that the Committee has given a favourable ethical opinion of the modified amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved are:

05/Q0706/158:

Please quote this number on all correspondence

Document	Version	Date
Section 2 - Information and Consent Form (not for data entry)	7	21 December 2011
Modified Amendment	Amendment Number 12;	19 June 2012

	December 2011	
Covering Letter	From Sir Murray	16 June 2012
Qualitative Interviews in the GAP study - Topic Guide	May 2012	
Appendix 1	January 2012	

R&D approval

All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

Statement of compliance

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.

Yours sincerely



Mr John Richardson
Chair

E-mail: april.saunders@eoe.nhs.uk

Enclosures: List of names and professions of members who took part in the review

Copy to:
London

Jenny Liebscher, Institute of Psychiatry, King's College

jennifer.liebscher@kcl.ac.uk

NRES Committee London - Camberwell St Giles

Attendance at Sub-Committee of the REC meeting on 01 August 2012

<i>Name</i>	<i>Profession</i>	<i>Capacity</i>
Ms Sally Gordon Boyd	Retired Medical Ethicist	Lay
Professor Veena Kumari	Professor of Experimental Psychology	Expert
Mr John Richardson	Retired Director of COREC; Ecumenical Officer for Churches Together in South London	Lay
Mr Evan Stone QC	Retired Queen's Counsel	Lay

Also in attendance:

<i>Name</i>	<i>Position (or reason for attending)</i>
Miss April Saunders	Acting REC Coordinator

Appendix B

From: Psychology-Webmaster@rhul.ac.uk <Psychology-Webmaster@rhul.ac.uk>

Sent: 09 April 2014 14:50

To: nxjt016@rhul.ac.uk; Ellett, Lyn

Cc: PSY-EthicsAdmin@rhul.ac.uk; Leman, Patrick; Lock, Annette; umjt001@rhul.ac.uk

Subject: Ref: 2014/034 Ethics Form Approved

Application

View the form click [here](#) Revise the form click [here](#)

Details:

Applicant

Jennifer O'Connor

Name:

Application

Does Cognitive Insight predict recovery in psychosis?

title:

Appendix C

Global Assessment of Functioning (GAF) Scale – SYMPTOMS

Consider psychological functioning on a hypothetical continuum of mental health-illness. **Rate symptoms over the last week before interview.**

100-91	No symptoms.
90-81	Absent or minimal symptoms (e.g. mild anxiety before an exam).
80-71	If symptoms are present they are transient and expectable reactions to psychosocial stresses (e.g. difficulty concentrating after family argument).
70-61	Some mild symptoms (e.g. depressed mood and mild insomnia).
60-51	Moderate symptoms (e.g. flat affect and circumstantial speech, occasional panic attacks).
50-41	Serious symptoms (e.g. suicide ideation, severe obsessional rituals, frequent shoplifting).
40-31	Some impairment in reality testing or communication (e.g. speech is at times illogical, obscure or irrelevant).
30-21	Behaviour is considered influenced by delusions or hallucinations OR serious impairment in communications or judgement (e.g. sometimes incoherent, acts grossly inappropriately, suicidal preoccupation).
20-11	Some danger or hurting self or others (e.g. suicide attempts without clear expectation of death, frequently violent, manic excitement) OR gross impairment in communication (e.g. largely incoherent or mute).
10-1	Persistent danger of severely hurting self or others (e.g. recurrent violence) serious suicidal act with clear expectation of death.

Global Assessment of Functioning (GAF) Scale - DISABILITY

Consider psychological, social and occupational functioning on a hypothetical continuum of mental health-illness. Do not include impairment of function due to physical or environmental limitations. **Rate functioning over the last week before interview.**

100-91	Superior functioning in a wide range of activities; life's problems never get out of hand; is sought out by others because of his/her positive qualities.
90-81	Good functioning in all areas, interested and involved in a wide range or activities, socially effective, generally satisfied with life, no more than everyday problems or concerns (e.g. an occasional argument with family members).
80-71	No more than slight impairment in social, occupational, or school functioning (e.g. temporarily falling behind in school work).
70-61	Some difficulty in social, occupational, or school functioning (e.g. occasional truancy, or theft within the household), but generally functioning pretty well, has some meaningful interpersonal relationships.
60-51	Moderate difficulty in social, occupational, or school functioning (e.g. few friends, conflicts with co-workers).
50-41	Any serious impairment in social, occupational, or school functioning (e.g. no friends, unable to keep a job).
40-31	Major impairment in several areas, such as work or school, family relations, judgement, thinking, or mood (e.g. depressed man avoids friends, neglects family, and is unable to work; child frequently beats up younger children, is defiant at home, and is failing at school).
30-21	Inability to function in almost all areas (e.g. stays in bed all day; no job, home or friends).
20-11	Occasionally fails to maintain minimal personal hygiene (e.g. smears faeces) OR gross impairment in communication (e.g. largely incoherent or mute).
10-1	Persistent inability to maintain minimum personal hygiene.

Appendix D

PANSS

Instructions: Tick the term for each symptom which best describes the patient's condition **over the last 7 days and not relative to any other time**. For more detailed information on each PANSS item, and to make ratings, you should use the **PANSS Manual of Definitions**

<u>Positive Scale</u>	SCORE						
ITEM	Absent	Minimal	Mild	Moderate	Moderate Severe	Severe	Extreme
P1: Delusions	1	2	3	4	5	6	7
P2: Conceptual disorganization	1	2	3	4	5	6	7
P3: Hallucinatory behaviour	1	2	3	4	5	6	7
P4: Excitement	1	2	3	4	5	6	7
P5: Grandiosity	1	2	3	4	5	6	7
P6: Suspiciousness / persecution	1	2	3	4	5	6	7
P7: Hostility	1	2	3	4	5	6	7

<u>Negative Scale</u>	SCORE						
ITEM	Absent	Minimal	Mild	Moderate	Moderate Severe	Severe	Extreme
N1: Blunted affect	1	2	3	4	5	6	7
N2: Emotional withdrawal	1	2	3	4	5	6	7
N3: Poor rapport	1	2	3	4	5	6	7
N4: Passive/apathetic social withdrawal	1	2	3	4	5	6	7
N5: Difficulty in abstract thinking	1	2	3	4	5	6	7
N6: Lack of spontaneity and Flow of conversation	1	2	3	4	5	6	7
N7: Stereotyped thinking	1	2	3	4	5	6	7

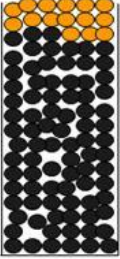
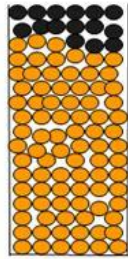
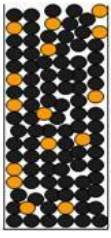
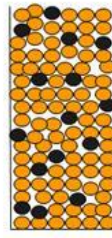



<u>General Psychopathology Scale</u>	SCORE						
ITEM	Absent	Minimal	Mild	Moderate	Moderate Severe	Severe	Extreme
G1: Somatic concern	1	2	3	4	5	6	7
G2: Anxiety	1	2	3	4	5	6	7
G3: Guilt Feelings	1	2	3	4	5	6	7
G4: Tension	1	2	3	4	5	6	7
G5: Mannerisms and Posturing	1	2	3	4	5	6	7
G6: Depression	1	2	3	4	5	6	7
G7: Motor Retardation	1	2	3	4	5	6	7
G8: Uncooperativeness	1	2	3	4	5	6	7
G9: Unusual thought content	1	2	3	4	5	6	7
G10: Disorientation	1	2	3	4	5	6	7
G11: Poor attention	1	2	3	4	5	6	7
G12: Lack of judgment and insight	1	2	3	4	5	6	7
G13: Disturbance of volition	1	2	3	4	5	6	7
G14: Poor impulse control	1	2	3	4	5	6	7
G15: Preoccupation	1	2	3	4	5	6	7
G16: Active social avoidance	1	2	3	4	5	6	7

















Appendix E

Beck Cognitive Insight Scale: Below is a list of sentences about how people think and feel. Please read each sentence in the list carefully. Indicate how much you agree with each statement by placing an X in the corresponding space in the column next to each statement.

	<i>Do not agree at all</i>		<i>Agree slightly</i>		<i>Agree a lot</i>		<i>Agree completely</i>	
	1	2	3	4	5	6	7	
At times, I have misunderstood other people's attitudes towards me.								
My interpretations of my experiences are definitely right								
Other people can understand the cause of my unusual experiences better than I can.								
I have jumped to conclusions too fast								
Some of my experiences that have seemed very real may have been due to my imagination.								
Some of the ideas I was certain were true turned out to be false.								
If something feels right, it means that it is right.								
Even though I feel strongly that I am right, I could be wrong.								
I know better than anyone else what my problems are								
When people disagree with me, they are generally wrong.								
I cannot trust other people's opinion about my experiences.								
If somebody points out that my beliefs are wrong, I am willing to consider it								
I can trust my own judgment at all times.								
There is often more than one possible explanation for why people act the way they do.								
My unusual experiences may be due to my being extremely upset or stressed.								

Appendix F

<p>Richard Dawkins The Weasel Copyright © 1986 by W. H. Freeman & Co. Modified by Philippe Druy and David Forster</p> <h2 style="text-align: center;">The GAP Study Beads task</h2> <p style="text-align: right; font-size: small;">SS 12 mini down all domains memory, skills</p>	<p>There are two jars: A mainly orange jar containing 85 orange and 15 black beads and a mainly black jar containing 85 black and 15 orange beads</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Mainly Black Jar (85 black; 15 orange)</p> </div> <div style="text-align: center;">  <p>Mainly Orange Jar (85 orange; 15 black)</p> </div> </div>
<p>The beads have been mixed up in the jar</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Mainly Black Jar (85 black; 15 orange)</p> </div> <div style="text-align: center;">  <p>Mainly Orange Jar (85 orange; 15 black)</p> </div> </div>	<h3>INSTRUCTIONS</h3> <p>One of the jars has been chosen at random. Beads will be drawn from the selected jar and shown. The beads will always come from the same jar and will be replaced afterwards so that the proportions stay the same.</p> <p>It is your job to decide from which jar the beads have come. You may see as many beads as you like before making a decision. After a bead has been shown to you, you can ask for another bead or you can tell me that you know which jar has been chosen, and you can tell me whether it is the Mainly Orange Jar or the Mainly Black Jar.</p> <p>Remember you can see as many beads as you like before you decide from which jar the beads are from. Only decide when you are certain.</p> <p>You will now see the first bead.</p>
<p>The bead drawn is:</p> <div style="text-align: center; margin: 20px 0;">  </div> <p style="text-align: center; font-size: small;">Would you like to see anymore beads or have you decided now?</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> BEADS PREVIOUSLY SEEN </div>	<p>The bead drawn is:</p> <div style="text-align: center; margin: 20px 0;">  </div> <p style="text-align: center; font-size: small;">Would you like to see anymore beads or have you decided now?</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> BEADS PREVIOUSLY SEEN <div style="display: flex; align-items: center; margin-top: 5px;">  </div> </div>

<p>The bead drawn is:</p>  <p>Would you like to see anymore beads or have you decided now?</p> <p>BEADS PREVIOUSLY SEEN</p> 	<p>The bead drawn is:</p>  <p>Would you like to see anymore beads or have you decided now?</p> <p>BEADS PREVIOUSLY SEEN</p> 
<p>The bead drawn is:</p>  <p>Would you like to see anymore beads or have you decided now?</p> <p>BEADS PREVIOUSLY SEEN</p> 	<p>The bead drawn is:</p>  <p>Would you like to see anymore beads or have you decided now?</p> <p>BEADS PREVIOUSLY SEEN</p> 
<p>The bead drawn is:</p>  <p>Would you like to see anymore beads or have you decided now?</p> <p>BEADS PREVIOUSLY SEEN</p> 	<p>The bead drawn is:</p>  <p>Would you like to see anymore beads or have you decided now?</p> <p>BEADS PREVIOUSLY SEEN</p> 
<p>The bead drawn is:</p>  <p>Would you like to see anymore beads or have you decided now?</p> <p>BEADS PREVIOUSLY SEEN</p> 	<p>The bead drawn is:</p>  <p>Would you like to see anymore beads or have you decided now?</p> <p>BEADS PREVIOUSLY SEEN</p> 

Appendix G

Information and Consent Form (not for data entry)

You have been asked to take part in a study being conducted in the South London and Maudsley NHS Trust. Before you decide whether to enter the study, it is important that you understand why the research is being done and what it will involve. Please take time to read the following information and ask any questions if something is not clear or you wish to know more.

TITLE OF PROJECT: GENETICS AND PSYCHIATRIC ILLNESS (GAP)

What are the aims of the study?

In our research project we are interested in identifying what the main risk factors that predispose to psychosis are. In particular, we want to know whether there are any genes that increase the risk of developing a psychotic disorder, either alone or by interacting with environmental factors such as stress, cannabis, and infections. Part of the reason why some people become ill may lay in genetic differences between people, in the same way that we are different in the colour of our eyes, hair etc. To achieve this, we will compare the genetic make-up of people with a diagnosis of psychosis with the make-up of people with similar characteristics but no history of mental health problems.

We also aim to establish whether some genes might influence the course of the illness and response to medication. Some patients experience an improvement of their psychiatric symptoms when they are treated with medications, whereas others do not do so well and/or experience severe side-effects. Therefore we aim to look at how genes can influence individual differences in response to drug treatment so that we may be able to choose better drugs for each person. The type of genetic analysis that we carry out is only for research purposes and does not at present produce clinically relevant results.

Finally, an additional aim of the study is to understand how the social environment may contribute to the onset of illness and the illness experience.

Why are we asking for your help?

You have been invited to take part in this study because of the nature of the symptoms that you appear to have been experiencing. During the course of the study approximately 1000 people who have had symptoms like yours will be asked to take part.

Note that a patient does not have to be involved in the GAP project research and, if they decide not to take part, it will not affect their current or future medical care in any way.

What will we ask of you if you take part in the study?

For this project we will ask from you a small sample of blood, about 20 mL (a few tablespoons full) or cheek swab and saliva samples for metabolic and genetic analysis. We may also use your blood and saliva sample to:

- 1) Measure the level of hormones and proteins contained in the blood serum and in the saliva.
- 2) Look at the expression of some genes of interest in the white cells contained in the blood.

A medically trained researcher will take the blood sample using disposable sterile equipment. It will only take few minutes as for any routine blood sample. If you are unable or unwilling to give a blood sample it is also possible to perform genetic analysis from cheek swab samples,

a simple procedure that (we can show you the kit and illustrate the procedure) collects dead cells present in your saliva and in your mouth. From the cheek swab sample we cannot measure level of medication or look at expression of genes, we can only extract a small amount of DNA. Therefore we prefer to ask for a blood sample to guarantee a better quality of our results and make the most out of your generous help. A researcher will demonstrate how to collect the saliva sample and will provide you with the tubes required. The level of some proteins contained in the saliva can give us an indication of differences in the level of stress experienced by healthy volunteers and people suffering from mental illnesses.

We will also ask for some of your time to collect clinical and socio-demographic information using standardised research instruments: diagnostic interview, symptoms rating scale, socio-demographic interview and neuropsychological tests. We may also ask you to participate in an interview asking about your own perspectives on your social environment and your health condition.

If you have already taken part in other research projects at the Institute of Psychiatry, London that involved some of the assessment we are interested in, we will not ask you to undergo them again but we request your permission to use the existing data.

Some people within the study will be invited to undergo an MRI scan of the head and of another region of the body (the adrenal gland, a small gland above the kidney). They will be presented with separate information and consent forms for this procedure.

The sample collection and the clinical assessment will require approximately 3 hours of your time. Moreover we would like to contact you again for follow up (up to 24 months) to repeat the above assessments to investigate changes over time. We will also reimburse any travel expense related to your participation into the study.

We will also ask for your consent to contact your GP, mother (or father) and a sibling. This is 1) to collect information from your GP records and mother about events that may have occurred very early in your life, such as complications during pregnancy and neonatal infections, 2) to conduct some of the same assessments with your sibling that we have conducted with you, and 3) to ask your sibling similar questions that we have asked you about the environment in which you both grew up and experiences you may have had in childhood. We will only contact your GP and/or relative(s) with your explicit consent and we will not disclose any information we have collected from you to them. If you agree for us to contact your mother (or father) and/or a sibling, we will only proceed to interview them if they provide consent.

What are the risks?

The risks involved are those of ordinary blood tests such as small pain and occasionally a small bruise around the area from where the sample has been taken. There is no risk involved in the collection of saliva.

Is Confidentiality guaranteed?

All personal information about you is regarded as strictly confidential; only researchers belonging to the study team, and not external collaborators, know which sample belongs to whom. All the information about you will be coded; you will not be identifiable in any research outcome.

- 1) The blood samples first and the DNA samples after extraction will be stored in the Institute of Psychiatry secured laboratory until reporting is complete.
- 2) The samples will be coded using bar codes (numbers and letters not referring to your name or date of birth) that will be entered on a secure computerized data base.
- 3) The clinical information collected on the sample will be securely held in the Institute of Psychiatry building.
- 4) Nothing that you have told us will be mentioned to any relative you might give us permission to contact.

The access to the samples and the related information will be restricted to the researchers involved in the study. In case of commercial collaborations only the coded data will be shared, therefore no researcher external to the study team will ever have access to personal data

concerning participants.

Any future work will pursue aims related to the topic of this project and any extension of the project beyond 5 years, will be subject to review by a research ethics committee. You are free to withdraw from this study at any point without giving a reason by contacting the researcher whose details are at bottom of the consent form. Withdrawal will not affect any of the care and treatment you receive.

What are the benefits for you of taking part?

This is a research project, looking at comparing a group of healthy volunteers with people experiencing their first psychotic episode. As mentioned before, this study will not produce individual test results for any of the data collected. Therefore we cannot offer direct benefits for you. We will be able to provide all participants with a general summary of our research, when the project is complete, through a project newsletter. Our research study is also described on the Institute of Psychiatry general website (www.iop.kcl.ac.uk), under the Department of Psychosis Studies section.

Who is funding this project?

This study is funded by the The Maudsley Charitable Fund, the Department of Health, **the Wellcome Trust and the European Union**. Thank you very much for your time and once again please ask for more information on both the project and/or your illness/symptoms if it is still unclear.

Contact details for research team:

Dr Marta Di Forti
Institute of Psychiatry
Tel 020 7848 5352 e-
mail: marta.diforti@kcl.ac.uk

CONSENT FORM

If you have come to the decision to enter the study after carefully considering the information provided, please read and sign this form.

TITLE OF PROJECT: GENETICS AND PSYCHIATRIC ILLNESS (GAP)

Researcher: Dr Marta Di Forti, Institute of Psychiatry

- | | | |
|--|-----|----|
| 1) I have read the information sheet and I have been given a copy. I was given the opportunity to ask questions. I understand why the research is being done and the risks involved. | Yes | No |
| 2) I agree to give a sample of blood/cheek swab and saliva samples for research in the above project. I understand how the sample will be collected, that giving the sample is voluntary and that I am free to withdraw at any time without giving a reason, and without my medical treatment or legal rights being affected. I understand that I will be contacted in the future to repeat part of the assessment. | Yes | No |
| 3) I understand that research using the sample I give will involve genetic analysis aimed at understanding the role of genes in disease and response to drugs, that the data produced are for research rather than clinical purposes, and that these results will have no implications for me personally. | Yes | No |
| 4) I understand I will not receive any 'test' results from this study , because the assessment I will undergo, does not produce clinically relevant information but just research data. The project newsletter will describe the general importance of any research results obtained. | Yes | No |
| 5) I give permission for my previous research records to be looked at, and information from them to be analysed in strict confidence by responsible professional staff from the research team. Researchers external to the study team, collaborating in the project (including commercial collaborations) will only access my coded data. | Yes | No |
| 6) I agree that the samples I have given and the information gathered about me can be examined and stored until reporting is complete at the Institute of Psychiatry. I understand that future authorised research may be performed by researchers other than those who conducted the first project, including researchers from commercial organisations. To guarantee confidentiality, I agree that researchers external to the study team, including those from commercial collaborators, will only have access to coded data and not to personal details. Any future research will only pursue aims related to the topic of this project, and any extension of the project will be subjected to review by a research ethics committee. | Yes | No |
| 7) I consent to the input of coded data obtained from my blood sample and from the information gathered about me into a computer, to be used for statistical analysis and research. I understand I have the right to request, via the study co-ordinator, to review data concerning me, and to have such data modified if inaccurate, or deleted. | Yes | No |
| 8) I consent to participate in a digitally-recorded interview about my own | Yes | No |

perspectives on my health condition and on my social experiences. I

understand that this interview would be recorded to ensure that my own views are adequately represented.

9) I understand I will not benefit financially if this research leads to the development of a new treatment of medical test but my travel expenses will be reimbursed. **Yes No**

10) I give permission for my GP records to be looked at. **Yes No**

11) I agree to my mother being approached to participate in this study. **Yes No**

Contact details:

Name

Address

.....

Phone Number

12) I agree to a sibling being approached to participate in this study. **Yes No**

Contact details:

Name

Address

.....

Phone Number

.....
Name of Subject **Date** **Signature**

.....
Name of Researcher **Date** **Signature**

Would you like to be sent further information about the project in our newsletter? **Yes No**

Contact details for research team:

Dr Marta Di Forti
Institute of Psychiatry
Tel 020 7848 5352
e-mail:
marta.diforti@kcl.ac.uk