Volume 1: Research Component

The centrality of psychotic experiences and emotional dysfunction following psychosis

Submitted by

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Overview

This thesis was submitted as part of the Doctorate in Clinical Psychology at the School of Psychology, University of Birmingham. It comprises of two volumes. The first volume is the research component and includes an empirical study and a review of the literature. The second volume is the clinical component and includes five clinical practice reports.

Volume I: Research Component

The literature review examines the concept of emotion regulation as it applies to people with psychosis. Emotion regulation is the automatic or controlled, conscious or unconscious process of up-regulating or down-regulating emotions on either a behavioural, physiological or experiential level. This concept is receiving increased attention in clinical research because it has been implicated as a transdiagnostic factor in psychopathology. However it is only beginning to be examined within psychosis research. For this reason a review of the literature is timely. The review highlights that across both emotion regulation and coping literature (an implicit form of emotion regulation) in psychosis there is evidence that certain strategies of regulation are associated with poorer symptomatic and functional outcomes. The review suggests that based on the evidence a causal inference can be made, in that maladaptive emotion regulation strategies can increase or decrease psychotic symptomatology and inhibit or facilitate functioning. Methodological and theoretical challenges within the field of research are highlighted and suggestions regarding current directions for study are proposed.

The empirical paper presents a quantitative study which examines the newly developed concept of centrality in a population with first-episode psychosis. The centrality of an event, defined by the event marks a turning point in life, affects personal identity and is a source for everyday inferences, is associated with increased risk of developing post-traumatic reactions and emotional dysfunction following stressful events. There is a well-developed body of evidence highlighting that psychosis has a global impact on a person's life which can also be traumatising and followed by symptoms of depression and anxiety. We examined the psychosis was reported as a central life event and whether centrality was associated with symptoms of trauma, anxiety and depression. The results showed that psychosis was reported to be a highly central event but centrality was only weakly

associated with symptoms of post-psychotic trauma. Centrality was more strongly associated with symptoms of post-psychotic depression. There was no association found between psychosis and anxiety. However post-psychotic cognitions were associated with post-psychotic depression, anxiety and trauma. The conclusion reached was that the centrality of psychosis was shown to be associated with post-psychotic depression but this relationship was secondary to that of post-psychotic appraisals

The paper is prepared for the submission to the journal Clinical Psychological Science.

Volume II: Clinical Component

The second volume of the thesis presents five clinical practice reports. Firstly, a case formulation from a cognitive behavioural and a systemic perspective is presented for a 15 year-old boy with school refusal and social anxiety who had been referred to a child and adolescent mental health service (CAMHS). Secondly, a service evaluation was carried out to assess how well a CAMHS service met guidelines set out by the National Institute for Clinical Excellence (NICE) when intervening with young people and adolescents with mental health problems. Next, using a transdiagnostic cognitive-behavioural therapeutic (CBT) approach, a case study is presented of an intervention for a 15 year old boy with a learning disability and his mother who were experiencing increasingly aggressive confrontation in the home. Fourthly, a single-case experimental design was used to evaluate the effectiveness of a transdiagnostic CBT approach to persecutory anxiety with 31-year old women using an Early Intervention Service. Finally, an abstract is presented summarising an intervention for staff by using a consultancy model within an older-adult inpatient setting.

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Lastly, my love to Grainne for all her kindness, emotional support and intelligence.

Dedications

To those we as a family have lost this year. Rest in Peace.

Volume I Contents

Contents

Figures and Tables

Emotion regulation in psychosis: A review of the literature.

Word count: 10,686

Abstract

Objective: The objective of this paper was to critically review the literature examining emotion regulation (ER) in psychosis populations across two different paradigms, explicit measures of ER and implicit measures of ER contained within the literature on coping and stress in psychosis patients.

Method: Five databases (PsycINFO, Embase, Medline, PubMed, and Web of Knowledge) were searched for relevant articles. Included papers had to satisfy the following inclusion criteria: 1) written in English; 2) empirical studies only; 3) published in peer reviewed journals; 4) used adult populations (18+ years); 5) included a psychosis population and 6) included a specific measure of ER. Reference lists were also scanned for relevant articles.

Results: Twenty-one papers met inclusion criteria. Specific information was extracted from each paper including sample demographics, the nature of the psychosis, ER assessment methods, and additional measures of psychopathology and individual characteristics, study hypotheses, study findings and additional findings. The relationship between ER and demographic, clinical, developmental and personality factors was also reviewed.

Discussion: This review critically evaluated the available research to date on the nature of ER in a range of populations with psychosis. Characteristically different ER strategies appear evident in clinical populations, as does coping styles which are related to ER differences. The evidence was also clear that subgroups within psychosis populations exist and that the subgroups have different emotional profiles. Significant gaps in the literature currently exist and methodological problems with the study of ER across clinical populations are highlighted.

1. Introduction

Emotion regulation (ER) is a concept receiving an increasing amount of research attention (Gross & Thompson, 2007). This is because it is increasingly becoming thought of as an important factor in the development and maintenance of psychopathology (Aldao & Nolen-Hoeksema, 2010; Kring & Sloan, 2010) and it is being incorporated into models of mental disorders (Berenbaum, Raghavan, Le, Vernon, & Gomez, 2003). There are also an increasing number of interventions being designed that specifically address difficulties in regulating emotion (Barlow, Allen, & Choate, 2004; Greenberg, 2002; Mennin & Fresco, 2010). The current review considers the potential role of ER in psychosis which compared to other clinical samples has not received as much attention. However, before the review it is first necessary to consider the concepts of both emotions and emotional regulation.

1.1 Emotion

Emotions such as anger fear and happiness have evolved as functional processes that help us operate within our environment (Cosmides & Tooby, 2000; Gross & Thompson, 2007; Lazarus, 1991; Power & Dalgleish, 2008). Emotions are integral to effective decision-making (Damasio 1995, 2000; Kahneman, 2011), problem-solving (Parrott & Schulkin, 1993) and social functioning (Gross, 2002) because emotions provide dynamic feedback about the environment and context (Bonanno & Mancini, 2012). Hence they are directly linked to a sense of wellbeing (Mayer, Salovey, & Caruso, 2004) and mental health (Kring & Werner, 2004). Emotions are differentiated from mood and affect in that they tend to be quick to form and do not last longer than a few seconds (Ekman, 1992b) and are typically a response to a particular object (Davidson et al., 1994). Moods in comparison can last a few days and may not be associated with any one thing in particular (Ekman, 1992a) while affect is understood to be the superordinate descriptor of arousal that has a valence (Averill et al., 1994). Emotions also have multiple domains. They can be expressed behaviourally, felt internally or can produce physiological changes within the body that can be below the level of consciousness (Ekman, 1992a, 1992b; Lang, 1995; Levenson, 1994). These three domains have been examined by looking at the behavioural expression of emotion (Kring & Caponigro, 2010; Kring & Neale, 1996), physiological markers (Myin-Germeys & van Os, 2007), and self-report data on the subjective experiences of emotions (Kring & Caponigro, 2010; van 't Wout, Aleman, Bermond, & Kahn, 2007).

1.2 Emotion regulation and how it develops

Although there has been some debate around the issue, ER is a separate process from the generation of emotions (Bloch, Moran, & Kring; Kring & Werner). It can be defined in the following way;

> "Emotional regulation refers to the automatic or controlled, conscious or unconscious process of individuals influencing emotion in self, others, or both." (Boch, Kring & Werner, 2010; p. 91)

This definition describes a process that:

> "…involves changes in emotion dynamics, or the latency, rise time, magnitude duration, and offset of responses in behavioural, experiential or physiological consequences of emotion generation" (Gross, 2002, p. 282)[1].

ER can increase (up-regulate) or decrease (down-regulate) emotional experience[2] by regulating prior to (antecedent-focused) or following an emotion (response-focused). The regulatory process can draw on internal or external resources to achieve up-regulation or down-regulation (Gross & Thompson, 2007). So for example, requesting company when walking home at night (external) might stop fear developing (antecedent-focused) or whistling to oneself during the walk (internal) might distract from the fear that does arise (response-focused). One way to understand how this process works is to examine it from a developmental perspective, and attachment theory facilitates this approach (Berry, Barrowclough, & Wearden, 2007; Drayton, Birchwood, & Trower, 1998; Mikulincer, Shaver, & Pereg, 2003;Thompson & Goodman, 2010). Availability and sensitivity of the caregiver to manage the child's early emotional reactions is thought to be the basis upon which ER develops (Thompson & Meyer, 2007). Consistent, sensitive and prompt caregiving leaves the child feeling secure and cared for, reducing negative emotional arousal and developing expectations that they will be soothed. This can be considered as functional regulation of the child's emotional needs in that the caregiver succeeds at down-regulating the emotions the child finds aversive. This function of the caregiver gradually becomes internalised by the child as they learn to understand and tolerate their own emotional states independent of others. In contrast, inconsistent or avoidant caregiving maintains or even increases negative emotional states in the child by leaving them

[1] For a review of the debate as to whether the process of ER can be separated from the generative process see Bloch et al (2010).
[2] See Canli et al (2009) for a review of the genetics involved in the development of ER.

psychologically and physiologically overwhelmed. Should this continue over time, their expectation will be that distress is hard to turn off, leaving them fearing emotional upset and making potential triggers of negative emotion increasingly aversive. In environments that are chronically dysfunctional, a child may need to either learn how to suppress their emotional distress if looking towards an avoidant caregiver, or maintain or increase their distressed state if looking towards an inconsistent caregiver. Over time this pattern can become less amenable to change (Thompson, 1994). For example, neuroticism (high trait anxiety) and extroversion (low trait anxiety) are polarised personality traits on a dimension of individual differences in the experience of positive and negative affective states, beliefs and cognitive predispositions (Costa & McCrae, 1988). High neuroticism may be one result of exposure to chronic early chaotic environments, maintaining or leading to a hyper-dopaminergic circuit (Grace, Floresco, Goto, & Lodge, 2007) which predisposes risk for psychopathology.

1.3 Development of emotion regulation as applied to populations with psychopathology

Chaotic or dangerous early environments can be barriers to successful ER developing (Cozolino, 2010;Gilbert & Procter, 2006). Children from such environments may have limited ways to regulate their emotions other than to avoid or suppress, having had limited opportunity to learn how to effectively down-regulate negative emotion and up-regulate positive emotion. Mennin & Fresco (2010) define maladaptive ER as, "*characterised by contextually invariant excesses, deficits, or liability or when regulatory efforts are not utilised, are deficient, are used excessively, or are enacted in rigid and inflexible ways*". Suppression and avoidance are typically viewed as maladaptive strategies (Gross, 1998, 2002) and have received the majority of attention. Both have been consistently associated with poorer psychological and functional outcomes (Campbell-Sills, Barlow, Brown, & Hofmann, 2006; Carver, Scheier, & Weintraub, 1989; Folkman & Lazarus, 1984, 1988; Gross, 1998, 2002). Suppression of unwanted thoughts or emotional expression in particular has been shown to actually increase physiological arousal and negative emotion (Gross, 1998; Gross & Thompson, 2007; Wenzlaff & Wegner, 2000). Continued use of suppression has also been associated with decreased emotional control, decreased happiness and increased levels of low mood, poorer memory and poorer social interactions (Gross, 2002), and also found to deplete cognitive resources more so than other strategies (Gross, 2002; Mauss, Bunge, & Gross, 2007). Experiential avoidance (EA) is a process

whereby internal private events such as thoughts, feelings or sensations are evaluated as negative and unwanted, resulting in efforts to deliberately avoid, push away or escape from these experiences (Hayes et al., 2004). EA lies at one end of a continuum, with psychological flexibility at the other end. The concepts are taken from Acceptance and Commitment Therapy (ACT; Hayes et al, 2004). The premise is that attempts to avoid or suppress emotional experience leads to greater distress while being open to experiences, acting in accordance with personal values and being present in the moment leads to greater psychological well-being (Hayes, et al., 2004). EA includes suppression, but acknowledges that such processes also impact upon resources such as attention and memory (Hayes, et al., 2004). Avoidance behaviours have also long been recognised as maladaptive (Rachman, Radomsky, & Shafran, 2008). In contrast with avoidance, but also maladaptive, ruminating on negative emotional experience or events and their causes appears to hamper good problem-solving and maintain emotional distress (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Watkins & Baracaia, 2002).

Earlier research from the context of coping with stressors has shown that there can be adaptive and maladaptive reactions (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Stress, like emotion, tends to be a reaction to arousing events (Gross & Thompson, 2007). This can trigger efforts to up-regulate or down-regulate (Gross, 2002). Two such strategies that are good at down-regulating are reappraisal and problem solving. Reappraisal is the ability to reinterpret or change perspective in order to reduce distress (Gross, 1998). This is an important strategy in psychological therapies such as Cognitive Behavioural Therapy (CBT) (Beck, 1976; Clark & Wells, 1995; Salkovskis, 1991). Likewise problem-solving, another strategy employed in therapeutic approaches, aims to regulate emotions through planning, solving and making effective decisions about the management of distressing problems (Beck, Emery, & Greenberg, 1985; Greenberger & Padesky, 1995). People who are good at this tend to be healthier psychologically, function better and have improved wellbeing (Bell & D'Zurilla, 2009; John & Gross, 2004; Moos, 1993; Watkins & Baracaia, 2002). Acceptance is also a strategy employed by therapies, although often in different guises (Hayes, 2004; Kabat-Zinn, 2003; Shapiro, Oman, Thoresen, Flinders, & Plante, 2008; Teasdale et al., 2000). Mindfulness therapies and ACT are means to adopting a present-focused, non-judgmental awareness that reduces distress caused by difficulties.

Emotional regulation is increasingly a target for specific modes of therapy (Barlow, et al., 2004; Hayes, 2004; Mennin & Fresco, 2010), with some acknowledging its role in specific disorders. As mentioned, reappraisal is developed in CBT to tackle depression and anxiety (Beck, et al., 1985). Problem-solving is also part of CBT. Whereas reduced problem-solving is implicated in substance misuse (Cooper, Wood, Orcutt, & Albino, 2003) and eating disorder (Fairburn, Cooper, & Shafran, 2003). Acceptance-based therapies have been extensively applied to depression and anxiety (Kabat-Zinn, 2006; Roemer, Erisman, Orsillo, Antony, & Stein, 2009; Teasdale, et al., 2000; Vanderhasselt & De Raedt, 2012) and avoidance has long been identified as key problems in anxiety and phobic disorders (Dugas, Gagnon, Ladouceur, & Freeston, 1998; Rachman, 1976; Rachman, et al., 2008) as well as PTSD (Ehlers & Clark, 2000). Rumination has also been linked to depression, anxiety, substance abuse and eating disorders (Nolen-Hoeksema, et al., 2008). Therefore, the evidence is growing that the identification of maladaptive ER strategies and the development of more adaptive approaches is an important step in understanding and treating a range of psychopathologies (Aldao & Nolen-Hoeksema, 2010; Aldao & Nolen-Hoeksema, 2012). The aim of this review is to highlight the research implicating the role of ER in psychosis and to explain why there is a need for further development in this area.

1.4 Emotion in the development of psychosis

Psychotic illness has a lifetime prevalence of 2-3% (McGrath, Saha, Chant, & Welham, 2008), which includes the more severe psychotic illness of schizophrenia (0.5-1% lifetime prevalence rate) as well as other forms that range from bipolar disorder to brief substance-induced psychotic illnesses. Symptoms of a psychotic illness include hallucinations and delusions, impairments in motivation, emotional dysregulation, and neurocognitive deficits that impede information processing and social functioning (van Os, Kenis, & Rutten, 2010). Psychosis is generally understood in terms of a *stress-vulnerability model*, a heuristic that recognises the interaction between genetic vulnerabilities to mental health and environmental risk factors that can expose vulnerabilities to stress (van Os, et al., 2009). Key to this interaction is the dopaminergic pathway within the brain. Dopamine is a neurotransmitter that is involved in the integration of bottom-up processes such as emotional activation with top-down processes of cognitive control (Cozolino, 2010; Grace, et al., 2007; Panksepp & Biven, 2012). Psychosis is thought to arise from an excessive

dopaminergic activation in the neural circuit that bridges bottom-up and top-down processes and leads to increased limbic (emotional) activation and decreased cortical activity (thinking) (Fett et al., 2011). A person with psychosis is thought to be more vulnerable to heightened emotional and physiological arousal to stressors because of this (Docherty, St-Hilaire, Aakre, & Seghers, 2009; Mathews & Barch, 2010; Strauss & Herbener, 2011). Symptoms of heightened arousal can be misinterpreted and later manifest as psychotic symptoms such as auditory hallucinations or delusional beliefs (Aghevli, Blanchard & Horan, 2003). For example high levels of subjective anxiety, coupled with physiological symptoms of anxiety that can include tingling, might lead a person to think they are being watched or threatened and that perhaps the tingling is someone trying to attack them with electronic devices, which causes them further distress. In this example, emotion has ceased to be fully functional, and instead is playing a key role in the development of psychotic symptoms. High neuroticism (trait anxiety) and lower levels of extroversion are also associated with psychosis (Berenbaum & Fujita, 1994; Lysaker, Wilt, Plascak-Hallberg, Brenner, & Clements, 2003). Neuroticism is associated with a larger number of positive psychotic (i.e.: hallucinations, delusions and paranoia) and affective symptoms and greater substance misuse (Berenbaum & Fujita, 1994; Lysaker, et al., 2003). Higher levels of neuroticism have also been found to be associated with the likelihood that voices will be attributed as malevolent (Lung, Shu, & Chen, 2009) and emotional distress from voices has been associated with the degree to which voices are considered omnipotent (Chadwick & Birchwood, 1994; Chadwick, Birchwood, & Trower, 1996).

1.5 Emotional dysfunction in psychosis

There is a large body of literature on the genetic causes in psychosis (van Os, Rutten, & Poulton, 2008), but this accounts for only 6% of predicted risk of developing psychosis compared to the 30% associated with having family members with mental health problems (Mortensen, Pedersen, & Pedersen, 2010). There is also a high prevalence of emotional disorder in people suffering from psychosis (van Os, et al., 2010), which often predates the onset of psychosis (Kimhy & Corcoran, 2008; van Rijn et al., 2011). For example, 68% of people in the prodromal phase of psychosis experience mood disorders (Yung et al., 1996). A person receiving a diagnosis of schizophrenia is likely to experience nearly all other DSM Axis I and Axis II psychiatric disorders (McMillan, Enns, Cox, & Sareen, 2009). In addition, 45% of those with diagnosed psychotic illness will experience depression and

anxiety associated with their positive symptoms alone (Birchwood, Iqbal, Chadwick, & Trower, 2000; Cosoff & Julian Hafner, 1998; Iqbal, Birchwood, Chadwick, & Trower, 2000), while some will develop further emotional difficulties due to the global and often traumatic nature of psychosis (Jackson, Knott, Skeate, & Birchwood, 2004; Morrison, Frame, & Larkin, 2003; Mueser, Lu, Rosenberg, & Wolfe, 2010). These reactions can be independent of or related to higher rates of developmental trauma such as child abuse or neglect, which have also been consistently recorded in this population (Bernard, Jackson, & Patterson, 2010; Frame & Morrison, 2001; Freeman & Fowler, 2009; Jackson, et al., 2004; Read, Perry, Moskowitz, & Connolly, 2001; Read, van Os, Morrison, & Ross, 2005; Thompson, 1994; Varese, et al., 2012). For such reasons, psychosis samples also have higher rates of insecure attachment patterns than non-clinical populations (Berry, Barrowclough, & Wearden, 2007; Liotti, Gumley, Moskowitz, Schafer, & Dorahy, 2008; Pickering, Simpson, & Bentall, 2008) and individuals with schizophrenia have higher levels of avoidant attachment patterns than non-clinical populations (Dozier, Cue, & Barnett, 1994; Dozier, Stevenson, Lee, & Velligan, 1991). Tarrier, Khan, Cater, & Picken (2007) also highlighted the dynamic relationship between emotional reactivity, suicide schemas and risk of suicide in psychosis by showing that increased negative emotional reactivity was associated with the activation of suicide schemas. For all these reasons, it is likely that psychosis populations have problems developing functional ER strategies.

As noted by prominent researchers within the field (Bentall, 2003; Freeman & Garety, 2003), historically the interaction between emotions and psychosis has been overlooked because of previously assumed differences in the aetiology of disorders. This is beginning to be put right, with much greater consideration being given to the idea that emotions could form a pathway to the illness (Birchwood, 2003; van Os, Linscott, Myin-Germeys, Delespaul, & Krabbendam, 2009). For example, people with psychosis can present with behavioural dysfunction in the form of flattened emotional expression (Kring & Caponigro, 2010), often have a physiological sensitivity for increased emotional arousal (Kring, Kerr, & Earnst, 1999) and subjectively can describe difficulties identifying and labelling emotion (Kring & Caponigro, 2010; Peer, Rothmann, Penrod, Spaulding, & Penn, 2004; van 't Wout, et al., 2007; Yu et al., 2011). This shift fits in with a growing understanding that most mental disorders share common aetiologies (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Boisseau, Farchione, Fairholme, Ellard, & Barlow, 2010; Harvey, Watkins, Mansell, & Shafran, 2004; Nolen-Hoeksema & Watkins, 2008) and that

mental health exists on a continuum with normal functioning (Freeman et al., 2005; Hanssen et al.; Johns & van Os, 2001). Hence old traditions of separating out the neuroses from the psychoses are being increasingly ignored (Freeman & Fowler, 2009; Hanssen, et al., 2003; Myin-Germeys & van Os, 2007; van Os, et al., 2010).

1.6 Potential role of emotion regulation in psychosis

Research into emotion dysfunction in psychosis has become increasingly important (Birchwood, 2003); therefore ER could be important in several domains of psychotic illness. To illustrate, two domains will be briefly discussed.

1.6.1 Emotion regulation in the formation of negative symptoms

As described earlier, expressive suppression is the inhibition of behavioural responses to emotional stimuli that can include inhibition of facial or vocal expressions (Gross, 1998; Kring & Neale, 1996). Intentional inhibition of non-emotional stimuli is often abnormal in people with schizophrenia (Frith, 1979) and this has been shown to significantly correlate with auditory hallucinations (Waters, Badcock, Maybery, & Michie, 2003; Westermann & Lincoln, 2011). Over-use of suppression has been associated with affective blunting (Kring & Caponigro, 2010), which has been associated with a poorer outcomes in psychosis (Aldao & Nolen-Hoeksema, 2010; Avery, Startup, & Calabria, 2009; Fenton & McGlashan, 1994). Recognising and labelling emotions, emotional awareness, can be a challenge for people with psychosis (Boden & Berenbaum, 2007; Gumley, 2011; Peer, et al., 2004), especially those who have experienced sexual trauma (Lysaker et al., 2003). This may relate to findings that indicate that people with psychosis find it difficult to amplify or up-regulate their emotional expression in accordance with their experience (Henry et al, 2007.). This may be why psychosis patients show an expression/experience disjunction (Aghevli, Blanchard, & Horan, 2003; Kring & Earnst, 1999; Kring & Neale, 1996). Discrepancy between the behavioural expression of emotion and the experience of emotion, especially in social contexts, can also lead to perceptual errors and the misunderstanding of emotional cues (Aghevli, et al., 2003). Gumley (2011) suggests these finding indicate poor levels of metacognition, a concept similar to Theory of Mind (Giannoni & Corradi, 2006) and Mentalization (Allen & Fonagy, 2006). All of which are attempts to conceptualise mental state understanding, a noted weakness in psychosis populations. ER strategies may be implicated in these problems because of their effect on

social functioning (Gross, 2002; John & Gross, 2004) and attention (Barrett, Gross, Christensen, & Benvenuto, 2001) as well as in several other ways.

1.6.2 Emotion regulation and positive symptoms

The content of delusions and hallucinations often represent distressing emotional states (Frame & Morrison, 2001; Freeman & Garety, 2003; Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001). Positive symptoms such as auditory hallucinations or voices are associated with depression and high levels of anxiety (Birchwood, 2003; Birchwood, et al., 2000; Frame & Morrison, 2001; Freeman & Garety, 2003), especially where there is a high level of stress involved (Udachina et al., 2009). Similarly, persistent and heightened anxiety is implicated in the development of paranoid thinking (Freeman, 2007; Freeman, Garety, Kuipers, Fowler, & Bebbington, 2001). Where maladaptive ER occurs, an exacerbation of paranoia could be expected. Thus, thought suppression has been shown to correlate with paranoid ideation (Jones & Fernyhough, 2009) and experiential avoidance has also been shown to be a significant predictor of paranoia in a non-clinical sample (Hayes, et al., 2004). ER may also mediate this relationship through the deployment of attention resources (Barrett, et al., 2001). However, it is also possible that more adaptive emotional regulation such as problem solving and re-appraisal may reduce positive symptoms like paranoia and delusions but it is possible that these more adaptive strategies are underdeveloped in psychosis samples for the reasons considered above.

1.7 Rationale for a systematic review of the literature

There is growing interest into ER and its role in the development of psychopathologies (Aldao et al., 2010). Emotion regulation is the ability to influence the type of emotion that is experienced, the timing of emotions and the expression of emotions (Gross, 1998, 2002). There has been a review, though theoretical in nature only, provided on coping in schizophrenia (Roe et al., 2006). There has also been one overview provided on ER in psychosis (Khoury & Lecomte, 2012), but the authors drew clinical conclusions only and did not critique theory or methodologies. Therefore the aim of this review is to investigate the role ER could play in the development and formation of psychotic symptoms as well as providing therapeutic implications. A critical analysis of strengths and weakness of studies that explicitly examine ER and also studies that implicitly investigate ER in the context of coping with psychosis will be provided. It is hoped this analysis will illustrate the theoretical and methodological challenges encountered in the field so far and provide ideas

about how to overcome them in order to further an understanding of ER and its role in psychosis and perhaps to better integrate related literature that share the subject.

2. Selection of research

2.1 Eligibility criteria of studies included in the review

Studies were selected for inclusion based on the following criteria:

1. Peer reviewed publication in an English language journal
2. The studies explicitly investigated populations with a diagnosis of psychosis, including schizophrenia, schizoaffective, schizophreniform disorder and psychosis not otherwise specified.
3. Studies were required to provide new empirical data, which had been analysed using appropriate quantitative statistical analysis.
4. The concept of ER was defined according to recent and widely accepted definitions which were stipulated above (Gross & Thompson, 2007; Kring & Sloan, 2010).
5. Studies included in the review provided an attainable abstract and full text.
6. Studies (719 in total) were excluded if it was not possible to obtain further information other than the title of the study, the design of the study was not relevant (e.g.: qualitative, single case), the study was a background discussion, not a psychosis population or was a duplicate study. Studies in a foreign language or with no measure of ER were also excluded from the review.

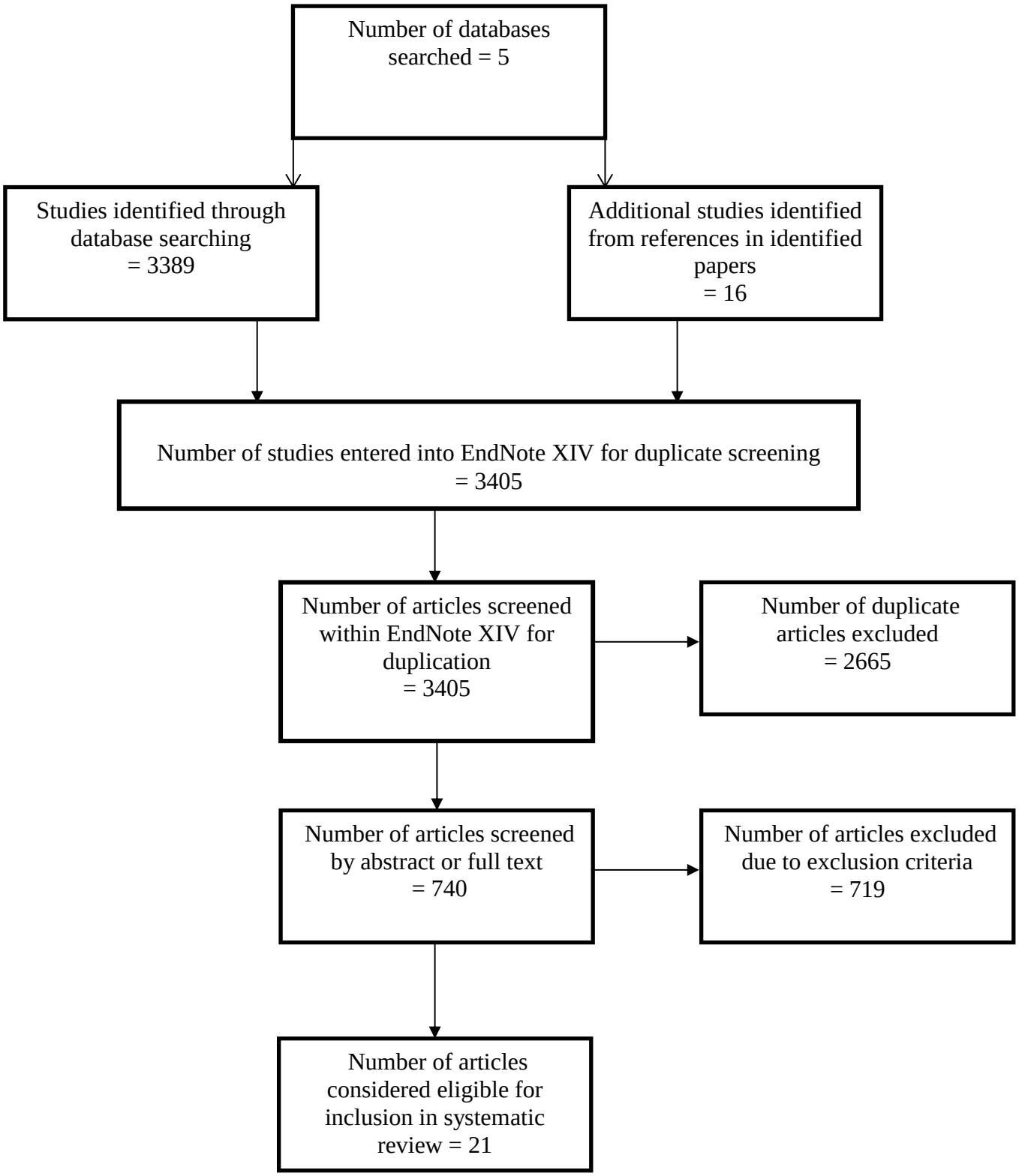
2.2 Search strategy for the identification of relevant articles

EMBASE (1980-March 2013), Medline (R) (1946-March 2013), PSYCINFO (1987-March 2013) and Web of Science (All years) databases were searched for articles containing key words or text words of either EMOTION*, REGULAT*, DYSREGULAT*, COP* in combination with PSYCHO*, SCHIZOPHREN*. All results were then imported into EndNote XIV and further screened using its search engine for suitability according to the above criteria. (see Aldao, Nolen-Hoeksema & Schweizer, 2010 for precedent). A flow chart of the study selection process is displayed in Figure 2.1., which shows how the final 21 papers were identified for inclusion.

2.3 Quality rating system

A systematic quality review of methodologies employed within the studies was carried out using ratings constructed by Gilbert (2009) who rated using National Institute for Health and Clinical Excellence guideline checklists (NICE, 2007) (see Appendix 1 for its use).

Figure 2.1: Information flow on study selection



3. Explicit Measures of Emotion Regulation

The following section examines studies that used an explicit measure of ER. These measures fit with the definition of ER as a process that can be automatic or controlled and a conscious or unconscious process whereby emotions are influenced in self, others, or both (Boch, Kring & Werner, 2010). In addition ER involves changes in emotion dynamics, or the latency, rise time, magnitude duration, and offset of responses in behavioural, experiential or physiological consequences of emotion generation (Gross, 2002). The measures used in the studies in this section sought to explicitly measure a part of this process directly.

3.1 Description of studies using explicit measures of emotion regulation

Of the ten studies reviewed in Table 3.1, five were cross-sectional in design (Badcock, Paulik, & Maybery, 2011; Henry, Rendell, Green, McDonald, & O'Donnell, 2008; Livingstone, Harper, & Gillanders, 2009; Owens, Haddock, & Berry, 2012; van der Meer, van't Wout, & Aleman, 2009), four were sample-control studies (Goldstone, Farhall, & Ong, 2011; Kimhy et al. 2012; Perry, Henry, & Grisham, 2011; Suslow, Roestel, Ohrmann, & Arolt, 2003) and one was experimental (Perry, Henry, Nangle, & Grisham, 2012). All looked at chronic patients only. All the studies constructed a sample group that included schizophrenia as well as schizoaffective and schizophreniform patients, with two studies failing to specify the sample composition (Livingstone, et al., 2009; van der Meer, et al., 2009). All the studies used samples of mixed gender. Studies included participants of different ages and at difference phases of their illness that included stable to unstable or acute phase and outpatient or inpatient status. All the studies derived their data from psychometric or neuropsychological assessment and questionnaires.

From the ten studies in Table 3.1, measures of ER included the Emotion Regulation Questionnaire (Garnefski & Kraaij, 2007; Kontos, Freudenreich, & Querques, 2006), the Difficulty in ER Scale (Gratz & Roemer, 2004), Regulation of Emotion Questionnaire (Phillips & Power, 2007; Phillips, 2005), Emotion Control Questionnaire (Roger & Najarian, 1989; Roger & Nesshoever, 1987), the Acceptance and Action Questionnaire (Hayes, Strosahl, Wilson, Bissett, & Pistorello, 2004), and one study used an experimental paradigm to test regulatory strategies of suppression and reappraisal (Perry et al., 2012).

Table 3.1 Explicit measures of emotion regulation

	Author(s) & Year	Design	Aims/Objectives	Sample Characteristics	Measures of ER	Measures of Distress & Psychopathology	Summary of Results	Quality
1	Badcock, Paulik & Maybery (2011)	Cross-sectional	Association between ER strategies and auditory hallucinations (AH),	34 inpatient and community patients (82.4%) with schizophrenia or schizoaffective disorder (24 M, Mean Age = 37.91)	ERQ	HADS PSYRATS PSWQ RRS	No main effect for ERQ strategies and group. Greater use of suppression associated with an increase in severity of AH.	+
2	Goldstone, Farhall & Ong, (2011)	Sample-control	Whether experiential avoidance is a mediator between life hassles and delusional ideation.	100 outpatients in non-acute phase of schizophrenia (82%) & schizoaffective disorder (18%) (41% M, Age not given).	AAQ	Peter's Delusions Inventory (PDI)	Experiential avoidance was a significant mediator between life hassles and delusions and delusional distress Suppression or avoidance of unwanted thoughts associated with distressing delusions	++
3	Henry et al (2008)	Cross-sectional	Whether patients differ from controls in use of suppression and reappraisal	36 outpatients and 5 in-patients with a diagnosis of schizophrenia (32) and schizoaffective disorder (9) (46% M, Mean age 37.5)	ERQ	HADS SAPS & SANS SFS WASI NART	No difference in suppression or reappraisal between groups but use of reappraisal associated with better social functioning	++
4	Kimhy et al (2012)	Sample-control	Compare emotional awareness and ER between schizophrenia patients and controls	44 Inpatients & outpatients with DSM diagnosis of schizophrenia (35), schizoaffective (3) schizophreniform (3) and psychosis NOS (3) (64% M, Mean Age 30.33)	ERQ	MATRICS PSRS BCIS TAS-20	Patients used more suppression and less reappraisal Use of suppression associated with lower social functioning and reappraisal associated with greater social functioning Suppression associated with difficulty identifying and describing emotions	++
5	Livingston, Harper & Gillanders (2009)	Cross-sectional	Whether ER strategies differ between psychosis, anxiety/depression patients and non-patient controls.	21 schizophrenia, schizoaffective, psychosis or bipolar disorder with psychotic episode outpatients (12 M, Mean Age 39.26)	ERQ REQ	BES	Patient groups employed reappraisal strategies equally but no significant main effect for strategies. More internal dysfunctional strategies and less internal functional strategies used by patients	+
6	Owens, Haddock &Berry 2012	Cross-sectional	Whether insecure attachment is associated with greater	Staff-patient dyads: 49 patients with a schizophrenia (41),	DERS	PAM COPE	Attachment avoidance and anxiety associated with ER difficulties DERS associated with COPE, maladaptive ER	++

	Author(s) & Year	Design	Aims/Objectives	Sample Characteristics	Measures of ER	Measures of Distress & Psychopathology	Summary of Results	Quality
			ER difficulties	schizoaffective disorder (3) or psychosis NOS (5) from a 24-hr rehabilitation service (42 M, Mean age 38.06)			correlated with maladaptive coping	
7	Perry et al 2012	Experiment	Explore ER strategies in people with schizophrenia compared to controls	25 outpatients with clinician rated DSM-IV-TR diagnosis of schizophrenia (16) or schizoaffective disorder (9) (40% M, Mean age 42.2)	Self-report ER/Re-experience Questionnaire	WASI NART SAPS SANS DASS Emotion Self-report Questionnaire Surface EMG	Reappraisal resulted in lower sadness compared to expressing or accepting feelings	++
8	Perry, Henry & Gisham (2011)	Sample-control	To investigate habitual use of ER strategies as well as acceptance in a psychosis population compared to controls.	33 outpatients with schizophrenia (20) or schizoaffective disorder (13) (42% M, Mean Age 43.7)	ERQ AAQ	SANS & SAPS WASI SFS DASS	No main effect of ER but suppression associated with poorer social functioning and reappraisal associated with less depression and negative symptoms. Lower acceptance within patients and acceptance associated with better depression and anxiety scores	+
9	Suslow et al 2003	Sample-control	Examine emotion control across subgroups of chronic schizophrenia patients compared to controls.	88 chronic inpatient (21) & outpatients (67) with DSM-IV diagnosis of schizophrenia	ECQ	SANS & SAPS DES	Effect of gender in rehearsal and emotion inhibition Flat-affect and anhedonic patients used more rehearsal and had lower inhibition and aggression control	++
10	Van der Meer, van't Wout & Aleman (2009)	Cross-sectional	Relationship between ER, alexithymia & pre-morbid IQ	31 Non-acute schizophrenic outpatients (24 M, Mean age 32.3)	ERQ	BDI PANSS NART BVAQ	Patients use more suppression and less reappraisal	++

Key: AAQ = Acceptance & Action Questionnaire; BCIS = Beck Cognitive Insight Scale; BES = Basic Emotions Scale; BVAQ = Bermond-Vorst Alexithymia Questionnaire; COPE = Coping Orientations to Problems Experienced Scale; DASS = Depression Anxiety Stress Scale; DERS = Difficulties in Emotion Regulation Scale; ECQ = Emotion Control Questionnaire; EMG = Electromyography; ERQ = Emotion Regulation Questionnaire; HADS = Hospital and Anxiety Scale; MCCS = MATRICS Consensus Cognitive Battery; NART = National Adult Reading Test; PAM = Psychosis Attachment Measure; PANSS = Positive and Negative Psychotic Symptoms Scale; PDI = Peter's Delusions Inventory; PSRS = Provision for Social Relations Scale; PSWQ= Penn State Worry Questionnaire; PSYRATS = Psychotic Symptoms Rating Scale; REQ = Regulation of Emotion Questionnaire; RRS = Ruminative Response Style; SANS = The Scale for the Assessment of Negative Symptoms; SAPS = The Scale for the Assessment of Positive Symptoms; SFS = Social Functioning Scale; TAS-20 = Toronto Alexithymia Scale; WASI = Weschler Abbreviated Scale of Intelligence

3.2 Quality of studies using explicit measures of emotion regulation

Seven of the ten studies were rated as good quality while three were rated as fair (Badcock, et al., 2011; Livingstone, et al., 2009; Perry, et al., 2011). All studies failed to report the number of people who declined to participate and no assessment was provided as to differences between participants and non-participants[3]. Only the Goldstone study reported the time frame of the research. Actual *p*-values were reported in all but one of the three studies (Livingstone, et al.; Perry, et al.; Suslow, et al.). The majority of studies did not take steps to control for known and potential confounds including dosage of medication (Kring & Earnst, 1996; Santor, Bagby, & Joffe, 1997; Stanton, Danoff-Burg, Cameron, & Ellis, 1994), handedness, gender and age (Cozolino, 2010). All the studies in Table 3.1 included patients diagnosed with schizoaffective disorder in their sample. Inclusion of patients with clear affective differences and failure to screen samples with potentially atypical emotional profiles partially undermined the studies' validity.

3.3 Review of studies using explicit measures of emotion regulation

Several different measures are used within the studies in Table 3.1. Bar Owens et al., all studies aimed to explicitly define and measure either a global concept of ER or some component of ER.

3.3.1. Studies using the ERQ to assess emotion regulation

The Emotional Regulation Questionnaire (Gross & John, 2003; Kontos, et al., 2006) was most commonly used within the studies, with its theoretical conceptualisation stemming from a specific model of ER (Gross, 1998; Gross & Thompson, 2007). It is derived from Gross's (1998, 2002) definition of ER referred to earlier, and seeks to measure two strategies of ER, expressive suppression and cognitive reappraisal. The most common use of the measure was to discern whether there were differences between psychosis samples and non-clinical and other clinical samples. Several studies found that patients differed in their use of suppression and reappraisal. Van der Meer et al (2009) found that psychosis patients used significantly more suppression and less reappraisal strategies than non-clinical control groups. Livingstone et al (2009) found that reappraisal was used less by psychosis patients than controls but only found a trend towards greater use of suppression

[3] This is a potential pitfall when studying a psychosis population because patients with high levels of negative symptoms are underrepresented in the literature due to their reluctance to participate in research.

in psychosis patients. They also compared non-psychotic anxiety and depression patients to the psychotic patients and found that there were no differences between the two clinical samples in their use of suppression or reappraisal. Kimhy et al (2012) reported similar results to van der Meer et al by showing that psychosis patients used less reappraisal and more suppression than non-clinical controls. In addition, they found that use of suppression was associated with poorer social functioning while reappraisal was associated with better functioning. Suppression was also found to be related to greater difficulty identifying and describing emotions, a deficit indicative of alexithymia (Sifneos, 1996).

Despite differences being found in the use of ER strategies between psychosis patients and non-clinical samples, there has also been a pattern of null findings. Henry et al (2008) found no significant differences between psychotic patients and controls in their use of either suppression or reappraisal. Nor did they find a relationship between ER and blunted affect. However they did find a positive relationship between the use of reappraisal and social functioning as well as finding that suppression was associated with poorer social functioning. They also found an association between depressive symptoms and suppression in the control group. Their overall conclusion was that problems up-regulating rather than down-regulating emotion was the issue for people with psychosis. Perry and colleague's (2011) also found no group main effect of suppression or reappraisal, although reappraisal was again associated with better functioning and suppression with poorer functioning. Their study also identified that suppression was associated with higher levels of depressive symptoms and negative psychotic symptoms. Specifically, reappraisal was associated with a reduction in negative symptoms. Badcock et al (2011) also found no difference between psychosis patients and non-clinical controls in use of strategy but did find that use of expressive suppression was associated with the increased frequency, duration and loudness of voices, independent of negative emotions. They also found that control participants who had greater use of suppression also scored higher on symptoms of depression and anxiety than those who used reappraisal. Rumination and worry were also associated with increased distress associated with symptoms and lead to higher rates of depression and anxiety.

3.3.2 Findings from other measures (ECQ, AAQ, DERS, REQ)

Suslow et al., (2003) used the Emotion Control Questionnaire (ECQ) to assess their sample of psychosis patients in their use of ER and compared them to a non-clinical group. The

ECQ differs from the ERQ in that it originates from personality and stress literature, examining stable emotion control strategies individuals tend to use in response to stress (Roger & Nesshoever, 1987). Psychosis patients were first divided into three groups according to their emotional response pattern as classified by their responses on the Scale for the Assessment of Negative Symptoms (SANS, Andreasen, 1984). The groups were composed of anhedonic patient (i.e.: people with enhanced negative emotional experiences and reduced positive emotional experiences), affectively blunted and non-affective psychosis patients. The aim was to measure emotion control strategies across these groups rather than using diagnostic category. The ECQ consists of four factors, 1) the control of emotion, 2) rehearsal, akin to rumination; 3) emotion inhibition, akin to suppression, 4) benign control and aggression control (the latter two being forms of impulsivity). The results indicated that rehearsal correlated with negative emotions and interestingly extrapyramidal symptoms. Greater benign control was related to a reduction in negative emotional experiences. Rehearsal was used more by anhedonic patients and patients with flattened emotional expression, compared to healthy controls. Greater emotion inhibition was negatively correlated with anhedonia and anhedonic patients showed lower levels of aggression control and inhibition compared to healthy controls. Rehearsal as well as emotion inhibition was used more by females than males across all groups in this study. Lastly, Suslow et al (2003) also looked at emotional experiences within their samples, collecting self-report data on emotions these groups commonly experienced. They found that patients showed significantly higher levels of negative emotions such as fear and sadness and less happiness compared to controls. However there were differences within the patient groups as identified by the SANS regarding their typical emotional experiences. These findings point to the importance of assessing the emotional profile of the participants before assessing ER due to discrete subgroups existing within the diagnostic categories.

Goldstone at al. (2011) used the Acceptance and Action Questionnaire II (Hayes, et al., 2004), a measure that is positively correlated[4] with the suppression subscale of the ERQ (Gross & John, 2003), to examine experiential avoidance (EA) within patient and control groups. EA is one end of a dimension axis with psychological flexibility being at the other end, with the concepts taken from Acceptance and Commitment Therapy (Hayes,

[4] This is only a modest correlation (.28) so the measures do not overlap completely, indicating they are capturing different factors (Kashdan, 2007).

2004). They found that higher scores on the AAQ-II, indicated greater use of avoidance and suppression strategies which mediated the levels of delusional symptoms and distress following a stressful event. Perry et al (2011) also used the AAQ and found that psychological flexibility was also associated with reduced symptoms.

Owens, Haddock and Berry (2012) took a slightly different approach to questions surrounding ER in a psychosis population. They examined the ability of their psychosis sample to regulate emotions within a therapeutic relationship and related this ability to attachment patterns. They used the Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004), which assesses 1) non-acceptance of emotional responses, 2) ability to remain engaged on goal-directed tasks, 3) impulse control difficulties, 4) emotional awareness and understanding and 5) number of available regulatory strategies. They found that insecure attachment patterns, a marker for early interpersonal difficulties, were directly related to ineffective ER strategies such as avoidance and suppression. In people with insecure attachments, dysfunctional strategies were more prevalent than adaptive strategies such as problem-focused strategies, inhibiting interpersonal functioning and the ability to build therapeutic alliances. They also found that DERS scores indicating maladaptive ER correlated with scores indicating maladaptive coping on the COPE, a measure discussed in more detail later.

Perry et al (2012) constructed experimental conditions that explicitly tested the effect of acceptance, reappraisal and suppression following emotionally evocative stimuli that were positive and negative in valence in patients and controls. Reappraisal was reported by both groups as more effective at managing emotional responses. Use of acceptance in response to emotionally evocative stimuli only proved successful for controls in facilitating willingness to re-experience sadness as psychosis patients appeared to find this strategy ineffective. Psychosis patients also showed greater brow reactivity, a subtle behavioural expression of emotion, in comparison to controls. Overall psychosis patients and control participants did not differ in use of strategy however psychosis patients were more unwilling to re-experience emotions with a negative valence compared to controls.

Livingstone et al (2009) also used the Regulation of Emotion Questionnaire (REQ) (Phillips & Power, 2007) along with the ERQ in their study. This measure was developed for children and adolescents which categorised strategies as functional or dysfunctional (in relation to acceptance or rejection of an emotion) and also as internal (e.g.: cognitive change) or external regulatory (e.g.: environmental change). Results showed that patients

used more internal dysfunctional and less internal functional strategies than controls. There was also a trend towards greater use of external functional strategies by controls.

4. Implicit Measures of Emotion Regulation (Coping)

People with psychosis have to cope with the overall impact of having a severe and often enduring mental illness (Cohen, Hassamal, & Begum, 2011; Roe, Yanos, & Lysaker, 2006). This can include emotional problems such as depression and anxiety associated with psychosis, reduced functioning due to these problem and the impact of psychotic symptoms, which can be traumatising (Morrison, et al., 2003; Mueser, et al., 2010). There is also the socio-economic fallout of having an illness that can induce feelings of shame and social stigma (Birchwood et al., 2007; Gilbert & Procter, 2006; Turner, Bernard, Birchwood, Jackson, & Jones, 2013). All of which greatly impact on personal wellbeing and self-esteem. Problems dealing with any one of these issues can impact on the others, increasing symptoms, which in turn interact with one or all other aspects. This makes the coping process an interactive one. The idea of coping strategies emerged from literature on defence mechanisms, whereby internal conflicts were dealt with by altering perceptions in order to reduce distress (Roe, et al., 2004). In a similar but broader way, the idea of adaptive coping facilitates recovery from symptoms, increases functioning and promotes wellbeing and self-esteem (Roe et al., 2006). Maladaptive coping on the other hand exacerbates symptoms and negatively impacts on or inhibits recovery of self-esteem, social status or functioning (Roe, et al., 2006). But conceptualising coping is difficult, and ever more so given the theoretical developments that have moved the concept away from "a response to stressor" definition and towards a process that can be proactive or anticipatory. This shift in conceptualisation also means there is overlap with the concept of ER, especially when using the definition supplied by Gross & Thompson (2007). For example, in the previous section Owens et al showed that dysfunctional ER strategies correlated with dysfunctional coping strategies. This means some of the coping literature is relevant to ER, although a complete incorporation of both sets of literature is beyond the scope of this review. Readers are directed to Roe, Yanos and Lysaker (2006) for a more complete review on coping in schizophrenia, who themselves acknowledge previous work (Schwarzer & Taubert, 2002). The current review draws on this work for a working definition of coping;

> "…a nonlinear dynamic process in which types of coping are differentially used over time to address the numerous challenges posed by the illness and its aftermath" (Roe et al., 2006, p. 918)

The distinction is also made that coping employed is a cognitive-transactional process that;

> "…is initiated and maintained by a person's cognitive appraisal of present or potential stressors; this perspective is in accord with the view that how an individual responds to or copes with symptoms and other experiences related to [serious mental illness] depends on the appraisal of both self and stressor". (Roe, Yanos & Lysaker, 2006, p. 2)

The distinctions between coping styles are fourfold (Roe, et al., 2006). *Reactive coping* is an attempt to deal with past or present stressors and their consequences. This process is transactional and takes place between the person and their environment by them either dealing with the emotional impact of the stressor upon them (emotion-focused) or by directly tackling the stressor (problem-focused). In the case of someone with psychosis this becomes further complicated because a symptom can be an emotional reaction to a stressor (i.e.: ashamed of being "mad") and the stressor itself (i.e.: shame). This highlights the importance of context when attempting to define a coping strategy, especially if evaluating it as adaptive or maladaptive. For example, an avoidant coping strategy may be considered maladaptive from a mental health professional point of view in that it might impede social and occupational recovery and reduce opportunity for the development of protective factors. However from a patient point of view less activity can result in a reduction of psychotic symptoms and the resulting distress from them which can also be evaluated as adaptive. Such a distinction is better understood when examining other forms of coping. *Anticipatory coping* is the attempt to reduce the anticipated impact of a stressor expected to happen in the near future. *Preventative coping* is a "just in case" strategy that builds resources and resilience for the possibility of an unknown stressor occurring. *Proactive coping* is the process by which a person generates new opportunities, challenges or goals with which they can develop a new sense of meaning or control. This process is long-term and can also lead to changes in a sense of self which will alter how stressors will be appraised. For the purposes of this review, findings relating to reactive and anticipatory coping will be solely focused on due to their temporal quality. This is in keeping with the conceptualisation that emotion and its regulation is object-specific, rapid in its response and short lived (Gross, 1998, 2002; Gross and Thompson, 2007)

4.1 Description of studies using implicit measures of emotion regulation

Of the eleven studies reviewed in the table, four were longitudinal (Boschi et al., 2000; Horan, et al., 2007; Strous, Ratner, Gibel, Ponizovsky, & Ritsner, 2011; Venturaet al., 2004), four were cross-sectional studies (Gozdzik-Zelazny, Borecki, & Pokorski, 2011;

Horan et al., 2007; Lysaker, Clements, Wright, Evans, & Marks; Lysaker, et al., 2003) and three were sample-control studies (Horan & Blanchard, 2003; Pruessner, Iyer, Faridi, Joober, & Malla, 2011; Ritsner et al., 2006; Ventura, Nuechterlein, Subotnik, Green, & Gitlin, 2004). Of these, three looked at first episode patients (Boschi, et al., 2000; Pruessner, et al., 2011; Ventura, Nuechterlein, Subotnik, Green, & Gitlin, 2004) and eight looked at chronic relapsing patients (Gozdzik-Zelazny, et al., 2011; Horan & Blanchard, 2003; Horan, et al., 2007; Lysaker, et al., 2001; Lysaker, et al., 2003; Lysaker, et al., 2011; Ritsner, et al., 2006; Strous, et al., 2005). Studies either combined schizophrenia, schizoaffective and schizophreniform disorders into one schizophrenia/psychosis group, selected paranoid schizophrenia patients only (Gozdzik-Zelazny, et al.), selected the five subtypes of schizophrenia patients (Ritsner, et al., 2006; Strous, et al., 2011) or did not specify (Horan & Blanchard, 2003; Horan, et al., 2007). All the studies used samples of mixed gender, apart from one which used males only (Horan & Blanchard, 2003). Like Table 3.1 studies included a range of descriptors for patients at difference phases of their illness, which included stable and unstable phase or acute and outpatient or inpatient status. The majority of the studies employed psychometric or neuropsychological assessment and questionnaire based data gathering techniques, with one study utilising role play techniques (Horan & Blanchard, 2003). Overall, there were twelve measures of coping which provide some implicit measures of ER. These included the Coping Inventory for Stressful Situations (Endler & Parker, 1990), Ways of Coping Questionnaire (Folkman, et al., 1986; Lazarus & Folkman, 1988), COPE (Carver, et al., 1989), Coping Response Inventory (Moos, 1993), Metacognitive Assessment Scale (Semerari et al., 2003) and one idiosyncratic measure of coping (Boschi, et al., 2000). These measures all employed a distinction in coping style between approach (adaptive) or avoid/escape (maladaptive) strategies that could be further divided into cognitive, behavioural or social in orientation. This last point illustrates an acknowledged difficulty within the literature (Roe, et al., 2006) in the variation in coping definitions. To overcome this we have attempted to employ a previously employed method of distinction between avoidant/approach coping (moving away or towards a stressor) and emotion-focused/problem-focused (describing which aspect of the stressor is being focused on and coped with) (Yanos, Knight, & Bremer, 2003).

4.2 Quality of studies using implicit measures of emotion regulation

Of the eleven studies in this section, nine of them were rated good in quality and two were fair. Only one of the studies recruited a sample population which we deemed unsuitable to the aim of the study (Gozdzik-Zelazny, et al., 2011). Most studies failed to report how many people refused to participate, so provided no assessment of differences between participants and non-participants (Gozdzik-Zelazny, et al., 2011; Horan & Blanchard, 2003; Lysaker, et al., 2003; Pruessner, et al., 2011; Ventura, et al., 2004). This is a problem in psychosis research as it has been identified that patients with more severe negative symptoms are under-represented in research (Bentall, 2003). This is particularly a problem for research into ER because this population may have a different emotional profile that impacts on the utility of findings. Time frame for recruitment was also under reported, meaning there was no way a reader could understand the time frame subjected upon the participants (Gozdzik-Zelazny, et al., 2011; Horan & Blanchard, 2003; Lysaker, et al., 2003; Pruessner, et al., 2011; Ritsner, et al., 2006; Ventura, et al., 2004). Given the temporal aspect to coping and ER (Gross & Thompson, 2007), it will be important to thoroughly report this in order to control for possible confounds (i.e. patients getting better over time). Coping strategies can change over time and may be related to stages of illness (Santor, et al., 1997; Stanton, et al., 1994). The studies also consistently included participants at different stages of illness and ages reducing their ability to shed light in individual factors involved in stress and coping within psychosis. As in Table 1, many of the studies in Table 2 did not report controlling for potential confounds to emotional experience as type and dosage of medication (Bentall, 2003; Herbener, Harrow, & Sands, 2000; Kring & Earnst, 1999; Lewander, 1998), handedness gender or age (Cozolino, 2010). Actual *p*-values were also only reported in five of the eleven studies (Gozdzik-Zelazny, et al., 2011; Lysaker, et al., 2003; Pruessner, et al., 2011; Strous, et al., 2005; Ventura, et al., 2004).

Another critical confound was the use of patients with a diagnoses of schizoaffective disorder. Given this populations marked emotional difference in clinical presentation to patients diagnosed with non-affective schizophrenia, Type II errors may be more likely if this group of patients is included, especially as there already exists the likelihood of atypical emotional profiles within subgroups of schizophrenia patients (Holt et al., 2009; Strauss & Herbener, 2011; Suslow, et al., 2003).

4.3 Review of studies using implicit measures of emotion regulation (coping)

There are several different measures of coping style, with the studies reviewed opting to employ several of these. The following review of the studies will therefore present them according to which measure was used.

4.3.1 Findings from studies using the CISS

The Coping Inventory for Stressful Situation (CISS) (Endler & Parker, 1990) categorises people's reaction to a stressor as i) task-oriented, ii) emotion-orientated or iii) avoidance-orientated coping. Three studies used this measure (Gozdzik-Zelazny, et al., 2011; Ritsner, et al., 2006; Strous et al, 2005). Gozdzik-Zelazny, Borecki & Pokorski, (2011) examined differences between depressed and non-depressed psychosis patients. They found that depressed psychosis patients used more emotion-focused coping and less task-orientated coping than non-depressed patients. They also showed that depressed patients scored higher on measures for external locus of control than non-depressed patients and were less inclined to seek social support. Ritsner et al (2006) found that task-avoidance coping was used more by patients than controls and this was associated with greater emotional distress. They found no difference in avoidance coping however did see a relationship between self-efficacy and avoidance coping. These results were very close to that of Strous et al (2005) who also found that task-orientated coping was used less by patients compared to controls, but that this was mediated by self-efficacy. Coping also changed in response to the level of distress being experienced, which was often marked by the stage of the psychotic illness and the presence of positive symptoms. Their conclusion was that a transactional relationship existed between emotional distress, self-efficacy and social support which resulted in coping strategy.

4.3.2 Findings from studies using the CRI

Two studies (Horan, et al. 2007; Ventura, et al., 2004) used the Coping Response Inventory (CRI) (Moos, 1993), which categorises coping according to approach or avoidance strategies. These two categories are further differentiated by whether the strategy is cognitive (*approach*-logical analysis, positive reappraisal; *avoid*-cognitive avoidance, acceptance/resignation) or behavioural (*approach*-seeking social support, problem-solving; *avoid*-seeking alternative rewards, emotional discharge). Horan et al (2007) found that schizophrenia patients had lower levels of approach coping (actively seeking out emotional or instrumental support, logical thinking, problem-solving) than

controls but there was no differences found in avoidance coping. They also found that social supports were much greater for controls than for patients, who also reported significantly lower self-esteem scores. Ventura et al also found lower scores in approach coping in psychosis patients compared to controls but again found not difference in avoidance coping. They also found that higher approach-coping- was associated with higher self-efficacy, better sustained attention and perceptual discrimination.

Boschi et al (2000) employed questions that categorized responses into active (cognitive or behavioural) or avoidant styles. Although not the CRI, their questions and categorization was based on similar theoretical underpinnings used to construct the CRI. They examined FEP and chronic psychosis patients across 24 months at different time periods. They found that active-behavioural strategies were reported as most helpful overall in dealing with symptoms of both psychosis and emotional dysfunction. They found no direct relationship between functioning and coping strategy but overall found symptomatology and functioning to be associated with active-behavioural coping such as talking with a professional, keeping busy or praying.

4.3.3 Findings from studies using the WCQ

Three studies (Lysaker, et al., 2001; Lysaker, et al., 2003; Lysaker, et al., 2011) used the Ways of Coping Questionnaire (WCQ) (Folkman & Lazarus, 1988). This measure categorises coping behaviour according to eight subcategories (confrontive, distancing, self-control, seeking social support, accepting responsibility, escape avoidance, planned problem-solving and positive reappraisal). However in all three studies using the WCQ, the authors modified the subscales or used only a selection of them. Lysaker et al (2001) looked only at escape –avoidance and found that this strategy was associated with higher levels of hope, self-efficacy and well-being. Greater neurocognitive deficits also correlated with greater hope, self-efficacy and well-being. Their conclusion was that a reduced ability or willingness to engage with the negative associations to self that come with psychosis was reduced if avoidance and neurocognitive deficits were in play. Lysaker et al (2003) found that problem-solving and seeking social support was used less by the patients compared to controls. Patients tended to use strategies of avoidance or escape, which was related to increased levels of trait reactivity or neuroticism. Their findings point to an interaction between self-esteem, emotional reactivity, and symptoms. Lysaker et al (2011) adapted the WCQ to assess considering strategies (thinking and talking to others about

what to do), ignoring (putting stressors out of one's mind) and resigning (perceiving there is nothing that can be done). They also employed an assessment of a subcomponent of metacognition called mastery as measured by the Metacognition Assessment Scale (MAS: Semerari et al, 2003) to organise a mixed sample of schizoaffective and schizophrenia patients in accordance with their scores on the MAS. Low mastery indicated a person was unable to plausibly represent psychological challenge while high mastery meant that problems could be coped with through cognitive means. Higher mastery also correlated with higher scores on neurocognitive measures. They found that the majority of patients fell within the low to medium range, associated with lower levels of insight. Greater insight and reduced avoidance coping was associated with higher mastery Schizoaffective patients also tended to have higher levels of mastery than non-affective schizophrenia patients. In regard to the WCQ, considering style was associated with high the mastery group and resigning style was used more by the intermediate group, which was made up mostly of schizoaffective patients.

4.3.4 Findings from studies using the COPE and measures of active coping

The COPE (Carver, et al., 1989) was used in two studies (Horan & Blanchard, 2003; Pruessner, et al., 2011) and assesses maladaptive (denial, acceptance, behavioural disengagement) or adaptive coping strategies (active coping, acceptance). Horan and Blanchard (2003) examined stress and emotional responses in a sample of schizophrenia patients during a social role play task. They found that patients used more maladaptive coping (denial, mental or behavioural disengagement) compared to controls but there was no difference in adaptive coping (active coping or acceptance) between the two groups. Maladaptive coping also correlated with increased emotional state.

Table 3.1 Implicit measures of emotion regulation in psychosis (coping)

	Author(s) & Year	Design	Aims/Objectives	Sample Characteristics	Implicit measures of ER	Measures of Distress & Psychopathology	Summary of Results	Quality
11	Boschi et al (2000)	Longitudinal	Explore how schizophrenia patients cope with psychotic symptoms	95 FEP inpatients with DSM (SCID-III-R) diagnosis schizophrenia (76), schizoaffective (17) or schizo-phreniform (2) disorder (66.3% M, Mean Age = 50% 18-22)	18 yes/no questions on coping	BPRS-A SANS & SAPS GAF BHS HDS QLS	Active-behavioural strategies most helpful and leading to less symptoms on BPRS, SANS and SAPS with higher BHS, GAF scores	++
12	Gozdik-Zelazny, Borecki & Pokorski, 2011	Cross-sectional	Establish psychological profile of depression-prone schizophrenic patients.	49 patients with ICD-10 diagnosis of paranoid schizophrenia (31 M, Mean Age 41.6)	CISS	BDI-II DDI UWIST STAI	Depressive psychosis patients used more emotion-orientated coping.	+
13	Horan & Blanchard 2003	Sample Control	Association between affect, coping and neurocognitive functioning among people with schizophrenia.	36 male outpatients with a DSM- IV diagnosis (SCID) of schizophrenia (36 M, Mean age 39.03)	COPE	Role Play Self-report Mood Scale GTS WAIS-R WMS-R BPRS	Patients reported higher maladaptive coping which correlated with negative affectivity No differences between groups on adaptive coping, which correlated with positive affectivity	++
14	Horan et al 2007	Longitudinal	If schizophrenia differ from other groups in response to a stressful life events.	96 outpatients with a DSM-III (SCID-III-R) diagnosis of schizophrenia (93% M, Mean age 43.6)	CRI	IES Earthquake Exposure Questionnaire RSES PSRS	Schizophrenia group had lower approach coping and approach and avoidance coping significantly correlated with IES-avoidance & self-esteem	++
15	Lysaker et al 2011	Cross-sectional	Whether schizophrenia patients' functioning associated with deficits in metacognitive factors	98 non-acute outpatients with DSM-IV diagnosis (SCID) of schizophrenia (65) or schizoaffective disorder (33) (83 M, Mean age 46.03)	MAS WCQ	MAQ SUMD MSEI WAIS III WMS III HVLTWCST)	Higher mastery more thinking & talking coping strategies Considering style used more by high mastery groups than other two groups	++
16	Lysaker et al 2003	Cross-sectional	Relationships between emotion responsivity, social cognition and functional outcomes in schizophrenia.	59 outpatients with DSM-IV diagnosis (SCID) of schizo-phrenia (40) or schizoaffective disorder (19) (57 M, Mean age 45)	WCQ	PANSS NEO	Problem solving and seeking social support used less by patients, who used more escape avoidance Use of escape avoidance, positive reappraisal and problem solving more likely to occur with high neuroticism	
17	Lysaker et al 2001	Cross-sectional	Relationship between hope, self-efficacy and well-being andmeasures	49 outpatients with DSM-IV (SCID) clinician confirmed	WCQ	CVLT WAIS-III WCST	Higher levels of escape-avoidance predicted higher levels of hope, self-efficacy and well-being	+

	Author(s) & Year	Design	Aims/Objectives	Sample Characteristics	Implicit measures of ER	Measures of Distress & Psychopathology	Summary of Results	Quality
			of neuro-cognition, symptoms and coping.	diagnoses of schizophrenia (33) or schizoaffective disorder (16) (47 M, Mean age 44).		AQ PANSS		
18	Pruessner et al 2011	Sample-control	Compare stress, symptoms and protective factors in ultra-high risk (UHR) psychosis group, first episode psychosis (FEP) group and healthy controls.	32 patients with DSM-IV-TR diagnosis of first episode (affective (10) & non-affective (22)) psychosis (FEP) (18 M, Mean age 22.72)	Brief COPE	TICS BPRS SERS MSPSS GAF	UHR used significantly less adaptive (active) coping skills than controls	++
19	Ritsner et al 2006	Sample-control	Identify coping patterns used by schizophrenia inpatients in comparison to those used by healthy controls.	237 inpatients with a DSM-IV diagnosis of schizophrenia (237); paranoid (176), residual (38), disorganised (11), undifferentiated (11), catatonic (1) (188 M, Mean age 37.9)	CISS	TBDI PANSS GSES RSES MPSS Q-LES-Q	Task avoidance coping used less by patients associated with emotional distress Emotion orientated coping was used more by patients No difference between groups found with avoidance-orientated coping	++
20	Strous et al 2005	Longitudinal	If there are differences in task-, avoidance-, and emotion-oriented coping strategies in schizophrenia patients over time	237 inpatients with clinician rated DSM-IV diagnosis of schizophrenia *N* = 237 (188 M, Mean age 37.9)	CISS	PANSS DSAS TBDI ITAQ GSES RSES MSPSS Q-LES-Q	Emotional distress explained more variance in emotion-related coping at exacerbation than stabilisation phase	++
21	Ventura et al 2004	Longitudinal	Do schizophrenia patients compare to controls in response to stressful life events.	29 stable outpatients with DSM-IV diagnosis (SCID-I) of recent-onset schizophrenia (22), schizoaffective (3), schizophreniform (3), or psychosis NOS (1) disorder (16 M, Mean age 25.8)	CRI	BPRS PERI-LE RSES & PSRS CALES DS-CPT SPAN CVLT	Approach coping used less by patients No difference in avoidance coping	++

Key: AQ = Attitude Questionnaire; BDI-II = Beck Depression Inventory Version 2; BHS = Beck Hopelessness Scale; BPRS = Brief Psychiatric Rating Scale; CALES = Cognitive Appraisal of Life Events Scale; CISS = Coping Inventory for Stressful Situations; COPE = Coping Orientations to Problems Experienced Scale; CRI = Coping Response Inventory; CVLT = California Verbal Learning Test; DDI = Drwal Delta Inventory; DSAS = Distress Scale for Adverse Symptoms; DS-CPT = Degraded-Stimulus Continuous Performance Test; EEQ = Earthquake Exposure Questionnaire ; GAF= Global Assessment of Functioning ; GSES = General Self-efficacy Scale; GTS = General Temperament Survey; HDS = Hamilton Depression Scale; HVLT = Hopkins Verbal Learning Test; IES= Impact of Events Scale ; ITAQ = Insight and Treatment Attitudes

Scale; MAS = Metacognitive Assessment Scale ; MAQ = Multidimensional Attitude Questionnaire; MPSS = Multidimensional Scale of Perceived Social Support; MSEI = The Multidimensional Self-esteem Inventory; NEO = Neo Five Factor Personality Inventory; PANSS = Positive and Negative Symptoms Scale; PERI-LE = Psychiatric Research Interview for Life Events; PSRS = Provision for Social Relations Scale; QLS = Quality of Life Scale; Q-LES-Q = Quality of Life Enjoyment and Satisfaction Questionnaire; RSES = Rosenberg Self-esteem Scale; SANS = The Scale for the Assessment of Negative Symptoms; SAPS = The Scale for the Assessment of Positive Symptoms; SERS = Self-esteem Rating Scale; SPAN = Span of Apprehension Task; STAI = State Trait Anxiety Inventory; SUMD = Scale to Assess Awareness of Mental Disorders; TBDI = The Talbieh Brief Distress Inventory; TICS = Trier Inventory for the Assessment of Chronic Stress; UMACL = UWIST Mood adjective Checklist; WAIS = Wechsler Adult Intelligence; WCQ = Ways of Coping Questionnaire; WCST = Wisconsin Card Sorting Task ; WMS = Weschler Memory Scale

5. Conclusion and Implications

5.1 Adaptive and maladaptive emotion regulation and coping

The consensus reached from the review is that efforts to regulate emotions, be they ER or coping strategies (Tables 3.1 & 3.2) will be associated with better or worse outcomes than others. A number of studies found that use of suppression was significantly correlated with decreased social functioning while reappraisal was associated with improved social functioning (Henry et al., 2008; Kimhy et al., 2012; Perry et al., 2011). Problem-focused and approach-orientated coping were also associated with better functional and social outcomes in psychosis. Given that social cognitive ability is a very important factor when predicting functional outcomes in psychosis (Fett, et al., 2011; van Os, et al, 2010.) and the fact that there have been calls to describe psychosis as a neurodevelopmental disorder with specific problems of social adaptation (Insel et al., 2010; van Os, et al., 2010), the regulation of emotion is clearly an important factor in psychosis.

One question remaining is whether ER and coping strategies are causal or whether they are simply reactions to greater distress and affectivity. The overall results suggest a causal role. Badcock et al (2011) found that the frequency, duration and loudness of voices increased with use of expressive suppression independent of negative emotions. Goldstone et al (2011) found that experiential avoidance mediated the level of delusions and delusional distress. Henry et al (2008) also found that suppression was associated with more symptoms of depression than in the psychosis group than in their control group. Unfortunately it is difficult to infer from the studies what the causal mechanisms are. Previous studies have highlighted how suppression is ineffective at down-regulating negative emotions because paradoxically it can increase physiological arousal related to negative emotion (Gross, 2002). Strategies like suppression can also drain cognitive resources (Gross, 2002; Mauss, Bunge, & Gross, 2007) reducing social functioning by inhibiting attention and memory (Barrett, Gross, Christensen, & Benvenuto, 2001; Hayes et al., 2004). Patients in general tended to have lower IQs than controls (Horan & Blanchard, 2003; Perry et al 2012), with one study (Horan & Blanchard, 2013) finding this specific to problems with logical memory. Ventura et al (2004) also showed that better sustained attention was associated with adaptive approach-orientated coping. Imagining the impact of deficit on patient functioning, avoidance strategies may then be more likely to

occur, further inhibiting positive behaviours like proactive coping (Roe et al., 2006). Such strategies offer the opportunity for positive self-development and more functional appraisals. This fits with the current review findings, especially those using the CRI (Ventura et al., 2006; Horan et al., 2007), which highlighted the relationship between approach-orientated strategies and higher self-esteem and self-efficacy. Both the processes of coping and ER highlight the interaction between cognitive appraisals, reactivity and attempts at regulation using wither external or internal means. In doing so, they also present clinical implications. Tackling maladaptive efforts to regulate emotion could have an accumulative effect. Aldao and Nolen-Hoeksema (2010) found that maladaptive emotion regulation strategies were significant predictors of psychopathology while adaptive strategies were not. Findings from the review suggest a reason for this. Shifting people away from maladaptive strategies could have a cumulative effect, freeing resources that could facilitate improved ER but also social functioning while increasing the opportunity for protective factors to develop (e.g.: improved self-efficacy and social support).

5.2 Emotion regulation and coping strategies compared

One caveat regarding the previous point is necessary. Coping strategies may not have as strong a causal relationship with clinical outcomes as ER strategies. Psychosis patients in general showed much greater use of emotion-focused coping than control groups but in response to stressful experiences. For example, Strous et al (2005) found that the presence of positive symptoms increased the likelihood of avoidance coping, but coping strategies changed as symptoms and distress reduced. They pointed out that key within the coping literature is that the level of emotional distress is the main predictor of coping style. This conclusion was echoed within two more studies reviewed (Gozdzik-Zelazny et al., 2011, Ritsner et al., 2006). Strous et al (2005) pointed out that it remains unclear whether coping styles are state rather than trait manifestations or trait responses to negative emotional states. Emotional states also interact with cognitions, in that as emotions escalate and signify distress, beliefs in the ability to change the situation or problem-solve may also change (Roe, et al., 2006). Lysaker et al (2011) highlighted this interaction nicely within their psychosis sample by employing a measure of mastery, a factor in metacognition (Gumley, 2011; Wells, 2000). Their study suggested that mastery was a possible mechanism that could explain why coping ability changed in response to changes in

psychological distress. Unfortunately this was one of the few attempts to assess within-group differences. Nonetheless, the key point here is that although both coping and ER processes appear to be transactional attempts to regulate emotion (Roe et al., 2006; Gross & Thompson, 2007), which is in keeping with the transactional nature of the stress-vulnerability model of psychosis (Phillips et al., 2011; van Os, et al., 2009), ER processes may be the more direct path to affecting outcomes. This path is arguably also more sensitive to subjective differences in distress, something not as easily accounted for when describing the broader definitions of coping strategies.

5.3 Different populations makes for different regulatory strategies

The previous point about difference in subjective levels of emotional distress is an important one. For example, Lysaker et al (2003) found that trait reactivity was higher in patients and this resulted in less appraisal and problem-solving. Perry et al (2012) also showed that patients had a lower tolerance for negative emotions and higher arousal and therefore were less likely to use acceptance. Even though it can increase or maintain emotional distress in the short term, acceptance is associated with better outcomes in the long term (Perry et al., 2011). However acceptance and other more adaptive strategies require a degree of emotional awareness or intelligence (Barlow et al., 2004; Gumley, 2011; Owens et al., 2012). Van der Meer et al (2009) explicitly measured this in their sample and found patients had poorer emotional awareness. Such difficulties were directly associated with insecure attachment patterns (Owens at al., 2012), again common in psychosis patients (Berry, Barrowclough, & Wearden, 2007; Liotti, Gumley, Moskowitz, Schafer, & Dorahy, 2008; Pickering, Simpson, & Bentall, 2008). Kimhy et al (2012) also found that suppression, more likely to be used by patients, was related to a poorer ability to correctly identify and label emotions. From a clinician perspective, if attempting to support a patient in the use of strategies like acceptance, it will be vital that their emotional awareness and tolerance be developed before the strategy will become useful to them in the face of their potentially greater emotional arousal (Docherty et al 2009; Kring et al., 2011).

Developing emotional awareness may also have further positive cumulative effects. A number of studies reviewed (Boschi et al., 2000; Horan & Blanhard, 2003; Horan et al., 2007; Livingston et al., 2009; Lysaker et al., 2003; Ritsner et al., 2006; Ventura et al., 2004) highlighted the tendency of psychosis populations to focus on strategies that employed greater internal focus to pick up on internal cues. Psychosis patients are also

more likely to over-manage such cues (Gumley, 2011). Indeed evidence of this was found in the current review, where Livingstone et al (2009) showed this using the REQ as patients used more internal dysfunctional strategies and less internal functional strategies than controls. Such approaches are detrimental to more adaptive externally focused strategies (Harvey et al., 2004). Getting patients to drop such approaches will again free up resources and allow an increase in functional ability.

5.4 Mixed results and methodological challenges

One of the recurring questions being investigated within the studies reviewed was whether there were differences between the ER and coping strategies used by psychosis patients compared to both normal and other clinical populations. Comparing findings, there is no clear answer yet reached. The majority of studies investigated whether there were differences between the use of suppression and reappraisal between psychosis populations and non-clinical samples. There were mixed findings as some studies found differences while others did not. There are several possible reasons for this confusion.

Firstly, the majority of studies did little to screen for within-sample differences. For example, Suslow et al (2003) found subgroups within their sample of psychosis patients who had distinctly different emotional profiles. They cleverly used this as a design within their study and found that different emotional profiles were associated with different ER strategies. For example, ER strategies did correlate with reduced positive emotional experiences such as joy. Likewise, Lysaker et al (2011) found that within their mixed psychosis sample schizoaffective patients were more likely to have a resigning ER style to emotional arousal and were found to pool at the intermediate level of mastery. This differentiated them from non-affective schizophrenia patients who tended to have lower mastery in metacognitive awareness. These factors influenced the coping strategy patients preferred. Different subgroups within psychosis samples have been found elsewhere, showing different emotional profiles (Holt et al., 2009; Strauss & Herbener, 2011). Especially in emotion research, it will be important to differentiate between within-sample differences and better control for likely confounding factors such as diagnosis. Secondly, demographic differences can also play a confounding role. Suslow et al (2003) found and interaction between gender and ER strategy. This supports other research showing that non-clinical male participants find emotional images more exciting than females (Kring et al 2011; Docherty et al., 2009). What is more significant however is that one of these

studies (Kring et al., 2011) found that the difference reversed in psychosis patients. Females began to show greater reactivity to emotional images compared to males. Lastly, the majority of the studies used samples of patients who were at different stages of illness, of different ages and on different medication. Pruessner et al (2011) for example suggested differences in their samples' emotional profiles could be attributed to medication. Given the already mentioned potential confounds that can affect choice of ER and coping strategies, there was reduced sensitivity within the studies to identify potentially significant findings. Failing to control for confounds when composing samples, as in the majority of studies reviewed here, will increase the likelihood of Type II errors and may be what is producing such mixed findings in regard to differences in ER and coping strategies.

A final point is the problem with the range of measures and definitions used across both the ER and coping studies. This makes the issue of collecting systematic data across the field difficult. For example, acceptance using one definition (Owens et al., 2012; Perry et al., 2011) is adaptive and functional but in another is maladaptive and dysfunctional (Ventura et al., 2004). Perry et al (2012) also found no correlations between the ERQ measure of suppression and EA, which is supposed to include suppression. Hence there are still problems related to the theoretical constructs that are being measured.

5.5 The need to understand context

The challenge in drawing inferences from both the coping and ER literature is knowing what internal and external resources are being used by participants to regulate emotion and with what goal they have in mind. Unfortunately most of the studies reviewed did not capture all the discrete processes likely to be involved in such behaviours. As has been noted elsewhere (Roe, et al., 2006) many studies still fail to closely assess or control for internal cognitive, motivational or emotional factors that can impact on regulatory strategies. These include individual variables such as attachment patterns (Berry, et al., 2006; Owens, et al., 2012), stigma from diagnosis (Birchwood, et al., 2000; Gilbert, 2010; Iqbal, et al., 2000; Turner, et al., 2013), history of early trauma (Jackson, et al., 2004; Mueser, et al., 2010; Mueser, Rosenberg, Goodman, & Trumbetta, 2002; Read, et al., 2001). This information provides a context which is necessary to fully understand ER. One way of incorporating context into resesarch on ER has been propsed by Aldao (2013), who has put forward a systematic approach to measuring the contextual factors relating to ER by specifying the components involved in the process (e.g.: organism carrying out the

regulation, the emotion-eliciting stimulus, the seletion and implementation of strategeis, the types of outcomes considered) and noting deviations within these components. Such a systematic approach to operationalizing context is needed before the evidence-base can develop further and different streams of literature on the subject of ER can be fully incorpoated. Despite these confounds however this review supports the idea that emotional regulation is an important clinical issue (Aldao et al., 2011) for psychosis samples.

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Appendix 1: Quality Review Tables

(Arcelus, et al., 2013; Gilbert, 2009)

Section 1: Internal Validity		**In this study the criterion is :**
1.1 The study addresses an appropriate and clearly focused question	Well covered	Not addressed
	Adequately covered	Not reported
	Poorly addressed	Not applicable
Selection of subjects		
1.2 Recruitment is appropriate to the aims of the research	Well covered	Not addressed
	Adequately covered	Not reported
	Poorly addressed	Not applicable
1.3 Representative cases from relevant population	Well covered	Not addressed
	Adequately covered	Not reported
	Poorly addressed	Not applicable
1.4 The study indicates how many people asked to take part did so	Well covered	Not addressed
	Adequately covered	Not reported
	Poorly addressed	Not applicable
1.5 Comparison is made between participants and non-participants to establish their similarities or differences	Well covered	Not addressed
	Adequately covered	Not reported
	Poorly addressed	Not applicable
1.6 Inclusion criteria made explicit and sample characteristics sufficiently described	Well covered	Not addressed
	Adequately covered	Not reported
	Poorly covered	Not applicable
1.7 Were subjects recruited over the same period of time?	Well covered	Not addressed
	Adequately covered	Not reported
	Poorly covered	Not applicable
Data collection		
1.8 Confidence in the quality of individual responses (e.g. telephone questionnaires might produce better quality answers than postal	Well covered	Not addressed
	Adequately covered	Not reported
	Poorly covered	Not applicable
1.9 Outcome is measured in an objective, standard, valid and reliable way	Well covered	Not addressed
	Adequately covered	Not reported
	Poorly covered	Not applicable
1.10 Reliance on current info rather than recall/hypothetical scenarios	Well covered	Not addressed
	Adequately covered	Not reported
	Poorly covered	Not applicable
Confounding		
1.11 The main potential confounders are identified and taken account in the design and analysis	Well covered	Not addressed
	Adequately covered	Not reported
	Poorly covered	Not applicable
1.12 Minimisation of bias- participant bias, observer bias, halo effects	Well covered	Not addressed
	Adequately covered	Not reported

	Poorly addressed	Not applicable
Statistical analysis		
1.13 Appropriate use of statistical analysis?		Appropriate
		Not appropriate
		Not clear
1.14 Actual p values reported (e.g. 0.037 rather than <0.05 for the main outcome, except when the p value is <0.001.		Yes
		No
Section 2		
2.1 How well does the study minimise the risk of bias or confounding, and meet its aims?		++
		+
		-
2.2 Taking into accent clinical durations, your evaluation of the methodology used and the statistical power of the study, are you certain that the findings could be replicated?		Yes
		No

The centrality of psychotic experiences: Impact on post-psychotic trauma, depression, and anxiety.

Word count: (10,813)

Abstract

Objectives: The newly developed concept of centrality has been found to correlate with symptoms of PTSD across a wide range of sample populations. The current study examined whether the centrality of psychotic experiences was correlated with post-psychotic trauma, depression and anxiety. The power of the concept of centrality to predict post-psychotic trauma, anxiety and depression was then compared to other known predictors such as levels of psychotic symptoms and post-illness cognitions.

Design: The study used a cross-sectional correlational design which examined the degree to which the concept of centrality was predictive of post-psychotic emotional dysfunction.

Method: Fifty individuals who met the criteria for psychotic disorder who were in remission from the acute phase of their illness completed measures of centrality of psychosis, post-psychotic emotional dysfunction (e.g., trauma, depression, and anxiety), psychotic symptoms, and post-illness cognitions in a semi-structured interview.

Results: Psychosis was found to be a highly central life event. However there was only a weak relationship between post-psychotic trauma and centrality. There was a stronger relationship between centrality of psychosis and depression. This relationship held even when controlling for post-psychotic appraisals. There was no relationship between the centrality of psychosis and anxiety. However, post-illness cognitions were predictive of trauma, depression, and anxiety.

Conclusions: The centrality of psychosis was shown to be related to post-psychotic trauma and depression but this relationship was found to be secondary to post-psychotic appraisals which were stronger predictors of post-psychotic trauma and depression. The results have implications for the concept of centrality and this issue is discussed further in the study.

Practitioner Points

- Significant life events such as psychosis can become central to daily inferences, personal identity and a marker for a turning point in life. Such an effect can

increase the risk of trauma and depression in the post-psychotic phase following the event.

1. Introduction

The word trauma originates from Greek and means “to wound”. Traumatic responses are thought to have a pathogenic or wounding effect by negatively impacting on the physical and psychological equilibrium of an individual (Dekel, Ein-Dor, & Solomon, 2012). A person diagnosed with a psychotic illness can be wounded by the illness through frightening hallucinations (Jackson, Knott, Skeate, & Birchwood, 2004; McGorry et al., 1991; Mueser, Lu, Rosenberg, & Wolfe, 2010), anxiety-provoking paranoid delusions (Freeman, 2007; Freeman & Fowler, 2009), shame about having a mental illness (Birchwood et al., 2007; Turner, Bernard, Birchwood, Jackson, & Jones, 2013), or experiencing loss or fracturing of personal identity (Estroff, 1989; Strauss & Herbener, 2011; Tarrier, Khan, Cater, & Picken, 2007). Additionally the forms of treatment for psychosis such as involuntary hospitalisation, use of restraint or involuntary medication can also lead to further distress and trauma (Frueh et al., 2005; Mueser, et al., 2010; Tarrier, et al., 2007). It is not altogether surprising that research has indicated one in three people will develop post-traumatic stress (PTSD) following psychosis (Buckley, Miller, Lehrer, & Castle, 2009), with psychosis patients four times more likely to develop PTSD symptoms than someone in the general population (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Trauma reactions such as PTSD are recognised by the presence of three clusters of symptom that include hyper-vigilance for threat and increased physiological arousal, re-experiencing of memories related to the traumatic event, and behavioural and cognitive avoidance of trauma related stimuli (APA, 2000). This traumatic reaction to either the amalgamation of events experienced during the psychotic illness or to one particularly distressing event during complicates the treatment of psychosis because trauma symptoms can exacerbate psychotic symptoms and inhibit engagement with treatment or services (Mueser & Rosenberg, 2003; Shaw, McFarlane, & Bookless, 1997). The clinical picture is also complicated by the similarity and overlap between symptoms of psychosis and symptoms of trauma (Bonanno, Brewin, Kaniasty, & Greca, 2010; Morrison, Frame, & Larkin, 2003), such as intrusive and automatic thoughts, images and somatic sensations, heightened anxiety and strategies of avoidance.

1.1 Psychosis as traumatising

Debate is on-going as to what makes for a traumatising event and whether experiences relating to psychosis qualify (Breslau, 2007; Mueser, et al., 2010; Rosen & Lilienfeld,

2008). For a diagnosis of PTSD to be received there is a requirement that the stressor (Criteria A) has to be gravely threatening and that trauma symptoms must relate to this stressor, which itself needs to meet specific criteria set out in diagnostic manuals (APA, 2000);

> The person has been exposed to a traumatic event in which both of the following are present: (1) the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others; (2) the person's response involved intense fear, helplessness, or horror. (pp. 427–428)

However, it has been shown that this distinction between actual or intra-psychic threat becomes clinically irrelevant if assessing degree of functioning, distress and symptomatology. Mueser et al (2010) examined a sample of recent onset psychosis patients for symptoms of trauma following their illness and found that their experience of psychotic symptoms and treatment commonly lead to symptoms of PTSD. Of the sample that reported symptoms of trauma, they divided them into participants reporting an event meeting DSM-IV criteria for a traumatic event (full PTSD) and those that did not (PTSD syndrome). They found that participants in the syndrome group were more distressed and functionally impaired than those meeting full PTSD criteria. This group also reported a more integrative style of recovery which suggested that despite them not meeting strict diagnostic criteria they were actively looking for help with their distress and symptoms. This is consistent with previous suggestions that the focus should be more on Post-Psychotic Post-traumatic Stress Disorder (Shaw, et al., 1997; White & Gumley, 2009; Williams-Keeler, Milliken, & Jones, 1994) or post-psychotic trauma symptoms (Jackson et al., 2009; White & Gumley, 2009), recognising that events surrounding a psychotic illness can be so physically or psychologically threatening they can traumatise (Holmes, Grey, & Young, 2005; Mueser, et al., 2010; Steel, Mahmood, & Holmes, 2008). From 425 patients in ten studies that have examined post psychotic post-traumatic stress disorder (PP-PTSD) in first-episode psychosis (FEP) and relapsing psychosis patients (McGorry et al., 1991; Priebe et al., 1998; Meyer et al., 1999; Morrison et al., 1999; Shaw et al., 1997, 2002; Kennedy et al., 2002; Jackson et al., 2004; Harrison and Fowler, 2004; Chisholm et al., 2006; Frame & Morrison, 2001; Morrison et al 2001), White and Gumley (2009) estimated that the prevalence rate for PP-PTSD was 41.9%. Although conservative when compared to some reported figures (Mueser, et al., 2010; Rosenberg et al., 2000), it is still double the expected rate of PTSD if examining non-clinical populations. Understanding how trauma

and symptoms of psychosis interact must become a priority if one hopes to effectively assess and treat the distress and symptoms within a psychosis population (Mueser et al., 2010).

1.2 Mediators of traumatic responses and emotional dysfunction

The impact of traumatic events on individual's psychological wellbeing is evidenced by emotional dysfunction and impaired functioning (Bonanno & Mancini, 2012; Mueser, et al., 2010). Anxiety is a key part of PTSD, with people experiencing a persistent sense of threat (Ehlers & Clark, 2000; Kar & Bastia, 2006; Weems et al., 2007). Depression in often a reaction to trauma (Foa, Gillihan, & Bryant, 2013) and has been posited to play a causal role in the development of trauma (Bryant, Salmon, Sinclair, & Davidson, 2007). Birchwood, Iqbal and Trower (2000) reported that 36% of their psychosis patients developed moderate to severe depressive symptoms within a year of the acute psychotic phase with Yung & McGorry (1996) reporting that 68% of people in the prodromal phase of the illness experienced symptoms of depression and anxiety. These figures highlight that trauma and emotional dysfunction are closely related and that the relationship between them needs to be better understood (Breslau & Kessler, 2001; McGorry, et al., 1991; Morrison, et al., 2003), with both potentially sharing aetiological factors (Birchwood, 2003; Breslau, 2007).

As the figures show, not everyone experiences prolonged traumatic reaction such as PTSD after traumatic events, as roughly 80% will be without symptoms of trauma after (Bonanno, et al., 2010). There are recognised differences in traumatic responses according to gender (Tolin & Foa, 2008), with one large study showing that 20% of women compared to 8% of men suffered from PTSD following a traumatic event (Kessler et al., 1995; Kessler, et al., 2005). Others have also found differences across ages (Banks & Salmon, 2012; Berntsen & Thomsen, 2005; Gerber, Boals, & Schuettler, 2011; Meyerson, Grant, Carter, & Kilmer, 2011). Also the type of trauma can affect risk of post-traumatic response (Su & Chen, 2008). Researchers have sought to define the factors that might inoculate against or help resolve trauma. One area that has received much interest is how people relate events to the self and whether they see events having a positive or negative impact on their self or future (Beck, Coffey, Paylo, Gudmundsdottir, & Miller, 2004; Daie-Gabai, Aderka, Allon-Schindel, Foa, & Gilboa-Schechtman, 2011; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999). It has been suggested that this process can be dimensional in

structure as individuals' responses can be placed on a continuum from resilient to severe traumatic distress (Bonanno, et al., 2010; Broman-Fulks et al., 2010), with concepts such as resilience (Bonanno, et al., 2010; Brown, Kallivayalil, Mendelsohn, & Harvey, 2012; Seery, 2011), post-traumatic growth (Boals & Schuettler, 2010; Bonanno & Mancini, 2013; Waters, Shallcross, & Fivush. 2012), distress tolerance (Leyro, Zvolensky, & Bernstein, 2010; Zvolensky, Vujanovic, Bernstein, & Leyro, 2010), buffering (Johnson, Wood, Gooding, Taylor, & Tarrier, 2011) and recovery (Bonanno & Mancini, 2013) being used to understand the process by which individuals can relate to events. Predicting who is likely to be resilient or need additional support is a difficult challenge, especially as age, gender and other demographic variables can make a difference (Bonanno, et al., 2010). This is also the case within psychosis populations. Specific mediators of trauma following psychosis include a history of previous traumatic life events (Mueser, Rosenberg, Goodman, & Trumbetta, 2002) including childhood abuse (Morgan & Fisher, 2007), the degree and quality of social support (Beattie, Shannon, Kavanagh, & Mulholland, 2009; Chisholm, Freeman, & Cooke, 2006), appraisals of illness (Birchwood & Trower, 2006; Jackson, et al., 2004), fear of relapse (White & Gumley, 2009), levels of control or feelings of helplessness (Brunet, Birchwood, Upthegrove, Michail, & Ross, 2012; Chisholm, et al., 2006), shame (Turner, et al., 2012), depression (Beattie, et al., 2009) and anxiety (Jackson, et al., 2004). However, one potential mediator of trauma following psychosis which does not appear to have been examined is the concept of centrality.

1.3 The centrality of events as a predictor of trauma

Bernsten and Rubin (2006, 2007) developed the concept of centrality and the Centrality of Events Scale (CES) to measure it. The CES is made up of three overlapping factors identified from within memory research, i) the degree to which an event becomes a reference point for an individual's everyday inferences, ii) how influential an event is to an individual's construction of personal identity, iii) and how much an event marks a turning point in the individual's life story. The CES has been described as measuring a turning point in an individual's life that directly impacts upon their personal identity (Gauer, Souza, Silveira, & Sediyama, 2013) or the degree to which events they have experienced have been integrated into their memory which then act as a reference point for their future expectations (Robinaugh & McNally, 2011).

In the original studies with undergraduates, higher CES scores have been associated with likelihood of PTSD symptoms and more severe emotional dysfunction following a negative event (Berntsen & Rubin, 2006; Berntsen & Rubin, 2007). This has been so even when controlling for depression and self-esteem, age, IQ and dissociation (Robinaugh & McNally, 2011). Recent research has found that CES scores can predict PTSD in a range of samples, including war veterans (Brown, Antonius, Kramer, Root, & Hirst, 2010), following grief (Boelen, 2009, 2012) older adults (Berntsen, Rubin, & Siegler, 2011; Ogle et al., 2013), and victims of child abuse (Robinaugh & McNally, 2011). The majority of these studies have found significant correlations between scores on centrality and symptoms of PTSD with the strength of the correlations ranging from small (r = .35) (Berntsen & Rubin, 2006) to large associations (r = .69) (Robinaugh & McNally, 2011). This provides support for the original work showing higher scores on measures of centrality results in higher levels of trauma symptoms. Centrality has also been used to differentiate between different types of emotional responses to traumatic events. For example, shame memories have been shown to have traumatic memory characteristics because they tend to involuntarily intrude into consciousness (Matos & Pinto-Gouveia, 2010). Whether these memories are central or not predicts ensuing psychopathology following traumatic events (Pinto-Gouveia & Matos, 2011), including paranoid ideation and levels of dissociation (Matos, Pinto-Gouveia, & Duarte, 2012). The CES has also been applied to studies examining the centrality of chronic pain, with high CES scores being predictive of higher reported subjective pain, disruption to life and psychological distress from pain (Perri & Keefe, 2008). The concept of centrality has also been shown to be predictive of complicated grief (Boelen, 2009) and prolonged grief and emotional dysfunction following bereavement (Boelen, 2009, 2012). Thus, CES appears to be related to PTSD in a range of samples.

1.4 Models of post-traumatic reactions

This concept of centrality has raised further debate however. There have been a number of theoretical models proposed in order to explain traumatic reactions and PTSD especially. Some models have focused on fear conditioning (Leskin, Kaloupek, & Keane, 1998; Mowrer, 1960), some on cognitive factors such as schemas (Janoff-Bulman, 2010), memory (Brewin, Dalgleish, & Joseph, 1996; Dalgleish, 2004; Foa, et al., 2013; Rubin, Berntsen, & Bohni, 2008), or post-event appraisals and rumination (Ehlers & Clark, 2000;

Kleim, Ehlers, & Glucksman, 2007). In recent years the most dominant model has been proposed by Ehlers & Clarke (2000), which suggested that PTSD was maintained by an on-going current sense of threat which was the result of an interaction between post-traumatic appraisals, memory of the trauma event, and maladaptive coping strategies. Negative appraisals about how an individual acted during the event, aspects of the event itself or about responses following the event interact to maintain anxiety. Additionally, due to the effects of stress at the time of the trauma, memories of the event can be fragmented. This is because traumatic events are thought to be encoded via sensory-driven processing systems only, which allows little contextual detail about time and place or integration with previous and autobiographical memories to be stored alongside. Trauma memories are then easily triggered by any associated details with the traumatic event (Ehlers & Clark, 2000), with little voluntarily control or understanding possible (Brewin, et al., 1996; Brewin, Gregory, Lipton, & Burgess; Ehlers & Clark, 2000). Avoidance behaviours then become a means of managing these intrusive experiences but they further limit opportunities to integrate the events so that involuntary triggering of trauma memories continue and a sense of threat is maintained

Centrality and the theory around it (Berntsen, Willert, & Rubin, 2003) questions some of these premises put forward within the Ehlers and Clarke's model. Both models are in agreement that PTSD is maintained by a sense of current threat which leads to altered perceptions and appraisals of the self, world and others. But centrality suggests that current threat is maintained by trauma memories being over-integrated into memory architecture rather than poorly integrated. Berntsen et al (2011) suggest that after the trauma even innocuous new memories become associated with traumatic memories, with the latter acting as "landmarks" for new experiences. Regardless, models of traumatic reactions are in agreement that appraisals of the self as vulnerable and the world and others as threatening maintain a sense of current threat. The debate exists about whether trauma memories are fragmented and implicit or whether they are vivid and detailed (Brewin, 2007; Lancaster, Rodriguez, & Weston, 2011). This relates to theories suggesting either an over-integrated, centralised memory or a poorly integrated, contextually vague memory (Berntsen, 2001; Berntsen, et al., 2011; Dalgleish, 2004; Lancaster, et al., 2011).

1.5 Which models best explain differences in post-traumatic responses and recovery

In an attempt to understand this complex set of findings, Lancaster, Rodriquez & Weston (2011) conducted a path analysis comparing the predictive ability of the Ehlers & Clarke (2000) model of post-traumatic reactions (the importance of appraisals and the under-integration of trauma memories) and the model proposed by Berntsen et al (2003) (over-integration of a trauma memories). The results indicated an interaction between centrality, post-traumatic appraisals and symptom severity. They concluded that events appraised as having high centrality, were likely to receive negative appraisals in relation to how the event affected views of self, world and others, which maintained a sense of current threat. From their findings they suggested a primary role for post-traumatic appraisals in the development of trauma and emotional dysfunction following an event (Berntsen & Rubin, 2006; Brewin, et al., 1996; Foa, et al., 2013), but suggested that centrality mediated which events would receive such appraisals (Berntsen & Rubin, 2007; Boals, Steward, & Schuettler, 2010; Brown, et al., 2010). However, their data did not clarify which model most accurately described the memory processes implicated in traumatic reactions as their data was unable to provide insights about the over-integration or under-integration of traumatic events into memory.

1.6 The current study

To our knowledge no studies have yet investigated the relationship between the centrality of a psychotic experiences and post-psychotic trauma and emotional dysfunction. A sample of first-episode psychosis patients were selected for the study. It was felt that using a first-episode sample would reduce the possibility of confounding variables possible within a sample of patients with chronic psychosis. Examples of potential confounds in such a population could include the variability of episodes or prolonged use of older forms of anti-psychotic medication which could be avoided by using a first-episode sample.

- The first hypotheses examined the relationship between centrality and post-psychotic trauma symptoms. Given the global impact of psychosis (Rooke & Birchwood, 1993; Birchwood, 2006), the high levels of trauma within this population (Morrison, et al., 2003) and previous research findings considered above showing links between centrality and trauma across a range of different sample populations (Berntsen & Rubin 2007; Boals, 2010; Boelen, 2009) we were

expecting to find a positive correlation between the centrality of psychotic experiences and post-psychotic trauma symptoms.

- The second hypothesis examined whether there would be a relationship between the centrality of psychotic experiences and depression and anxiety following psychosis. In light of previous findings already discussed showing higher centrality scores to be associated with increased depression across a range of samples (Boals & Schuettler, 2010; Brown, et al., 2010; Rubin, Boals, & Berntsen, 2008), we were also expecting to find a positive correlation between the centrality of psychotic experiences and depression. Despite one study failing to find a correlation (Newby & Moulds, 2011), the majority have found such a relationship (e.g., Bernsten & Rubin, 2007; Boals et al., 2012).
- The third hypothesis examined whether the relationship between centrality and post-psychotic trauma (if indeed one exists) held up when controlling for the role of event-related appraisals, which have been advocated as primary predictors of post-traumatic reactions (Brown, Buckner, & Hirst, 2011; Ehlers & Clark, 2000). Centrality may share predicted variance with other known predictors of traumatic responses such as event-related (e.g.: complex grief) appraisals (Boelen, 2009; Lancaster, et al., 2011). When factored in together, the utility of centrality when predicting post-event depression and PTSD has reduced alongside these event-related appraisals (Boelen, 2009). Furthermore, Brown, Buckner & Hirst (2011) have also shown that war veteran's event-related appraisals predicted levels of PTSD without needing to include centrality as a factor. In their sample of depressed non-traumatised patients, Newby & Moulds (2011) found that centrality was not correlated with depression but rather the characteristics of memory such as intrusiveness and vividness of depressive memories as well as rumination about depressing events. In regard to emotional dysfunction following traumatic events, Matos Pinto-Gouveia and Duarte (2012) found that despite sadness being higher in centrality compared to shame, the combined effect of centrality and the characteristics of shame memories predicted psychopathology (Matos, et al., 2012). As discussed above, appraisals have been implicated in the maintenance of a current sense of threat which is at the core of post-traumatic reactions (Ehlers & Clark, 2000; Foa, et al., 2013) In particular, negative appraisals about oneself and the world, which are often assessed with the Post- Traumatic Trauma Cognitions

Inventory (PTCI) have been implicated in PTSD (Beck, et al., 2004). Therefore, we included the PTCI to assess appraisals of self, world, and self-blame However, we were also interested in assessing psychosis specific appraisals given that research above has found that event-specific appraisals such as for complex grief (Boelen, 2010) and war (Brown, et al., 2010) have been more predictive of trauma than centrality. Previous studies with psychosis populations using psychosis specific measures such as Personal Beliefs about Illness Questionnaire (PBIQ) (Rooke & Birchwood, 1998) and the Fear of Re-occurrence Scale (White & Gumely, 2009) have found that appraisals of lost social status, roles or valued goals (Birchwood, et al., 2007), self-blame (Birchwood et al., 2000; Gumley et al., 2006), entrapment, humiliation and shame related to illness (Gumley, et al., 2006; Rooke & Birchwood, 1998) and threat from a psychotic relapse (Gumley & Schwannauer, 2006; Jackson, et al., 2004; White & Gumley, 2009) have been associated with both post-psychotic trauma and emotional dysfunction such as depression and anxiety Therefore, we included both the PBIQ and the FoRSE to see whether centrality is necessary or sufficient in predictions of post-psychotic trauma in the presence of specific psychosis related appraisals.

- Our fourth and fifth hypothesis examined the same issues but focused instead on depression and anxiety.
- Finally, given that the Centrality of Events Scale is a relatively new measure and has provoked debate over its relationship to appraisals and distress, we also explored the relationship between centrality and other appraisal variables to see whether the CES subscales correlated with subscales from measures of appraisal used within first-episode psychosis populations.

2. Method

2.1 Design and Procedure

Ethical approval was first obtained from the National Research Ethics Service (Appendix 2). Case mangers across five teams comprising Birmingham Solihull Mental Health Trust (BSMHFT) Early Intervention Services (EIS) were then presented with a description of the study and asked to identify appropriate patients for participation. Care coordinators, namely community mental health nurses managing the participants care, then either discussed the study with their patients independently or authorised researchers to contact the patient to see whether they were interested in participating. Agreement to participate led to face-to-face semi-structured interviews with either the main author or with an MSc psychology research assistant who had ethical approval and was being supervised by a qualified clinical psychologist throughout. Interviews lasted on average 60 minute with the ange being between 30 to 120 minutes. Forty four per cent (22/50) of the interviews were carried out by the main author while 56% (28/50) were carried out by the MSc research assistant. All initial meetings provided the patient with an Information Sheet to facilitate informed consent (see Appendix 3) and time to consider participation and ask questions. Patients wishing to participate signed the Consent Form (see Appendix 4) and completed the measures with either researcher present either at the patient's home or at a venue of their choosing. Participants were able to request assistance with reading and writing if language or comprehension was an issue.

2.2 Participants

A total of 50 participants were recruited across five EIS Teams in Birmingham and Solihull. Ages of participants ranged from 17 to 36 years, with the mean age being 25 years. There was a broad mix of ethnicity, sex (35 male) and economic background that included White British/Irish (40%), Asian (30%), Afro-Caribbean (18%) Chinese (2%), and mixed race (8%) (see Appendix 1). Inclusion for the study required a diagnosis of psychosis as defined by the International Classification of Mental and Behavioural Disorders 10th Revision (WHO, 1993). Diagnosis was supplied by the treating clinicians and included psychosis not otherwise specified (48%), schizophrenia (26%), schizoaffective (6%), and bipolar disorder (20%). All participants had therefore experienced a psychotic episode which met criteria for first-episode psychosis within the last three years but were within a stable phase of their illness. The latter criteria was

defined by their care coordinators as a period where distress from psychotic symptoms was minimal, risk of harm to self and others was minimal and patients were not in an acute phase of their illness. Where these criteria were not met, participants were excluded from participating. All participation was completed within a nine month period during which participants did not pose a risk to themselves or others and had not been an inpatient during the time of the study. Those choosing not to participate were not asked for reasons why and nor was demographic information gathered about them due to lack of informed consent. Attrition rates were very low with only two participants (4%) lost during interview.

2.3 Measures (see Appendix 5)

2.1.1. Measuring the centrality of psychotic experiences

The Centrality of Events Scale (CES; Berntsen & Rubin, 2006): The CES is a 20 item self-report questionnaire designed to measure the extent to which an event becomes a reference point for everyday inferences ("This event has become a reference point for the way I understand myself and the world"), a turning point in a person's life story ("This event permanently changed my life") and personal identity ("I feel this event has become part of my identity"). Items are rated on a 5-point scale ranging from 0 (totally disagree) to 4 (totally agree). Higher scores on the CES have been shown to be predictive of post-traumatic stress disorder (Berntsen & Rubin, 2007), traumatic responses following war (Brown, et al., 2010), emotional dysfunction following loss (Boelen, 2009), likelihood of experiencing shame (Pinto-Gouveia & Matos, 2011) and psychological distress related to persistent pain (Perri & Keefe, 2008). In this study the event in question was the person's experience of their psychotic illness as a whole. Overall the CES has been shown to have excellent validity and reliability ($\alpha = .88$) (Berntsen & Rubin, 2006). In the current study the CES had good internal reliability ($\alpha = .84$).

2.1.2 Measures of Trauma

The Impact of Events Scale-Revised (Weiss, 2007): The 22-item measure of PTSD symptoms includes three factors that correspond to the DSM-IV (APA, 2000) diagnostic symptom criteria for PTSD, intrusions (7 items); avoidance (8 items) and hyper-arousal (6 items). Building on the earlier scale designed by Horowitz et al (1979) which did not

include a measure of hyper-arousal, the IES-R is designed to be indicative not diagnostic for PTSD. Participants are asked to indicate on a 5-point scale ranging from 0 (not at all) to 4 (extremely) indicating whether they experienced symptoms representative of the three clusters within the last week in relation to their psychosis. A total score along with scores corresponding to the three symptoms clusters are compared, with higher scores indicating likelihood of PTSD presentation. Scores above 45.75 on the IES-R have been shown to be reliable indicators of PTSD in studies of First Episode Psychosis (Brunet, et al., 2012). The IES-R has been widely used in research which has shown it to have good validity and reliability (Weiss, 2007). In the current study the internal reliability across subscales (intrusions, α = .86; hyper-arousal, α = .83; avoidance, α = .80) and overall total (α = .93) was good to excellent.

2.1.3. Measures of Depression and Anxiety

The Beck Depression Inventory - II (Beck, 1996): The BDI-II is a common self-report measure design to indicate levels of depression. Responders rate on a four-point scale how often they have experienced 21 symptoms of depression – somatic and emotional - over the last two weeks. Responses are added together to give a total score that can be compared to cut-offs indicative of the level of depression; 0-13 is considered minimal, 14-19 is mild; 20-28 is moderate and 29 or above severe (Beck, 1996).The measure has reported internal reliability rates with Cronbach's alpha of .91 (Dozois, Dobson, & Ahnberg, 1998). In the current study, internal reliability was excellent (*α* = .95).

The Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1998): The BAI is a 21-item self-report measure of anxiety designed to distinguish between physiological, behavioural and cognitive symptoms specific to anxiety that are independent of depression. All items are rated according to the past week. A total score is computed from all items and compared to cut-offs indicative of the level of anxiety; 0-7 is minimal, 8-15 is mild; 16-25 is moderate and 26-63 is severe. The measures has been shown to have high test-retest reliability (*r = .75)* and excellent internal consistency (α = .92) (Beck, et al., 1988). In the current study, internal reliability was also excellent (α = .93).

2.1.4 Measures of Appraisals of Psychotic Experiences

Post-traumatic Cognitions Inventory (Foa, et al., 1999): The PTCI is a 33-item self-report scale that is designed to specifically assess trauma-related thoughts and beliefs.

It uses a 7-point Likert scale to examine three different factors, which are i) negative cognitions about the self (21 items), ii) negative cognitions about the world (7 items), and iii) cognitions indicating self-blame (5 items). The PTCI has been reliably associated with both PTSD and depression following traumatic events (Foa, et al., 1999) and has very good internal consistency (Daie-Gabai, et al., 2011). Internal reliability in the current study was good for the overall scale (α = .96) and subscales (α = .95, negative self-view; α = .90, negative world view; self-blame, α = .78).

Fear of Recurrence Scale (Gumley & Schwannauer, 2006): The FoRSE is a self-report 23-item scale, which uses a 4-point Likert scale to assess fears of experiencing a relapse of psychosis. The items are clustered into three factors that includes i) fear of relapse (7 items), ii) awareness of symptoms (9 items), and iii) intrusiveness of thoughts (7 items). A total score can be gathered from the sub-scales, with higher scores indicating greater fear of relapse. The measures have been shown to have good to excellent internal reliability and validity (Gumley & Schwannauer, 2006). The current study showed the measure to have good to excellent internal reliability across subscales (α = .85, fear of relapse; α = .91, intrusions; awareness, α = .89) and overall total (α = .92).

Personal Beliefs about Illness Questionnaire-Revised (Birchwood, Jackson, Brunet, Holden, & Barton, 2012): The PBIQ-R is a 20-item self-report measure of appraisals associated with psychosis. Participants respond, on a 4-point Likert scale ranging from 1 (disagree) to 4 (agreed) to indicate their agreement with items assessing five constructs including i) shame (e.g.: I am embarrassed because of my illness), ii) loss (e.g.: My illness stops me doing things I want to do), iii) entrapment (e.g.: I feel trapped by my illness), iv) control over illness (e.g.: I am intimidated by my illness), and v) social marginalization (e.g.: I feel excluded because of my illness). The PBIQ-R based on the earlier PBIQ (Birchwood, Mason, MacMillan, & Healy, 1993), which has been since used to examine emotional dysfunction, including anxiety and trauma following psychosis (Birchwood, et al., 2000; Tarrier, et al., 2007). The PBIQ-R has been adapted to fit more concisely to social rank theory (Birchwood, et al., 2012) in order to improve its sensitivity when assessing post-psychotic psychological adjustment and to improve its predictive ability in regard to depression following psychosis. The measure is not designed to provide a total score but rather a score relating to each of the five appraisals. Higher scores mean less shame, loss, entrapment, control, and social marginalisation. It has acceptable internal reliability and validity (Birchwood, et al., 2012), with the current study showing similar

internal consistency (α = .75, shame; α = .72, control; α = .73, loss; α = .68, entrapment; social marginalisation, α = .75).

2.1.5 Measures of Psychosis

Psychotic Symptoms Rating Scale (Haddock, McCarron, Tarrier, & Faragher, 1999): The PSYRATS is a semi-structured interviewer-administered scale developed to examine auditory hallucinations and delusions. Eleven items assess three factors associated with auditory hallucinations, i) distress and negative content (emotional factor), ii) frequency and duration (physical characteristics factor) and iii) beliefs about the reality, location, control and life disruption affiliated with the voices (cognitive interpretation factor). Six items assess two factors related to delusions, i) duration, conviction and disruption to life (cognitive interpretation factor) and ii) the intensity of distress associated with the delusions (emotional factor). Each item is scored on a 5-point scale ranging from 0 (no problem) to 4 (maximum severity). The measure requires the interviewer to first elicit psychotic symptoms in order to rate the characteristics of the symptoms. If no symptoms have been present over the last week the score is zero. An overall total allows an indication of the subjective experience and characteristics of both hallucinations and delusions. The PSYRATS has been shown to be a reliable and valid measure for a first-episode psychosis population (Drake, Haddock, Tarrier, Bentall, & Lewis, 2007) and for assessing the characteristics of psychotic symptoms (Haddock, et al., 1999; Steel, et al., 2007). Internal consistency for the PSYRATS in the current study was excellent for the overall scale (α = .97) and for the hallucinations (α = .97) and delusions (α = .96) subscales.

3. Results

In this section, the mean scores from Centrality of Event Scale (CES) from the current sample will be considered and then compared with CES scores from other samples in order to highlight how central our sample is rating psychosis relative to other stressful life events. Descriptive statistics for the other measures will then be presented. Correlation analyses followed by regression analyses will then be used to test each of the hypotheses.

3.1 CES means across studies and in the current study

Mean scores and standard deviations from studies using the CES to investigate centrality are shown in Table 3.1. It can be seen that the overall current sample mean of 69.88 (*SD = 15.06*)[5] indicates that participants reported experiencing their psychotic illness as having high centrality as the top score on the CES is 96. Compared to other studies, which have examined centrality across various populations, the mean CES score is one of the highest reported (see Table 3.1 for a summary). The total centrality score for our psychosis sample is higher than centrality scores for a range of samples including pain (Perri & Keefe, 2008), war veterans (Brown et al. 2010), survivors of childhood sexual abuse (Robinaugh & McNally, 2010), depression (Newby & Moulds, 2011), and comparable with the original studies by Bersten & Rubin (2006; 2007) when they first assessed centrality of traumatic memories in student samples.

[5] The 20-item short form version of the CES was reported but due to the greater number of studies using the 7-item version we also record here its mean, 3.57 (.51).

Table 3.1 A display of means and standard deviations across studies using the CES

Study	Life Event	Centrality of Event Score	
		Short	Long
		M (SD)	M (SD)
Current Study	*Psychosis*	*3.57 (.85)*	*69.88 (15.06)*
Berntsen & Rubin (2006)	Trauma	3.56 (.80)	_
Berntsen & Rubin (2007)	Trauma	3.56 (1.07)	_
Rubin Boals & Berntsen (2008)	Trauma:		_
	-high	3.95 (.73)	
	-low	2.83 (.76)	
Perri & Keefe (2008)	Chronic Pain	_	68.9 (17.4)
Brown et al (2010)	Trauma	3.02 (1.49)	_
Smeets et al (2010)	Trauma	2.32 (1.0)	_
Boals & Schuettler (2010)	Trauma	2.56 (1.26)	_
Berntsen Rubin & Seigler (2011)	Life course:		_
	-positive event	3.98 (1.03)	
	-negative event	2.44 (1.23)	
Robinaugh & McNally (2011)	Child abuse/ trauma	3.48 (NA)	_
Newby & Moulds (2011)	Depression		_
	-depressed	2.78 (1.08)	
	-recovered	2.97 (1.03)	
	-non-depressed	2.37 (1.19)	
Banks & Salmon (2012)	Youth & trauma	3.97 (.53)	_
Gauer et al (2013)	Trauma	_	57.6 (19.83)
Ogle et al (2013)	Life course		_
	-highest (illness)	3.20 (1.19)	
	-lowest (stalked)	1.57 (.73)	

3.2 Descriptive Statistics

Means (*M*) and standard deviations (*SD*'s) for all measures are shown in Table 3.2 below. The mean level of trauma as indicated on the IES-R (*M* = 33.82; SD = 21.51) is above the traditional cut off (scores < 33; Creamer, et al., 2003) for meeting a diagnosis of PTSD. In addition, based on a more recent classification of trauma within a first-episode psychosis population (Brunet, et al., 2012), 36% of the sample could be considered to meet the criteria for PTSD in relation to their psychotic illness. Scores on the BDI-II indicates that the sample (*M* = 15.20 (*SD* = 12.89) fell within the mild range for depression (BDI-II = 14-19) (Beck, et al., 1998). However, using established criteria for post-psychotic depression (scores within the moderate range (BDI-II = >20) (Birchwood, et al., 2000; Turner, et al., 2013), 28% of the current sample were experiencing symptoms of post-psychotic depression. Scores on the BAI (*M* = 12.92; SD = 11.16) indicate the sample fell within the mild range for anxiety. Finally, only 33% of participants reported active psychotic symptoms. Furthermore, the means indicated low levels of hallucinations (*M* = 5.90; *SD* = 11.50), delusions (*M* = 2.36; *SD* = 5.40), and overall psychosis (*M* = 8.26; *SD* = 15.21). There were no relationships detected between demographic variables including any variance in participant characteristic according to research site, diagnostic criteria and target variables (all *p's* > .05) (see Appendix 1 for means and percentages).

Table 3.2 Descriptive statistics for measures used in current study

MEASURES	RANGE	MEAN	SD
CES Total	21-96	69.88	15.06
-Inferences	9-40	27.46	6.38
-Personal Identity	7-35	24.54	5.86
-Turning Point	5-25	17.88	4.47
IES-R Total	0-88	33.82	21.51
-Intrusions	0-31	11.60	8.66
-Avoidance	0-32	13.78	8.14
-Hyperarousal	0-24	8.44	6.80
BDI-II Total	0-53	15.20	12.89
BAI Total	0-44	12.92	11.61
PSYRATS Total	0-58	8.26	15.21
PSYRATS Hallucinations	0-36	5.90	11.50
PSYRATS Delusions	0-22	2.36	5.40
PTCI Total	33-181	95.76	41.29
-Negative Views of Self	21-110	56.28	27.36
-Negative Views of World	7-47	24.48	11.73
-Self Blame	5-28	15.34	7.20
PBIQ-R			
-Shame	5-16	11.06	2.83
-Control	7-16	11.58	2.65
-Loss	6-16	11.54	2.75
-Entrapment	4-16	11.80	3.07
-Social Marginalisation	7-16	12.18	2.58
FoRSE Total	0-81	51.60	17.20
-Fear of Relapse	7-28	14.96	5.80
-Intrusions	7-28	14.70	6.73
-Awareness	9-36	22.52	7.17

Key: CES = Centrality of Events Scale; IES-R = Impact of Events Scale Revised (higher scores mean more trauma symptoms); BDI-II = Beck Depression Inventory Second Edition; BAI = Beck Anxiety Inventory; PSYRATS = Psychotic Symptoms Rating Scale; PTCI = Post-traumatic Cognitions Inventory; PBIQ-R = Personal Beliefs About Illness Questionnaire Revised; FoRSE = Fear of Recurrence Sca

3.2 Correlations between centrality and trauma in psychosis

The first correlation analysis examined whether higher scores on the CES correlated with greater number of trauma symptoms following psychosis. From Table 3.3 it can be seen

that total CES scores did not significantly correlate with total IES-R scores (r = .25, p = .078). However, CES-turning point was significantly correlated with total IES-R (r = .31, p = .027), IES-intrusions (r = .38, p = .006), and IES-R avoidance (r = .31, p = .028). Thus, participants who scored higher on CES-turning point also reported more intrusions and avoidance behaviours. Finally, CES- personal identity was significantly correlated with IES- avoidance (r = .28, p = .05). Thus, participants scoring higher scores on CES personal identity reported more avoidance behaviours in response to their psychosis. Therefore, the first hypothesis was only partly supported as participants who overall rated their psychotic episode as high in centrality did not report significantly more post-psychotic trauma symptoms. However, subscales within the CES showed significant associations with symptoms of traumatisation following psychosis.

3.3 Correlations between centrality and depression

Correlation analysis then explored whether the centrality of a psychotic illness was associated with the degree of depression experienced after psychosis. From Table 3.3, it can be seen that depression as measured by the BDI-II correlated significantly with Total CES (r = .44, p = .001), CES, inferences, (r = .37, p = .008), CES personal identity (r = .45, p = .001), and CES-turning point in life r = .37, p = .008). Thus, participants who reported that they used their psychosis as a reference point for everyday inferences, believed that their psychosis has impacted upon their personal identify, and that the illness was a turning point in their lives also were more depressed. This data supported the second hypothesis.

3.4 Correlations between centrality and anxiety

The third hypothesis examined whether there was a relationship between centrality of psychosis and anxiety. As can be seen from Table 3.3, scores on the CES did not correlate with symptoms of anxiety as measured by the BAI (r = .17, ns).

3.5 Correlations between psychotic symptoms and centrality

Table 3.3 shows that scores on the CES were not correlated with symptoms of psychosis as measured by the PSYRATS.

3.6 Regression analysis examining centrality, post-psychotic appraisals and trauma

The fourth hypotheses looked at whether centrality retained an independent relationship with trauma and depression while in the presence of established predictors such as

appraisals by using regression analysis. To minimise the effects of co-linearity upon the estimation of the significance of each variable, a backward elimination ordinal least squares regression analysis was carried out. This analysis produces the maximally explanative regression equation using the minimum number of predictor variables. It is a particularly useful strategy to use in situations where predictor variables are inter-correlated (i.e., measure shared variance), because this analysis reduces the number of predictor variables and co-linearity between them without significantly reducing predictive accuracy This analysis provided a way of exploring whether centrality provided an independent contribution to predictions of post-psychotic trauma when controlling for post-psychotic appraisals.

First, the relationship between centrality, trauma, and appraisals was examined. Centrality of Event Scale-Turning point (CES-TP) and other variables significantly correlated with IES-R (PTCI self, world, blame; PBIQ shame, loss, control, marginalisation, entrapment; FoRSE fear of relapse, intrusions, awareness) were entered into a backward elimination least squares regression analysis with IES-R as the dependent variable. A significant multiple correlation was observed in the final regression model (R = .83, $F4$, 49 = 24.84, $p < 0.001$, N = 50), with the four remaining predictor variables[6] predicting 69% (R^2 = .69) of the variance. The four remaining variables were PBIQ-R shame (β = -.36, t = -2.26, p = 0.029), PBIQ-R loss (β = -.30, t = -1.99, p = 0.052), PBIQ-R social marginalisation (β = .46, t = 2.91, p = 0.006), and FoRSE intrusions (β = .63, t = 6.14, $p < 0.001$). Therefore psychosis related to shame, loss, a sense of social marginalisation, and on-going intrusive psychosis-related memories, were independently associated with post-psychotic trauma. However, Centrality-Turning point was not independently associated with post-psychotic trauma once post-psychotic appraisals were included in the regression analysis.

3.7 Centrality, post-psychotic appraisals, depression and anxiety

The same regression analysis was employed to explore whether the relationship between centrality and post-psychotic depression remained when controlling for post-psychotic appraisals. BDI-II scores were entered as the dependent variable and the centrality subscales and additional appraisals that significantly correlated with BDI-II scores (PTCI

[6] PSYRATS total scores were also included in the regression analysis because the presence of psychotic symptoms significantly correlated with IES-R total and subscale scores. However PSYRATS scores failed to independently predict shared variance when controlling for appraisals.

self, world; PBIQ shame, loss, control, marginalisation, entrapment; FoRSE fear of relapse, intrusions) were entered into the regression analysis. A significant multiple correlation was found in the final regression model (R = .79, F5, 49 = 16.95, p < 0.001, N = 50), accounting for 63% (R^2 = .63) of the variance in predicting post-psychotic depression. The remaining predictor variables included PTCI self (β = .44, t = 3.23, p = 0.002), PBIQ-R shame (β = -.26, t = -1.75, p = 0.088), PBIQ-R entrapment (β = .24, t = 1.77, p = 0.084), CES personal identity (β = .25, t = 2.27, p = 0.028), and PSYRATS total score (β = .33, t = 3.23, p = 0.002). Therefore, psychosis related appraisals of shame and entrapment, a negative view of the self, the degree to which psychosis has become part of personal identity and the presence of psychotic symptoms were all independently associated with post-psychotic depression. Therefore, along with known predictors such as post-psychotic appraisals, the degree to which psychotic related events become central to personal identity uniquely contributed to the occurrence of post-psychotic depression.

The correlation analysis outlined above, indicated that Centrality (and the three subscales) were not significantly correlated with anxiety therefore it was not appropriate to enter any centrality variable into a regression analysis with anxiety. However, exploratory regression analysis entering variables significantly correlated with anxiety (PTCI self, world; PBIQ shame, loss, control, marginalisation, entrapment; FoRSE fear of relapse, intrusions) as independent variables and total for BAI score as the dependent variable revealed a significant multiple correlation was found in the final regression model (R = .79, F5, 49 = 16.95, p < 0.001, N = 50), accounting for 59% (R^2 = .59) of the variance anxiety. The remaining predictor variables included PTCI self (β = .29, t = 1.73, p = 0.091), PBIQ-R shame (β = -.33, t = -2.22, p = 0.31), PBIQ-R entrapment (β = .29, t = 2.00, p = 0.052), and FoRSE fear of recurrence (β = .45, t = 2.84, p = 0.007). The final model suggests that appraisals of shame, entrapment, negative appraisals about self, and a fear of psychosis reoccurring is independently associated with anxiety.

3.8 Investigating the concept of centrality against appraisal subscales

Finally, we examined the relationship between the centrality of psychotic experiences and established appraisals of psychosis (e.g., PBIQ) in order to shed more light on exactly what the Centrality of Events Scale and its three subscales are measuring. Three separate regression analysis was carried out using each subscale of the CES as a dependent variable. First, we looked at Centrality of Events Scale-Inferences. Thus, appraisal variables which

were significantly correlated with CES-Inferences including PBIQ-Loss and all subscales of the PTCI were entered into a backward elimination regression analysis with CES-inferences as the dependent variable. This analysis resulted in a significant multiple correlation (R = .51, F2, 49 = 8.08, p = 0.001), which explained 26% (R^2 = .26) of the shared variance. The remaining predictor variables were PBIQ loss (β = -.27, t = -2.03, p = 0.048) and PTCI self-blame (β = .36, t = 2.74, p = 0.009). Thus, it appears that using experiences of psychosis for making every day inferences is independently associated with appraisals of loss and self-blame.

A similar regression analysis was carried out for CES personal identity. Thus, variables which were significantly correlated with CES personal identify, including all PTCI subscales and FoRSE-Fear of relapse, were entered as independent predictors with CES-personal identify as the dependent variable. This analysis resulted in a significant multiple correlation (R = .56, F2, 49 = 8.08, p = 0.001, N = 50), which explained 31% (R^2 = .31) of the shared variance. The remaining predictor variables were PBIQ-Loss (β = -.27, t = -1.81, p = 0.077) and PTCI-World (β = .36, t = 2.40, p = 0.020). Therefore, perceived loss following a psychotic illness coupled with negative appraisals about the world and other people were independently associated with CES personal identity.

Finally, CES-turning point and correlated appraisals including, which included all PTCI and FoRSE subscales, were entered into a similar regression analysis. A significant multiple correlation was found (R = .45, F1, 49 = 16.25, p = 0.001, N = 50), explaining 20% (R^2 = .20) of the shared variance. The remaining predictor variable was PTCI self-blame (β = .45, t = 3.50, p = 0.001). Therefore, it seems like people who regard psychosis as a central turning point appraise their psychosis in a self-blaming manner

Table 3.3 Correlation matrix of variables

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	**CES total**																					
2	**CES inferences**	.93**																				
3	**CES identity**	.92**	.78**																			
4	**CES turn point**	.84**	.67**	.67**																		
5	**IES total**	.25	.18	.21	.31*																	
6	**IES intrusions**	.23	.18	.19	.28*	.93**																
7	**IES arousal**	.12	.09	.09	.18	.92**	.83**															
8	**IES avoidance**	.31*	.21	.28*	.38**	.88**	.70**	.70**														
9	**BDI-II**	.44**	.37**	.45**	.37**	.56**	.58**	.55**	.42**													
10	**BAI**	.17	.10	.19	.18	.72**	.67**	.76**	.55**	.71**												
11	**PSYRATS**	.02	.00	-.02	.09	.49**	.51**	.52**	.33*	.49**	.52**											
12	**PTCI self**	.43**	.37**	.40**	.38**	.62**	.66**	.49**	.53**	.68**	.59**	.37**										
13	**PTCI world**	.43**	.30*	.52**	.33*	.61**	.55**	.49**	.60**	.64**	.61**	.41**	.74**									
14	**PTCI blame**	.44**	.44**	.32*	.45**	.28*	.30*	.13	.32*	.27	.24	.08	.52**	.35*								
15	**PBIQ shame**	-.37	-.26	-.48	-.25	-.58**	-.58**	-.53**	-.46**	-.59**	-.53**	-.28	-.67**	-.68**	-.31*							
16	**PBIQ control**	-.31	-.24	-.33	-.28	-.49**	-.54**	-.46**	-.33*	-.46**	-.43**	-.44**	-.57**	-.46**	-.19	.62**						
17	**PBIQ loss**	-.43	-.37	-.48	-.28	-.56**	-.56**	-.47**	-.48**	-.51**	-.42**	-.25	-.67**	-.58**	-.29*	.78**	.71**					
18	**PBIQ entrap**	-.31	-.22	-.37	-.24	-.44**	-.49**	-.36*	-.34*	-.40**	-.35*	-.27	-.62**	-.54**	-.30*	.72**	.73**	.83**				
19	**PBIQ margin**	-.36	-.25	-.46	-.25	-.37**	-.42**	-.39*	-0.26	-.48**	-.31*	-.20	-.64**	-.59**	-.27	.80**	.65**	.79**	.84**			
20	**FoRSE relapse**	.32*	.25	.33*	.30*	.70**	.74**	.63**	.54**	.70**	.74**	.57**	.78**	.76**	.39**	-.60**	-.57**	-.54**	-.60	-.58		
21	**FoRSE intrus**	.23	.13	.23	.30*	.77**	.75**	.73**	.63**	.56**	.74**	.57**	.64**	.62**	.40**	-.56	-.57	-.54	-.54	-.48	.82**	
22	**FoRSE aware**	.21	.21	.10	.28*	.30*	.27	.27	.27	.16	.26	.13	.23	.32*	.41**	-.19	.03	.06	.09	-.04	.36*	.29*

** Correlation is significant at the 0.01 level * Correlation is significant at the 0.05 level

Key: CES = Centrality of Events Scale, IES-R = Impact of Events Scale Revised, BDI-II = Beck Depression Inventory, BAI = Beck Anxiety Inventory, PSYRATS = Psychotic Symptoms Rating Scale, PTCI = Post-traumatic Cognitions Inventory, PBIQ-R = Personal Beliefs About Illness Questionnaire, FoRSE = Fear of Recurrence Scale.

4. Discussion

At present (to our knowledge) there is no empirical literature concerning the concept of centrality within a population with psychosis. The aim was to explore whether centrality of psychotic experiences was associated with trauma, depression and anxiety experienced following psychosis. The overall total score of Centrality within the current sample was high indicating that participants rated their psychosis has having high centrality. Indeed, comparisons with previous studies measuring centrality (see Table 3.1), indicated that the sample mean centrality score (69.88) in the current study was one of the highest yet recorded. Psychosis patients scored their experiences of psychosis as high on the CES, reporting that they often inferred about daily life events from the perspective of having a psychotic illness, felt psychosis impacted upon their sense of identity and that it marked a turning point in their life. Nor were there any recorded difficulties for individuals with psychosis completing the measure.

4.1 The relationship between centrality and post-psychotic trauma

Correlation and regression analyses were used to explore the first hypothesis which examined the relationship between centrality of psychosis and post-psychotic trauma symptoms. Correlation analysis showed a weak but non-significant relationship between total centrality and total post-psychotic trauma symptoms. This finding is inconsistent with previous studies which showed stronger relationships between centrality and symptoms of PTSD. Additional correlational analysis did however find significant relationships between different aspects of centrality and different PTSD symptoms. Specifically, we found that CES-turning point was correlated with intrusions and avoidance. Thus, those who felt their psychosis had been a marked turning point in their life reported more trauma-related intrusions and avoidance behaviours. In addition, there was a significant correlation between CES-personal identity and avoidance. Therefore, the first hypothesis was partly supported and the finding that aspects of centrality of psychotic experiences are related to post-psychotic trauma is a novel finding. However, it must be acknowledged the relationships between these aspects of centrality and trauma are weak and indeed subsequent regression analysis found that these relationships did not remain once additional psychosis appraisals were considered.

The relationship between post-psychotic trauma and centrality was investigated further by using regression analysis to explore whether their association remained when controlling for appraisals. Appraisals have been highlighted as key to determining the likelihood of trauma following traumatic events (Brown, et al., 2011; Ehlers & Clark, 2000; Foa, et al., 2013; Park, Mills, & Edmondson, 2012), particularly in regard to psychosis (Gumley & Schwannauer, 2006; Jackson, et al., 2004; White & Gumley, 2009). The final model showed that centrality was not significantly attributable for any of the variance in relation to who will suffer from post-psychotic trauma over and above appraisals. The final model predicted 69% of the variance in predicting post-psychotic trauma, much of which was attributed to social factors, appraisals about psychosis as something to be ashamed of and that the individual believes they have lost value within themselves that makes them les socially desirable. Of these social appraisals, the largest beta coefficient related to social marginalisation (β = .46). The largest beta coefficient recorded however was attributed to fears about the acute phase of the illness returning and on-going experiences of illness-related thoughts, images and negative emotions associated with the illness (β = .63). These findings are consistent with previous findings (White & Gumley, 2009). These factors most likely create a sense of current threat that maintains post-psychotic traumatisation through an interaction between perceived negative social consequences and fear of becoming acutely psychotic again, potentially leading to further social consequence. This type of traumatisation may have a weaker relationship with centrality than other traumas previously been examined (Berntsen & Rubin, 2006, 2007). In summary then, despite a relationship between some aspects of centrality (e.g.: turning point and personal identity) and post-psychotic trauma existing within the sample, the overall appraisal process (Ehlers & Clarke, 2000) that individuals engage in following psychosis is a better model of post-psychotic trauma when compared to one based on the integration of an event into memory (Berntsen & Rubin, 2006, 2007). The appraisal process that participants engaged in had a more direct and stronger association with symptoms of trauma and depression than the concept of centrality. Though not providing as strong a contribution as previous findings (Berntsen & Rubin, 2006, 2007; Boals, 2010; Brown, et al., 2010), the centrality concept does however illuminate the process by which individuals attempt to give meaning to psychosis, both personally and socially, either increasing or decrease their level of trauma symptoms and resulting distress.

The early stage of the literature regarding centrality in psychosis may be reflected in the sensitivity of the centrality measure to the phenomenology of post-psychotic trauma. It is not yet clear whether the trauma of having a psychotic illness, with causal factors internal to the individual, mark it out as something different than an objective event that is possible to get some distance from (e.g.: war zone or road traffic accident). Events similar in nature to psychosis such as pain (Perri & Keefe, 2008) and illness (Ogle, Rubin, Berntsen, & Siegler, 2013) have received similarly high scores on centrality but have also shown a stronger relationship than found in the current study. This could suggest something specific about psychosis populations and their experiences that weaken the relationship between trauma symptoms and centrality. Based on the current findings, and preceding research (Birchwood, et al., 2007; Turner et al., 2013), one possibility is that the nature of psychosis has a consequence on an individual's sense of social status, marked by perceptions of social marginalization, loss and shame. It may be that trauma of a social nature has a weaker relationship with centrality than events such as war or road traffic accidents. However, given that this is the first study examining centrality of psychosis and post-psychotic trauma it is too early to conclude that there is no such relationship. Thus, the study requires replication. It is also possible that measurement issues impacted on this relationship as the majority of previous centrality studies have not used the IES-R.

4.2 The relationship between centrality and post-psychotic depression and anxiety

A similar exploration of the relationship between centrality and post-psychotic depression was carried out using the same methods used for post-psychotic trauma. Correlation analysis showed a stronger relationship between the centrality of psychosis and post-psychotic depression than post-psychotic trauma. Specifically, there were more depressive symptoms when individuals believed their psychosis had affected their sense of themselves, which lead to more illness-related inferences in their daily lives. How much their lives had changed in comparison to how the way it was before the illness also related to depressive symptoms. These findings fit with previous evidence that centrality is associated with depressive symptoms (Berntsen & Rubin, 2006, 2007; Brown, et al., 2010) and go against other findings which failed to find a relationship (Newby & Moulds, 2011). One reason for a stronger relationship between post-psychotic depression and centrality may be the very reason a weaker relationship was found with trauma. Post-psychotic depression has been conceptualised as having a distinctly social flavour to it, in that it is

concerned with the appraisal of lost social status and stigma where the person exists more negatively in the eyes of others (Birchwood, et al., 2000; Birchwood, et al., 2007; Iqbal, Birchwood, Chadwick, & Trower, 2000). Higher scores of centrality could be reflecting the marked social impact that psychosis has had, which relates strongly to depressive symptoms as individuals mourn lost social status and deal with perceptions of increased marginalization.

In accordance with this theory, it became important to look closely at post-psychotic appraisals because they have been strongly implicated in the development of post-psychotic depression (Birchwood, 2003; Iqbal, et al., 2000; Upthegrove, 2011). Regression analysis again explored whether centrality independently predicted post-psychotic depression when controlling for appraisals. Again the final regression model accounted for a large degree of the variance (63%), with five variables independently accounting for the final percentage. The largest beta co-efficient was assigned to negative self-evaluation (β = .44). Experiencing positive symptoms of psychosis was the second largest predictor of participant's mood remaining low. Again shame about having a psychotic illness remained an important predictor. Also believing that being a psychosis patient had become central to personal identity and coupled with thoughts that one was trapped by the illness completed the model. Thus centrality, as related to the effect of psychosis on a sense of personal identity, provided significant unique explanatory power about who might develop post-psychotic depression. This is again a new finding in psychosis research and supports the applicability of centrality to a population with psychosis when measuring likelihood of depressive symptoms after the illness. The data also fit with findings from previous research (Birchwood et al., 2000; Gumley & Schwannauer, 2006) that examined psychosis patients with post-psychotic depression and found they were more likely to attribute the cause of their illness to themselves and to perceive a greater loss of autonomy, valued social role and hold perceptions of being trapped and humiliated by their illness. These data fit with the previous research implicating psychosis as having a significant and often negative social impact on an individual.

In comparison to symptoms of depression, we found no relationship between centrality and symptoms of anxiety measured by the BAI. This conflicts with previous research that found an association between the two (Berntsen & Rubin, 2007) but is in agreement with other research which also failed to find an association (Newby & Moulds,

2011). This again fits with the understanding of the data that centrality within the current study is picking up on the impact of a past event (acute psychosis) on an individual as they appraise their current status in comparison with a previous one. Anxiety is an emotional state more akin to future threat rather than loss of things that once were.

4.3 What is centrality?

Our final analysis investigated the relationship between different aspects of centrality and post-event appraisals. Despite the CES being described as unifactorial (Berntsen & Rubin, 2006) and centrality being a superordinate concept containing overlapping subscales, there have been recent attempts to explore underlying factors (Gauer, et al., 2013; Robinaugh & McNally, 2011). To continue this inquiry, a separate regression analysis was carried out on each of the centrality subcomponents, inferences, personal identity and turning point. In relation to CES-inferences, PBIQ-Loss and PTCI-Self-blame absorbed the shared variance of other subscales and remained significant predictors of CES-inferences. The process of drawing inferences from an event such as psychosis appears to be related to the degree of loss and self-blame an individual's experiences following the illness. This could indicate a type of daily rumination on what was before the illness and what is now and a feeling that the individual has caused this to happen. Likewise, CES-Personal identity was found to relate to PBIQ-Loss and PTCI-World. Therefore, an appraisal process is also implicated here, perhaps an interaction between reflections on personal identity triggered by a sense of loss following psychosis and thoughts regarding how the world beyond the self will react to this. Lastly, CES-Turning point and PBIQ-Self-blame showed a unique relationship. This finding fits with previous research that has identified psychosis patients have lower self-esteem and are prone to negative attributions such as believing that they are the reason they have become unwell (Birchwood et al., 2000; Gumley & Schwannauer, 2006). External attributions of blame and shame may become more external over time for people with a more chronic illness who suffer from more than one psychotic episode but future research will be needed to confirm this.

4.4 Methodological strengths and limitations of the study

There are recognised problems with self-report measures in the study of trauma (Ozer, et al, 2008). The measures used in the current study were self-report in nature. However, a strength of the methodology employed was that researchers systematically first completed both the CES and IES-R with participants in order to ensure they were anchored to using

psychosis as the event from which to answer all other measures where appropriate. This also helped control the contamination on current items from the impact of previously experienced traumas prior to psychosis. In addition, the participant's capacity to read and write could be assessed and supported if needed and researchers also had the ability to check over measures before ending the interviews to follow-up on missing data, offsetting problems with how missing data should be dealt with (Ozer, et al., 2008). Although there are other issues with researchers being present for what are potentially distressing or shameful questions (McDonald & Morley, 2001), no participants voiced concerns to researchers or their care coordinators after participation.

The use of a cross-sectional design limits inferences in regard to the factor of time. Other researchers have noted that patients are engaged within a recovery process following the acute phase of psychosis and that this can affect appraisals of their resources and future, symptoms and other target variables being measured within this study. Indeed it has been shown that there is an important link between time and the potential for traumatic interactions (Bonanno, et al., 2010), including appraisals (Jackson, et al., 2004). However due to ethical issues about involving patients in the acute phase of their illness in research and the exploratory aims of the study a cross-sectional approach was necessary. Cross-sectional designs are also limited in their ability to draw out causal inferences. As with the current data, it is very hard to draw out the causal sequence, between for example shame and depression, which limits the scope of the conclusions to noting novel associations between variables rather than how they are causality sequenced.

The use of a first-episode population was strength of the study. Using this population meant there was less variance within the sample, for example in the number of episodes, age and use of level of medication. Additionally, the level of care and service contact was more homogenous, as was use of medication and life stage. The study will need replication with more chronic psychosis samples to examine centrality across the life span of people with psychosis.

Lastly there is strong evidence to suggest that different subgroups of patients exist within diagnostic categories of psychosis (Suslow, Roestel, Ohrmann, & Arolt, 2003). Not least a group with predominantly negative symptoms which are often underrepresented within research due to the difficulty engaging them. The participation rate within the current study was roughly 65%. It is likely this group are over-represented in the 35% that did not wish to participate. This also does not include those patients whom care

coordinators might have felt were unsuitable or unstable, which also introduced a selection bias which likely also have reduced the chances for them to participate due to realistic expectations that they would not have engaged. It remains a challenge for researchers to consider how better to represent this sample in research in order to make sure evidence is indeed efficacious for them.

4.5 Implications

The results suggest that, in the absence of appraisals, measuring the degree an event becomes central to identify could be a useful predictor of post-psychotic depression and to a lesser extent trauma. This may be different for other populations outside of psychosis however, or for people with a more longstanding chronic psychotic illness. It remains unclear how people appraisal of "central events" could change over a longer period of time when suffering from multiple episodes of psychosis and how this could affect them with this research remaining to be done. Nevertheless, the CES can be used to inform clinical practice and may represent a way of collecting clinically relevant data where patients find it difficult to access or disclose thoughts or appraisals following their psychotic illness. Centrality might also dove-tail nicely with clinical interventions seeking to improve a patient's self-narrative following a traumatic event such as psychosis (Bernard, Jackson, & Jones, 2006; Pennebaker, 1997). Jackson and colleagues (Jackson, et al., 2009) have also had success aiding healthier processing and integrating of psychosis into a self-narrative. This fits with research highlighting the transactional nature of coping with psychosis and the important role appraisals have in defining perceptions of control, sense of self and way out of illness (Roe, Yanos, & Lysaker, 2006).The current data also helps to unpick this relationship between centrality and appraisals by showing that the concept of centrality and the subordinate concepts contained within it are likely part of an appraisal process that is triggered by significant life events that individuals find meaningful. Specific to the current psychosis population, the data shows that the experiencing a psychotic episode has global repercussions for individuals perceived social status and social desirability. This fits with the increasing conceptualisation of psychosis as a disorder of adaptation to social context (van Os, Kenis, & Rutten, 2010), where perceived social defeat, low self-esteem and sensitivity to rejection act as predisposing and perpetuating factors for the illness (Birchwood, 2003). Clearly greater effort by mental health services and more general

services to design assessments and interventions which positively impact on the problems of shame, social exclusion and stigma in regard to psychosis and mental health in general will go some way to improving outcomes for this patient group (Turner et al., 2013; Kleim, et al., 2007; Mueser & Rosenberg, 2003). Where developments have already begun, especially in clinical interventions which target shame and stigma (Birchwood, et al., 2007), results have been successful and are offering ways of engaging client groups who otherwise might have disengaged from services or therapy due to the effect of shame. Current developments in the use of "compassionate mind training" (Gilbert, 2010), the role out of recovery-focused approaches to care and the introduction of measures focusing on wellbeing rather than symptomatology are other positive steps against a stigmatising or shaming approach to mental health care. The current data suggests that CES would make a useful addition to outcome measures for such interventions.

4.6 Conclusions

To our knowledge, this is the first study examining the concept of centrality within a psychosis population. The data offer some support for a theory of trauma and depression that places greater weight on appraisals (Ehlers & Clark, 2000) rather than memory (Rubin, Berntsen, et al., 2008; Rubin, Boals, et al., 2008). Overall, the data suggest that the global impact of psychosis on perceptions of self in relation to social context are often negative and can lead to symptoms of trauma and depressive symptomatology. The current study found some relationships between centrality and trauma but a stronger relationship with depression was the main finding. However, given that this is the first study with psychosis replication is required to see whether the relationship is a true one.

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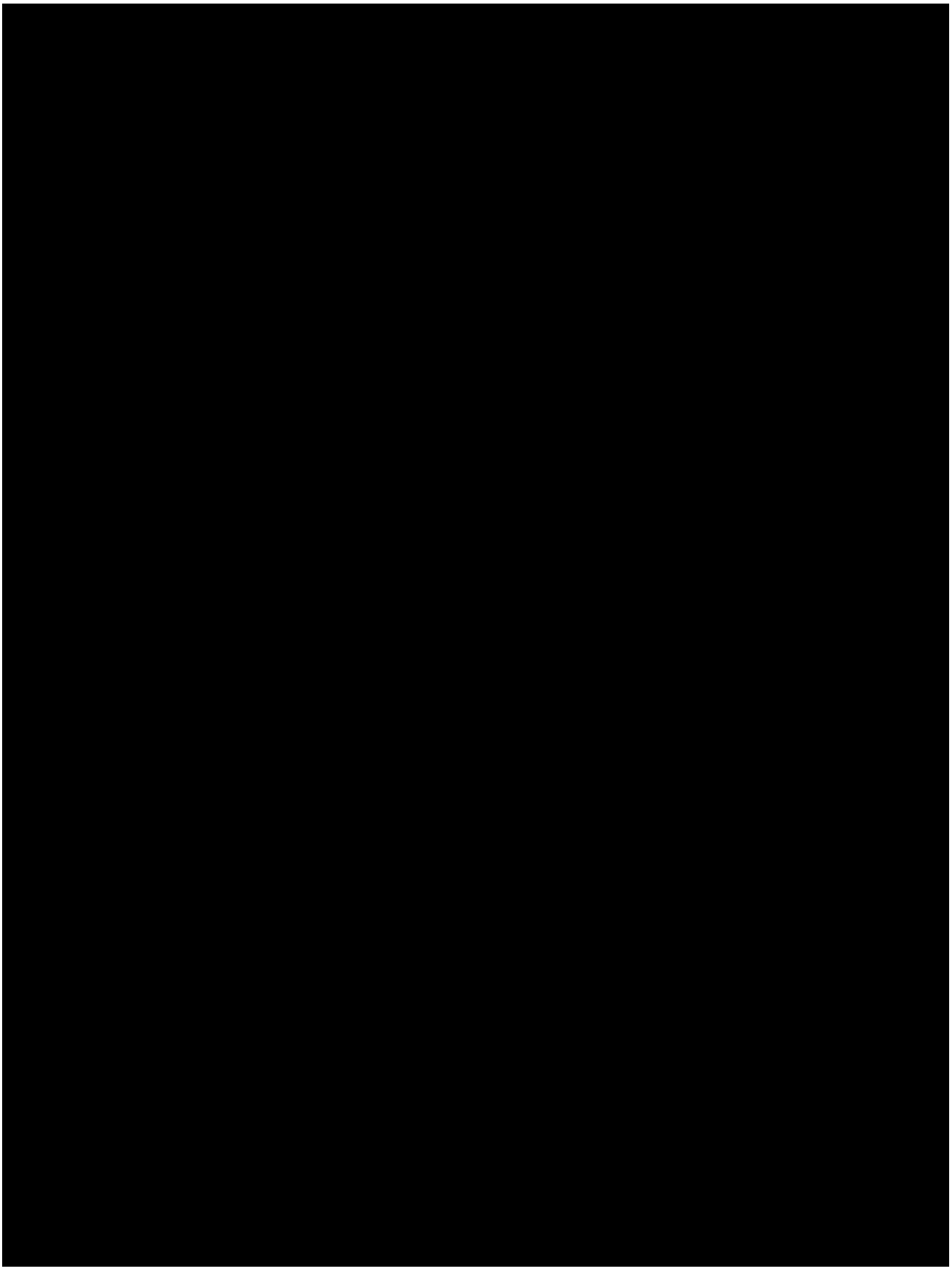
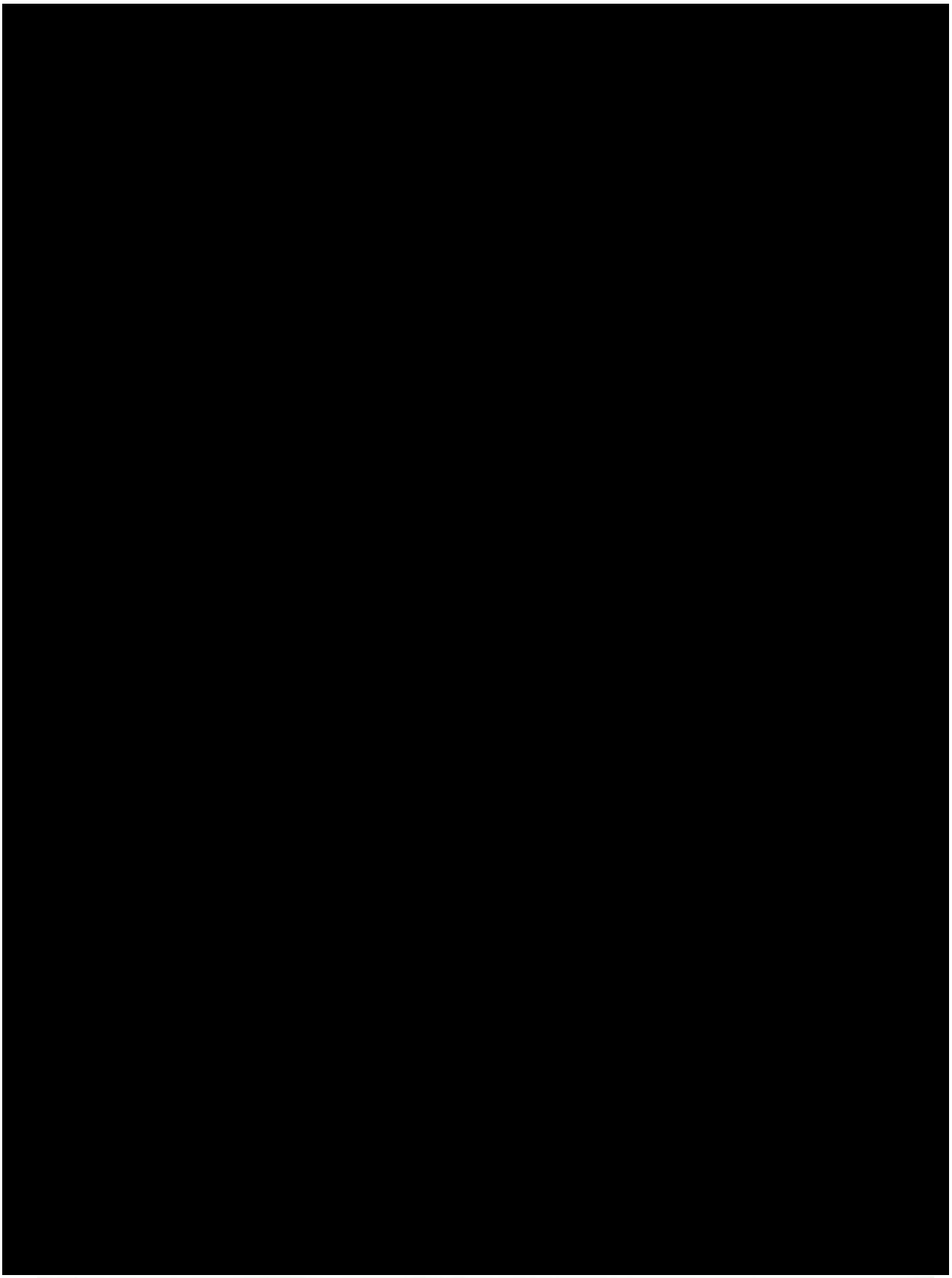
Appendix 1: Information on demographics of sample

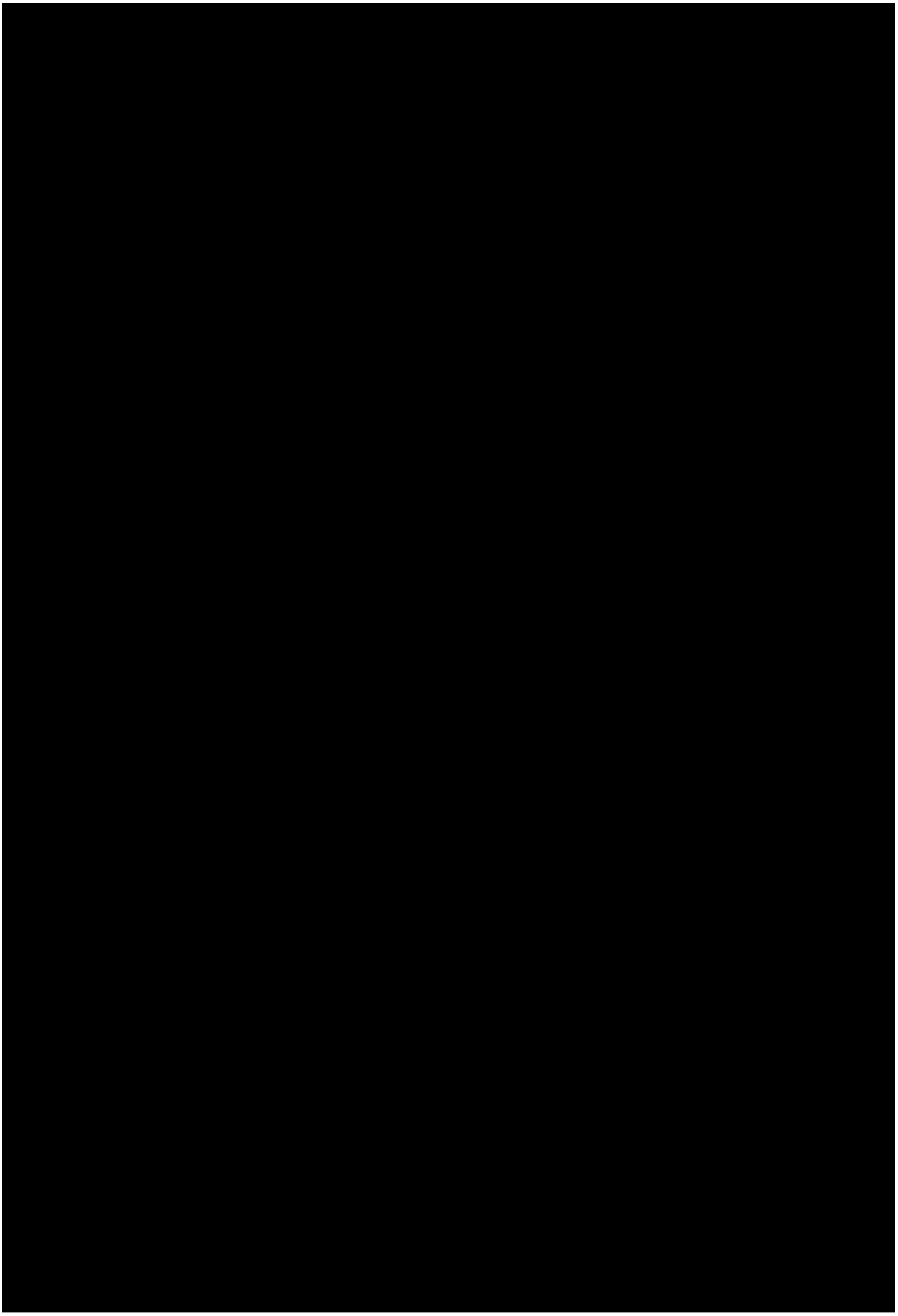
N	**50**
Mean age in years (SD)	25 (4.8)
Gender	
- % Female	30%
Ethnicity	
- White	40%
- Asian	30%
- Black	18%
- Chinese	2%
- Mixed	8%
- Other	2%
Relationship	
- Single	64%
- In a relationship	24%
- Married	8%
- Separated/divorced	4%
Accommodation	
- Living with parents	60%
- Living alone	20%
- Supported living	8%
- Living with friends	6%
- Living with spouse/partner	6%
Mean no. of days since illness onset (SD)	920 (454)
Diagnosis	
- Psychosis NOS	44%
- Schizophrenia	26%
- Bipolar disorder	20%
- Schizoaffective	6%
- Substance induced psychosis	2%
- Delusional disorder	2%

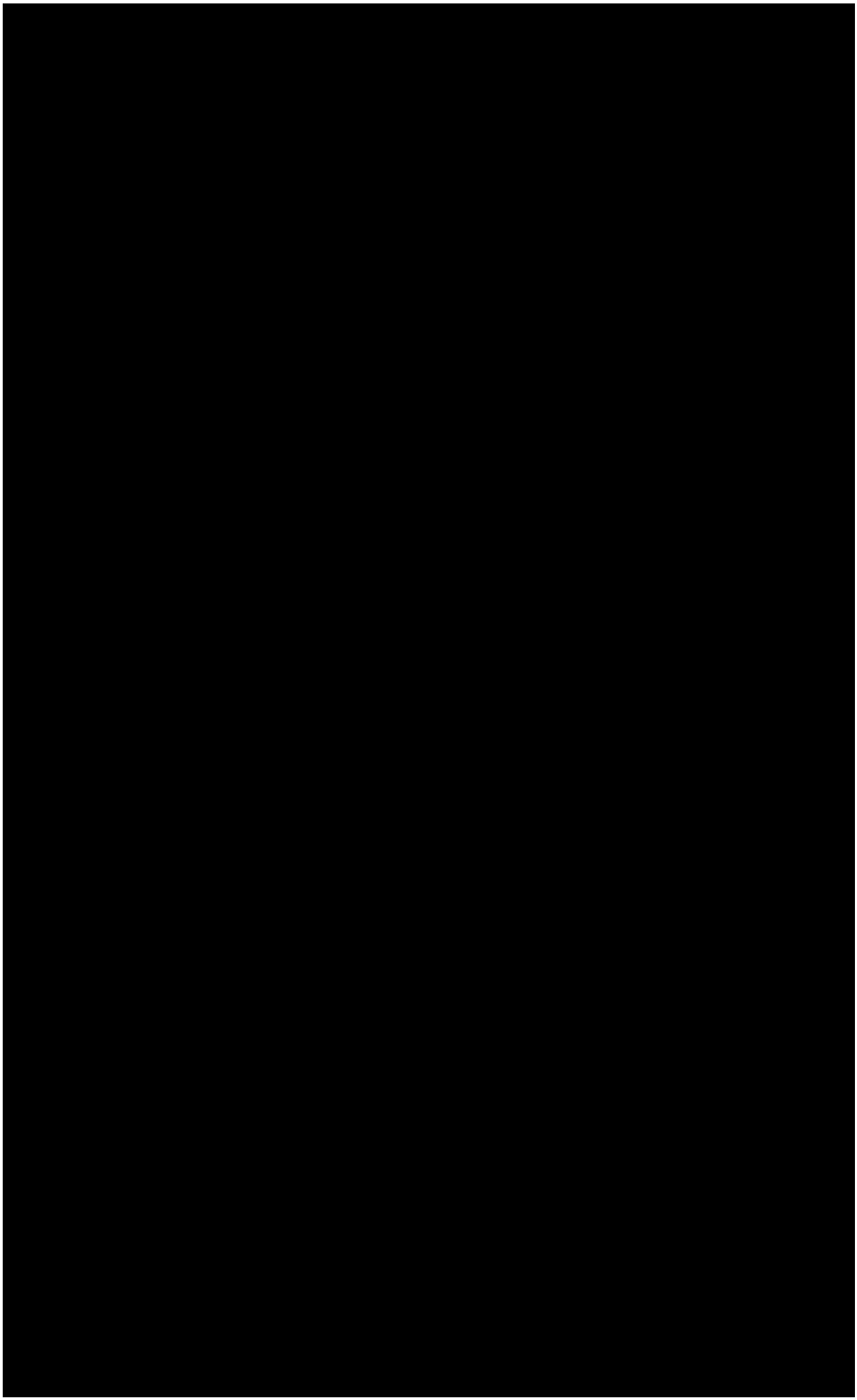
Appendix 2: Ethics Approval

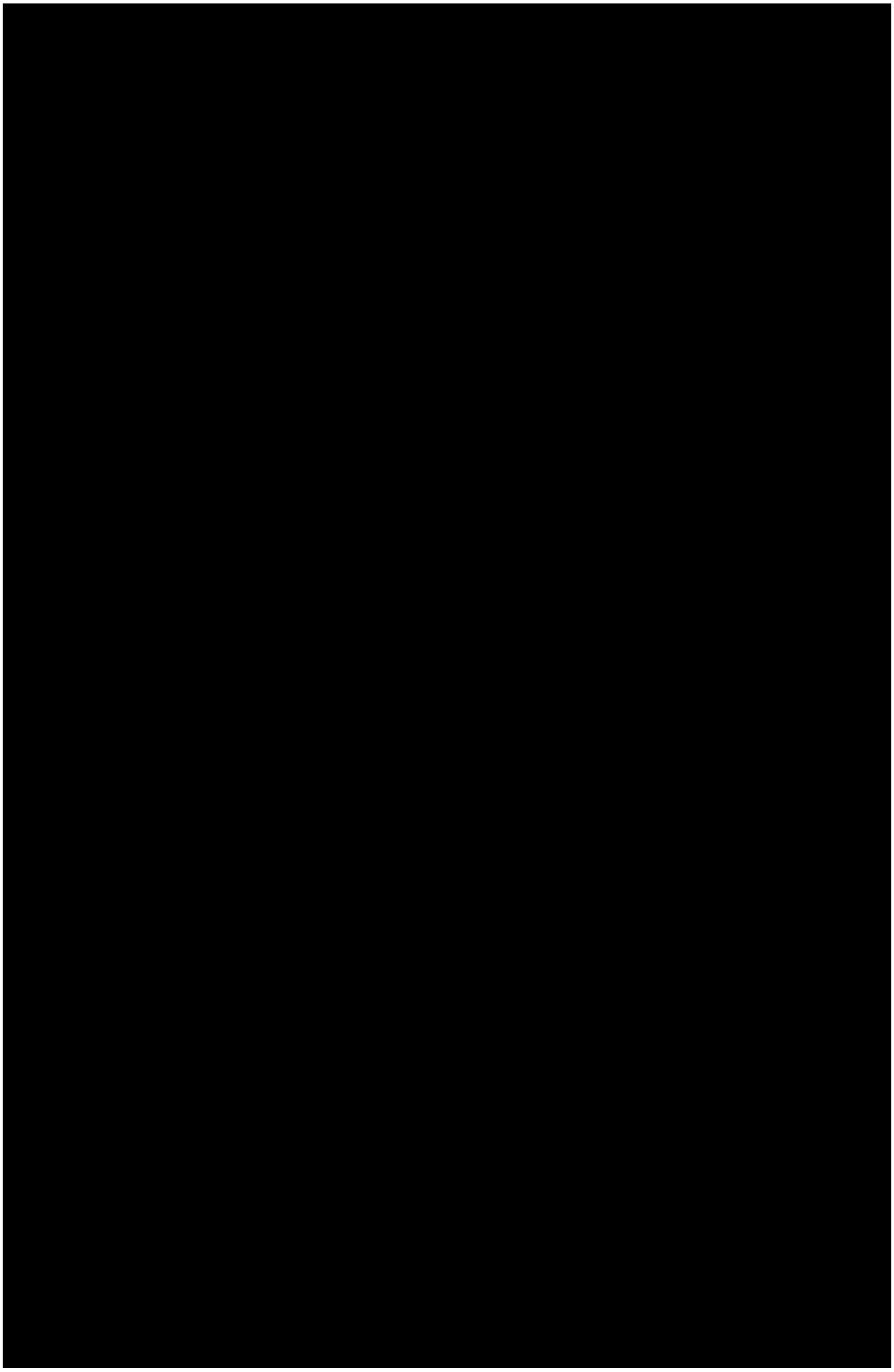


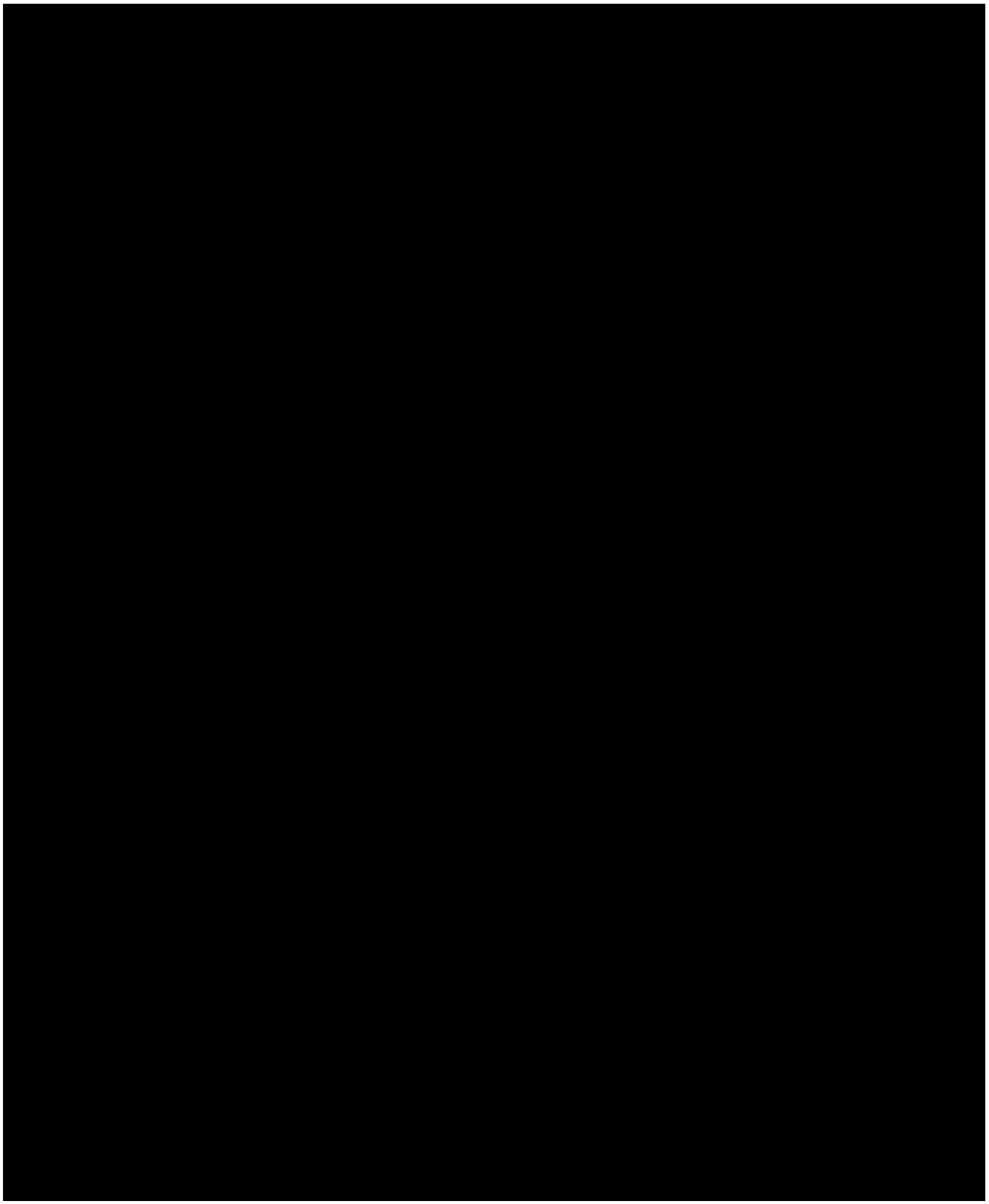


Appendix 3: Participant Information Sheet









Appendix 4: Consent Form

Participant Consent Form (Version 2-01.04.2012)

Research Site: Birmingham and Solihull Mental Health Foundation Trust

Study Title: The Centrality of Psychotic Experiences

Participant ID No.: _____

Title of Project: The Centrality of Traumatic Psychotic Experiences: Impact on Post-Psychotic Emotional Dysfunction

Researcher: James Dixon

Please initial box

1. I confirm that I have understood the information sheet dated 01.04.12 (version 2) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time during the research interview, without giving any reason, without my own mental health care or legal rights being affected. ☐
3. I understand that I might find some of the questions upsetting. ☐
4. I understand that relevant sections of my medical notes and data collected during the study may be looked at by individuals from the University of Birmingham from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these permission for these individuals to have access to my records. ☐
5. I understand that the research interview and questionnaires used within the interview will be kept confidential and in a secure place. Information from my interview may be published in any write-up of the data, but that my name will not be attributed to any such information and that I will not be identifiable by my information. ☐
6. I agree to be contacted in the future if follow-up research is conducted. ☐
7. I agree to take part in the above study. ☐

.....	.....	.....
Name of participant	Date	Signature
.....	.....	.....
Name of researcher	Date	Signature

Appendix 5: Research Measures

Centrality of Events Scale

Please think back upon your experience of your psychotic illness and answer the following questions in an honest and sincere way, by circling a number from 1 to 5.

	Totally Disagree	Disagree	Neither	Agree	Totally Agree
1. This event has become a reference point for the way I understand new experiences.	1	2	3	4	5
2. I automatically see connections and similarities between this event and experiences in my present life.	1	2	3	4	5
3. I feel that this event has become part of my identity.	1	2	3	4	5
4. This event can be seen as a symbol or mark of important themes in my life.	1	2	3	4	5
5. This event is making my life different from the life of most other people.	1	2	3	4	5
6. This event has become a reference point for how I understand myself and the world.	1	2	3	4	5
7. I believe that people who have haven't experienced this type of event think differently than I do.	1	2	3	4	5
8. This event tells a lot about who I am.	1	2	3	4	5
9. I often see a connection and similarities between this event and my current relationships with other people.	1	2	3	4	5
10. I feel that this event has become a central part of my life story.	1	2	3	4	5
11. I believe that people how haven't experience this type of event have a different way of looking upon themselves than I have.	1	2	3	4	5
12. This event has coloured the way I think and feel about other experiences.	1	2	3	4	5
13. This event has become a reference point for the way I look upon my future.	1	2	3	4	5
14. If I were to weave a carpet of my life, this event would be in the middle with threads going out to many other experiences.	1	2	3	4	5
15. My life story can be divided into two main chapters: one is before and one is after this event happened.	1	2	3	4	5
16. The event permanently changed my life.	1	2	3	4	5
17. I often think about the effects this event will have on my future.	1	2	3	4	5
18. This event was a turning point in my life.	1	2	3	4	5
19. If this event had not happened to me, I would be a different person today.	1	2	3	4	5
20. When I reflect on my future, I often think back to this event.	1	2	3	4	5

IES-R

People often find having a mental illness stressful. We would like to you complete this questionnaire in relation to the most stressful thing that happened to you when you were unwell. This could be something like hearing a negative voice (if you ever heard voices), it may be a hospital admission, or if may have been a belief or worry you had. Please complete this questionnaire in relation to the most stressful part of your illness or breakdown. Write in the space below what this event was and when it happened.

EVENT: _____ WHEN? _____

Below is a list of difficulties that people sometimes experience after stressful life events. Please read each item and indicate how much you were distressed by any such difficulties during the past week in relation to the event indicated above. Please circle the response.

		Not at all	**A little bit**	**Moderately**	**Quite a bit**	**Extremely**
1	Any reminder brought back feelings about it					
2	I had trouble staying asleep					
3	Other things kept making me think about it					
4	I felt irritable and angry					
5	I avoided letting myself get upset when I thought about it or was reminded of it					
6	I thought about it when I didn't mean to					
7	I felt as if it hadn't happened or wasn't real					
8	I stayed away from reminders about it					
9	Pictures about it popped into my mind					
10	I was jumpy and easily startled					
11	I tried not to think about it					
12	I was aware that I still had a lot of feelings about it, but I didn't deal with them					
13	My feelings about it were kind of numb					
14	I found myself acting or feeling as though I was back at that time					
15	I had trouble falling asleep					
16	I had waves of strong feelings about it					
17	I tried to remove it from memory					
18	I had trouble concentrating					
19	Reminders of it caused me to have physical reactions, such as sweating, trouble breathing, nausea, or a pounding heart					
20	I had dreams about it					
21	I felt watchful or on guard					
22	I tried not to talk about it					

The Psychotic Symptom Rating Scales
Interview Schedule
Gillian Haddock
Version 2009

Fear of Recurrance Scale
Gumley & Schwannauer 2006 Copyright

Post-traumatic Cognitions Inventory (PTCI)

ID: _____ Initials: _____ Date: _____

We are interested in the kind of thoughts, which you may have had after your psychotic illness or nervous breakdown. Below are a number of statements that may or may not be representative of your thinking.

Please read each statement carefully and tell us how much you AGREE or DISAGREE with each statement.

People react to stressful events like a psychotic illness or nervous breakdown in many different ways. There are no right or wrong answers to the statements.

	Totally Disagree			Neutral			Totally Agree
1. The event happened because of the way I acted.	11	22	33	44	55	66	77
2. I can't trust that I will do the right thing.	11	22	33	44	55	66	77
3. I am a weak person.	11	22	33	44	55	66	77
4. I will not be able to control my anger and will do something terrible.	11	22	33	44	55	66	77
5. I can't deal with even the slightest upset.	11	22	33	44	55	66	77
6. I used to be a happy person but now I am always miserable.	11	22	33	44	55	66	77
7. People can't be trusted.	11	22	33	44	55	66	77
8. I have to be on guard all the time.	11	22	33	44	55	66	77
9. I feel dead inside.	11	22	33	44	55	66	77
10. You can never know who will harm you.	11	22	33	44	55	66	77
11. I have to be especially careful because you never know what can happen next.	11	22	33	44	55	66	77
12. I am inadequate.	11	22	33	44	55	66	77
13. If I think about the event, I will not be able to handle it.	11	22	33	44	55	66	77
14. The event happened to me because of the sort of person I am.	11	22	33	44	55	66	77
15. My reactions since the event mean that I am going crazy.	11	22	33	44	55	66	77
16. I will never be able to feel normal emotions again.	11	22	33	44	55	66	77
17. The world is a dangerous place.	11	22	33	44	55	66	77

18. Somebody else would have stopped the event from happening.	11	22	33	44	55	66	77
19. I have permanently changed for the worse.	11	22	33	44	55	66	77
20. I feel like an object, not like a person.	11	22	33	44	55	66	77
21. Somebody else would not have gotten into this situation.	11	22	33	44	55	66	77
22. I can't relay on other people.	11	22	33	44	55	66	77
23. I feel isolated and set apart from others.	11	22	33	44	55	66	77
24. I have no future.	11	22	33	44	55	66	77
25. I can't stop bad things from happening to me.	11	22	33	44	55	66	77
26. People are not what they seem.	11	22	33	44	55	66	77
27. My life has been destroyed by my illness/nervous breakdown.	11	22	33	44	55	66	77
28. There is something wrong with me as a person.	11	22	33	44	55	66	77
29. My reactions since the event show that I am a lousy coper.	11	22	33	44	55	66	77
30. There is something about me that made the event happen.	11	22	33	44	55	66	77
31. I feel like I don't know myself anymore.	11	22	33	44	55	66	77
32. I can't rely on myself.	11	22	33	44	55	66	77
33. Nothing good can happen to me anymore.	11	22	33	44	55	66	77

Personal Beliefs About Illness Questionnaire-Revised (PBIQ-R)

Please indicate on the scale below, the degree to which you agree with the following statements about your nervous breakdown or psychotic illness.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. My illness stops me doing things I want to do.	1	2	3	4
2. I find it difficult to cope with my current symptoms.	1	2	3	4
3. I know when I am relapsing but I cant do anything about it.	1	2	3	4
4. I am powerless to influence or control my illness.	1	2	3	4
5. My illness stops me getting on with things I want to do.	1	2	3	4
6. Society needs to keep people with my illness apart form everybody else.	1	2	3	4
7. I feel excluded because of my illness.	1	2	3	4
8. I am embarrassed because of my illness.	1	2	3	4
9. My illness is too delicate/brittle.	1	2	3	4
10. I am ashamed about my illness.	1	2	3	4
11. Because of my illness I don't fit in.	1	2	3	4
12. I have changed for the worse because of my illness.	1	2	3	4
13. My illness prevents me from having friends and relationships.	1	2	3	4
14. My illness prevents me from planning for my future.	1	2	3	4
15. My relationship with my friends has changed for the worse.	1	2	3	4
16. I feel an outsider because of my illness.	1	2	3	4
17. I am intimidated by my illness.	1	2	3	4
18. I feel trapped by my illness.	1	2	3	4
19. Because of my illness others see me as fragile and weak.	1	2	3	4
20. Others look down on me because of my illness.	1	2	3	4

Beck Depression Inventory Version 2
Copyright Psychological Corporation

BAI

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by each symptom during the PAST WEEK, INCLUDING TODAY, by placing an X in the corresponding space in the column next to each symptom.

	Not at all	Mildly	Moderately	Severely
1. Numbness of tingling.				
2. Feeling hot.				
3. Wobbliness in legs.				
4. Unable to relax.				
5. Fear of the worst happening.				
6. Dizzy or lightheaded.				
7. Heart pounding or racing.				
8. Unsteady.				
9. Terrified.				
10. Nervous.				
11. Feelings of choking.				
12. Hands trembling.				
13. Shaky.				
14. Fear of losing control.				
15. Difficulty breathing.				
16. Fear of dying.				
17. Scared.				

Questions Regarding Use of Drugs and Alcohol

Have you used alcohol over the last 30 days? **Y____ N_____**

No. of days alcohol used: **_____**

No of days high from alcohol: **_____**

No of days where more than three drinks consumed: **_____**

Have you used any drugs over the last 30 days? **Y____ N_____**

Were they prescribed to you (excluding over-the-counter)? **Y____ N_____**

Did you use more than a prescribed amount? **Y____ N_____**

Have you used over-the-counter drug to get high? **Y____ N_____**

Other Drugs

What were they?

_____

How much?

_____

How often?

_____

When was the last time you used?

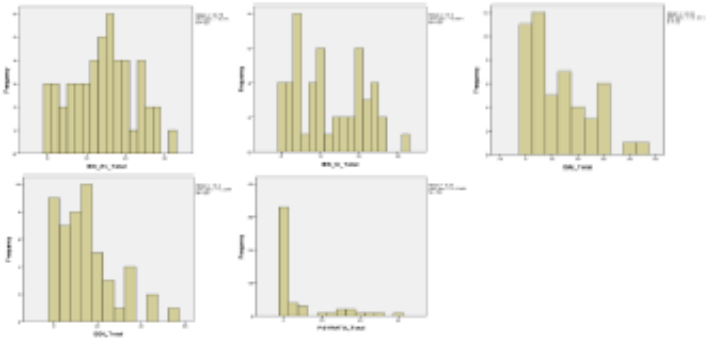
_____

Appendix 6: Non-parametric Correlations

SPSS Data Output showing non-parametric correlations between variables.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
IES_Av_Total	50	0	32	13.76	8.140	.044	-1.142
IES_In_Total	50	0	31	11.80	8.661	.275	-1.190
IES_Hyp_Total	50	0	25	8.44	6.796	.399	-1.027
IES_Total	50	0	88	33.92	21.515	.258	-.835
BAI_Total	50	0	44	12.92	11.014	.819	-.268
BDI_Total	50	0	53	15.20	12.894	1.005	.729
PSYRATS_Total	50	0	58	8.26	15.206	1.662	2.530



Nonparametric Correlations

			IES_Av_Total	IES_In_Total	IES_Hyp_Total	IES_Total	PTCI_Self_Total	PTCI_World_Total	PTCI_Blame_Total	BAI_Total	BDI_Total	PSYRATS_Total	CES_AP_Total	CES_PI_Total	CES_TP_Total	CES_Total	FORSE_FoR_Total	FORSE_Aw_Total	FORSE_In_Total	PBIQ_Shame_Total	PBIQ_Loss_Total	PBIQ_Entrap_Total	PBIQ_Control_Total	PBIQ_SocMar_Total
Spearman's rho	IES_Av_Total	Correlation Coefficient	1.000	.668**	.873**	.972**	.513**	.606**	.290*	.539**	.391**	.364**	.239	.322*	.307*	.329*	.527**	.233	.632**	-.481**	-.454**	-.331*	-.316*	-.260
		Sig. (2-tailed)		.000	.000	.000	.000	.000	.041	.000	.005	.009	.094	.023	.006	.020	.000	.104	.000	.000	.000	.019	.026	.049
		N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	IES_In_Total	Correlation Coefficient	.668**	1.000	.810**	.927**	.626**	.549**	.318*	.632**	.596**	.521**	.341*	.286*	.324*	.286*	.734**	.295*	.784**	-.598**	-.596**	-.491**	-.556**	-.437**
		Sig. (2-tailed)	.000		.000	.000	.000	.000	.025	.000	.000	.000	.092	.044	.022	.044	.000	.039	.000	.000	.000	.000	.000	.001
		N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	IES_Hyp_Total	Correlation Coefficient	.873**	.810**	1.000	.896**	.453**	.484**	.101	.755**	.539**	.459**	.159	.176	.319*	.174	.626**	.231	.755**	-.535**	-.467**	-.360*	-.452**	-.335*
		Sig. (2-tailed)	.000	.000		.000	.001	.000	.485	.000	.000	.000	.271	.221	.027	.227	.000	.107	.000	.000	.001	.010	.001	.017
		N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	IES_Total	Correlation Coefficient	.972**	.927**	.896**	1.000	.594**	.604**	.270	.695**	.576**	.462**	.253	.312*	.356*	.313*	.691**	.287*	.792**	-.608**	-.570**	-.441**	-.464**	-.398**
		Sig. (2-tailed)	.000	.000	.000		.000	.000	.058	.000	.000	.000	.078	.028	.011	.027	.000	.061	.000	.000	.000	.001	.000	.004
		N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	PTCI_Self_Total	Correlation Coefficient	.513**	.626**	.453**	.594**	1.000	.750**	.504**	.570**	.711**	.409**	.414**	.452**	.381**	.461**	.706**	.249	.653**	-.668**	-.653**	-.592**	-.559**	-.643**
		Sig. (2-tailed)	.000	.000	.001	.000		.000	.000	.000	.000	.003	.003	.001	.006	.000	.000	.082	.000	.000	.000	.000	.000	.000
		N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	PTCI_World_Total	Correlation Coefficient	.606**	.549**	.484**	.604**	.750**	1.000	.354*	.631**	.656**	.423**	.367**	.570**	.341*	.476**	.777**	.335*	.664**	-.599**	-.579**	-.502**	-.456**	-.599**
		Sig. (2-tailed)	.000	.000	.000	.000	.000		.012	.000	.000	.002	.009	.000	.015	.000	.000	.017	.000	.000	.000	.000	.001	.000
		N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	PTCI_Blame_Total	Correlation Coefficient	.290*	.318*	.101	.270	.504**	.354*	1.000	.319*	.329*	.190	.452**	.312*	.421**	.422**	.396**	.412**	.405**	-.327*	-.302*	-.282*	-.182	-.278

	Sig. (2-tailed)	.041	.025	.465	.058	.000	.012		.127	.020	.187	.001	.027	.002	.002	.004	.003	.003	.020	.033	.047	.205	.050
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
BAI_Total	Correlation Coefficient	.529**	.632**	.755**	.693**	.578**	.631**	.219	1.000	.722**	.478**	.193	.298*	.343*	.350*	.736**	.343*	.751**	-.555**	-.422**	-.366**	-.451**	-.367**	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.127		.000	.000	.204	.038	.090	.080	.000	.068	.000	.000	.002	.009	.001	.008	
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
BDI_Total	Correlation Coefficient	.391**	.596**	.539**	.576**	.711**	.656**	.329*	.722**	1.000	.369**	.402**	.536**	.416**	.521**	.706**	.304*	.589**	-.670**	-.523**	-.427**	-.452**	-.593**		
	Sig. (2-tailed)	.005	.000	.000	.000	.000	.000	.020	.000		.005	.002	.000	.003	.000	.000	.158	.000	.000	.000	.002	.001	.000	
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
PSYRATS_Total	Correlation Coefficient	.364**	.521**	.459**	.402**	.409**	.423**	.190	.478**	.369**	1.000	.079	.075	.142	.110	.542**	.090	.572**	-.328*	-.262	-.252	-.426**	-.249	
	Sig. (2-tailed)	.009	.000	.000	.000	.003	.002	.187	.000	.005		.584	.603	.326	.446	.000	.533	.000	.020	.066	.078	.002	.065	
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
CES_AP_Total	Correlation Coefficient	.239	.241	.159	.253	.414**	.367**	.452**	.193	.452**	.079	1.000	.738**	.831**	.912**	.395**	.250	.228	-.266	-.360*	-.165	-.258	-.226		
	Sig. (2-tailed)	.094	.092	.271	.076	.003	.009	.001	.204	.002	.584		.000	.000	.000	.001	.080	.111	.059	.013	.251	.073	.115	
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
CES_PI_Total	Correlation Coefficient	.322*	.266*	.176	.312*	.452**	.570**	.312*	.296*	.535**	.075	.738**	1.000	.673**	.893**	.406**	.144	.349*	-.507**	-.459**	-.349*	-.397**	-.479**		
	Sig. (2-tailed)	.023	.044	.221	.028	.001	.000	.027	.036	.000	.603	.000		.000	.000	.003	.320	.013	.000	.001	.013	.004	.000	
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
CES_TP_Total	Correlation Coefficient	.367**	.324*	.219	.356*	.391**	.341*	.421**	.243	.416**	.142	.831**	.673**	1.000	.816**	.324*	.226	.340*	-.369*	-.278	-.190	-.296*	-.216	
	Sig. (2-tailed)	.008	.022	.127	.011	.006	.015	.002	.090	.003	.326	.000	.000		.000	.022	.115	.016	.059	.051	.186	.037	.132	
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
CES_Total	Correlation Coefficient	.329*	.286*	.174	.313*	.461**	.476**	.422**	.250	.521**	.110	.912**	.893**	.816**	1.000	.367**	.210	.294*	-.380**	-.419**	-.275	-.367**	-.352*	
	Sig. (2-tailed)	.020	.044	.227	.027	.000	.000	.002	.080	.000	.446	.000	.000	.000		.009	.144	.038	.006	.002	.053	.009	.012	
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
FORSE_For_Total	Correlation Coefficient	.527**	.734**	.626**	.691**	.706**	.777**	.398**	.736**	.706**	.542**	.395**	.406**	.324*	.367**	1.000	.364**	.824**	-.625**	-.534**	-.535**	-.544**	-.569**	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.004	.000	.000	.000	.031	.003	.022	.009		.008	.000	.000	.000	.000	.000	.000	
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
FORSE_Aw_Total	Correlation Coefficient	.233	.395*	.231	.267	.249	.335*	.412**	.243	.204	.090	.250	.144	.226	.210	.364**	1.000	.303*	-.204	.066	.077	.025	-.053	
	Sig. (2-tailed)	.104	.039	.107	.061	.082	.017	.003	.088	.158	.533	.080	.320	.115	.144	.008		.033	.156	.646	.595	.863	.714	
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
FORSE_In_Total	Correlation Coefficient	.632**	.784**	.755**	.792**	.653**	.664**	.405**	.751**	.589**	.572**	.226	.349*	.340*	.294*	.824**	.303*	1.000	-.589**	-.583**	-.504**	-.579**	-.490**	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.003	.000	.000	.000	.111	.013	.016	.038	.000	.033		.000	.000	.000	.000	.000	
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50

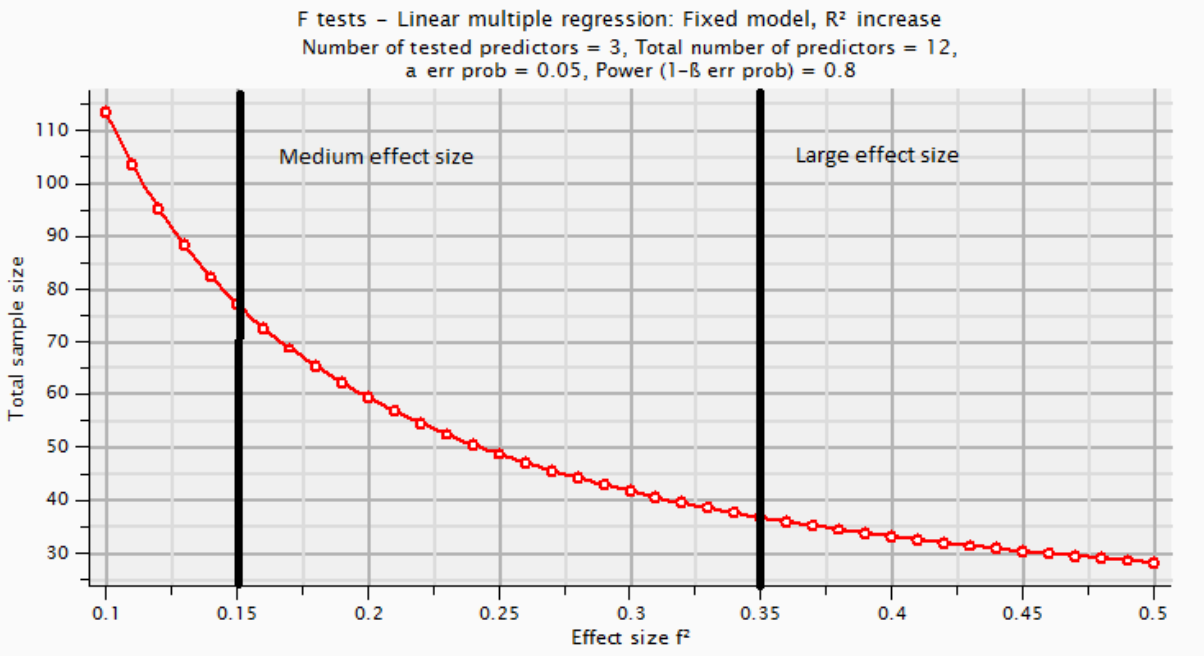
PBIQ_Shame_Total	Correlation Coefficient	-.481**	-.548**	-.535**	-.606**	-.666**	-.699**	-.327*	-.555**	-.670**	-.328*	-.268	-.507**	-.269	-.390**	-.625**	-.204	-.589**	1.000	.733**	.667**	.590**	.795**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.020	.000	.000	.020	.059	.000	.059	.006	.000	.156	.000		.000	.000	.000	.000
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
PBIQ_Loss_Total	Correlation Coefficient	-.484**	-.586**	-.487**	-.570**	-.653**	-.579**	-.302*	-.422**	-.523**	-.282	-.350*	-.469**	-.278	-.419**	-.534**	.066	-.560**	.733**	1.000	.833**	.650**	.765**
	Sig. (2-tailed)	.000	.000	.001	.000	.000	.000	.033	.002	.000	.066	.013	.001	.051	.002	.000	.648	.000	.000		.000	.000	.000
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
PBIQ_Entrap_Total	Correlation Coefficient	-.331*	-.491**	-.360*	-.441**	-.592**	-.502**	-.282*	-.366**	-.427**	-.252	-.185	-.349*	-.190	-.275	-.535**	.077	-.564**	.667**	.833**	1.000	.737**	.840**
	Sig. (2-tailed)	.019	.000	.010	.001	.000	.000	.047	.009	.002	.078	.251	.013	.186	.053	.000	.595	.000	.000	.000		.000	.000
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
PBIQ_Control_Total	Correlation Coefficient	-.316*	-.556**	-.452**	-.484**	-.559**	-.456**	-.182	-.451**	-.452**	-.426**	-.356*	-.397**	-.296*	-.367**	-.544**	.025	-.579**	.590**	.650**	.737**	1.000	.820**
	Sig. (2-tailed)	.026	.000	.001	.000	.000	.001	.205	.001	.001	.002	.073	.004	.037	.009	.000	.863	.000	.000	.000	.000		.000
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
PBIQ_SocMar_Total	Correlation Coefficient	-.299*	-.437**	-.335*	-.396**	-.643**	-.599**	-.278	-.387**	-.593**	-.248	-.228	-.479**	-.216	-.352*	-.569**	-.053	-.496**	.795**	.765**	.640**	.620**	1.000
	Sig. (2-tailed)	.049	.001	.017	.004	.000	.000	.050	.006	.000	.085	.115	.000	.132	.012	.000	.714	.000	.000	.000	.000	.000	
	N	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix 7: Power Analysis

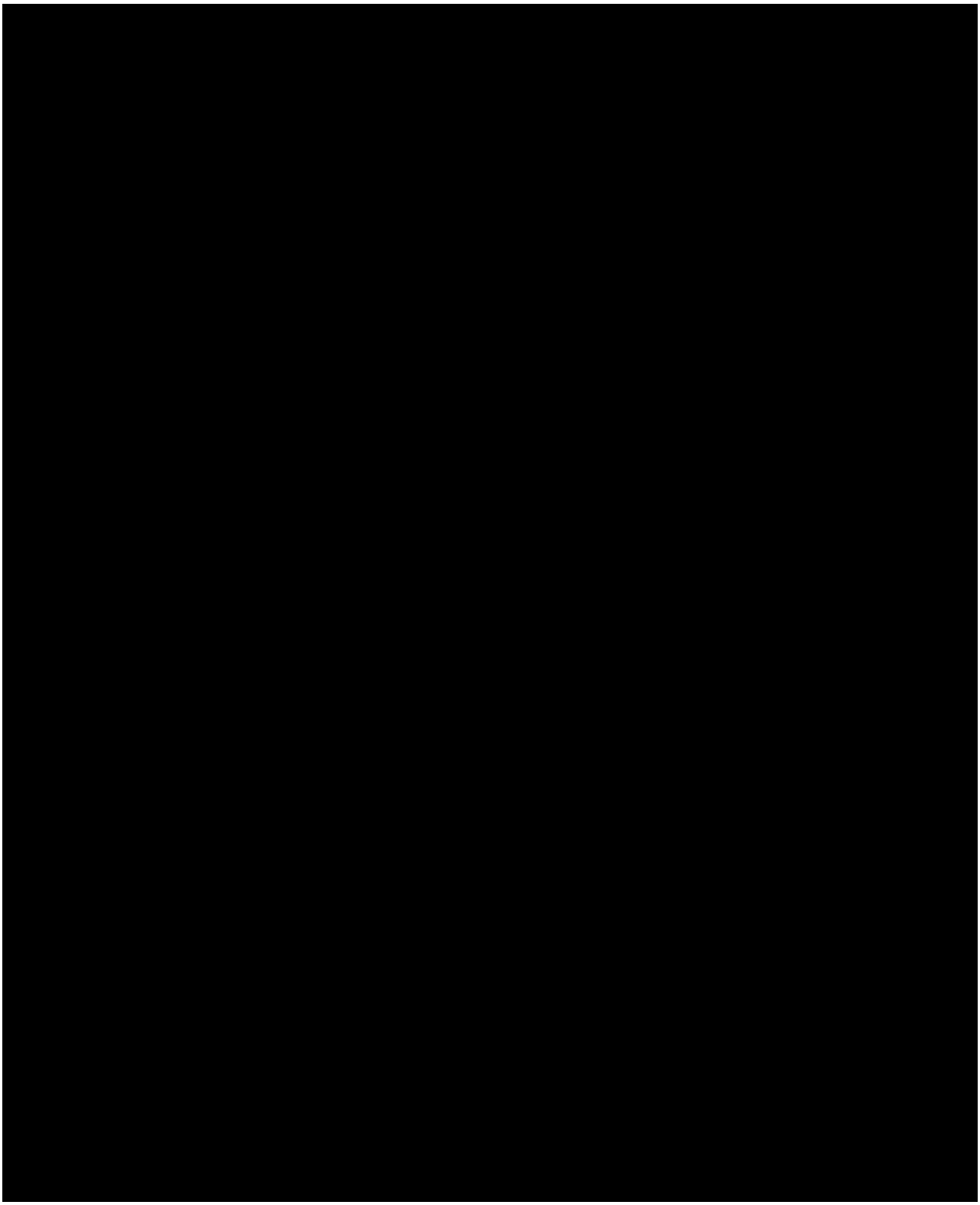
The power analysis is based upon a hierarchical multiple regression, in which twelve predictor variables are arranged into three blocks. The change in R^2 will be assessed upon the sequential inclusion of each of the blocks of predictor variables. The graph below describes the relationship between sample size and effects size for this analysis.



Using a post-hoc power calculation and Cohen's (1988) conventions for describing effect sizes as small, medium or large, the proposed study (with N = 50) would have a power of 0.8 with an effect size of 0.24 (medium effect size). In clinical practice small experimental effects may be of limited practical utility, with medium and large effect sizes representing robust clinical effects. Accordingly, a sample size of approximately 50 participants provides an acceptable balance between economy and clinical utility.

Cohen, J. (1988). Statistical Power Analysis for the Behavioural Sciences (2nd Ed). Hillsdale: New Jersey. Lawrence Erlbaum Associates.

Appendix 8: Journal Instructions for Publication



Appendix 9: Public Domain Briefing Document

Post-Psychotic Trauma: Contributory Factors and Interventions

This thesis was submitted as part of the Doctorate in Clinical Psychology at the School of Psychology, University of Birmingham. This document will describe Volume 1 that comprises of two parts; a review of the literature and a research or empirical study.

Literature review

Emotions such as fear, happiness and anger help us function on a daily basis. Emotions help guide our decisions, solve problems and help us to relate to people around us. Our parents or caregivers first provide us with emotional comfort when we are overwhelmed emotionally, such as being afraid of the dark. They also help us limit our emotional expression by setting boundaries for us, for example when we become angry or lose our temper. Overtime we learn to "bite our lip", "calm down", or be polite when the context demands this of us. This is the process of increasing or decreasing our emotions so that we function successfully within our environment. However, this process can get disrupted for many different reasons. In such cases, people can be afraid all the time, get angry very quickly and uncontrollably or rarely feel any happiness. Emotions can then become experiences to be avoided because they feel out of control, overwhelming or shameful. Why and how this process goes wrong is being studied now more carefully by researchers and clinicians. This is because the majority of mental health problems include problems with emotion. This is also the case for people with psychotic illnesses. Psychotic illnesses include schizophrenia, schizoaffective disorder, bipolar disorder and substance-related psychosis among other types. Symptoms of psychosis can include hearing voices, unusual beliefs and paranoid thoughts. But up to 68% of people with psychosis will have experienced an emotional disorder like depression before they become acutely psychotic, and most will experience anxiety, depression, shame or trauma after their psychosis. There is also a view that one pathway to psychosis is through emotional disorders like prolonged anxiety or depression. For this reason we carried out a review to see if people with psychosis have a hard time regulating their emotions because they are using strategies that are known to be less effective than other emotion regulation strategies. Indeed this is what research, though in its early phase, is beginning to show. People who suppress or push

down their emotional experiences, avoid them or find it hard to recognition or understanding their emotions tend to have more mental health problems than those who have learned to tolerate emotions, understand them and experience them as useful. This is especially so for people with psychosis, who also show a heightened sensitivity to negative emotions compared to people without psychosis. The research also suggests that using less helpful strategies like avoidance or suppression can actually lead to more emotional problems and inhibit functioning, especially in social environments, because problematic strategies require more effort and resources than alternative strategies. The hope therefore is that getting people with psychosis to learn new ways of responding to emotional experiences will allow them to improve their daily functioning and reduce their emotional distress. This research is only just in the beginning phase, so we also discuss the need for developments in research so more can be understood about this complicated process of emotion regulation.

Empirical paper

Background: A new idea about how an event such as illness, grief or trauma might impact on people's mental health and wellbeing has been suggested. The idea is based on the concept of *centrality*, the degree a traumatic event (e.g.: a road traffic accident) begins to influence how a person who experienced a traumatic event makes sense of their daily activities, how the traumatic event marks a turning point in their life and goes on to affects their sense of who they are as a person. The more the event influences their lives in this way, the more the event is considered central. Recent research has shown that an event that is very central is associated with more negative psychological consequences for that person following the traumatic event. These consequences could be greater likelihood of low mood or fear following the event and more intrusive memories of the event. Researchers have looked at centrality as applied to groups such as student, war veterans, and people experiencing grief, chronic pain and child abuse. In all cases where people report that these experiences are central to their lives, the more they report symptoms of low mood, anxiety and fear.

Experiencing a psychotic illness is highly disruptive to a person's life and can also result in lots of negative psychological consequences such as sadness, anxiety, shame and the re-experiencing of unpleasant memories related to the psychotic illness. Therefore, it is

necessary to explore whether people who had experienced a psychotic illness showed more symptoms of anxiety and depression following their illness if they viewed their psychotic illness as a highly central event in their lives. We also compared measures of centrality with the thoughts people had about their psychotic illness because these thoughts have been shown to be good predictors of whether people will experience more negative psychological consequences such as anxiety and depression following their illness.

Method: Fifty people who had recently experienced their first psychotic episode but who were no longer acutely unwell were asked to complete questionnaires about centrality on psychosis, and questionnaires assessing how often they re-experienced unpleasant memories of their illness, depression and anxiety as well as their current psychotic symptoms. They were also asked to complete questionnaires which examined how they thought about their illness and how they assessed the impact their illness had on their current life and their hopes for their future. These questionnaires were completed on a one-to-one basis with researchers and took between 30 to 60 minutes to complete.

Results: The results showed that people reported a psychotic illness to be a highly central event. That is, people felt their psychotic illness had influenced the way they made sense of daily events in their lives, had affected how they saw themselves as people and that the illness marked a significant turning point in their lives. These beliefs were found to be related to the number and level of low mood and re-experiencing of unpleasant memories about their illness. So to explain, people who reported that psychosis was a highly central event were more likely to experience feelings of hopelessness and unhappiness following their psychotic illness. However, the extent to which the psychotic illness had been central to their lives did not predict symptoms as well as their appraisals following their psychotic illness. These appraisals included their hopes for their future, their beliefs about what other people think about them and beliefs they hold about themselves as valuable members of society.

Conclusions: The degree psychosis was reported as a central life event was related to the level of low mood following their illness. However, finding out what thoughts and beliefs people have about themselves, their future and what others think of them after they have had a psychotic illness is a better predictor of whether they will require additional help in dealing with post-illness memories, low mood and anxiety compared to measuring the degree of centrality they place on their illness.