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The Role of Schemas in Psychosis and Voice-Hearing

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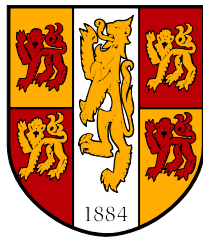
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The Role of Schemas in Psychosis and Voice-Hearing

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PRIFYSGOL
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Submitted in partial fulfilment for the degree of

Doctorate in Clinical Psychology

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¹Note that questionnaires used for the purpose of this thesis are not included as appendices due to copyright laws.

Declaration

I hereby declare that this thesis is the results of my own investigations, except where otherwise stated. All other sources are acknowledged by bibliographic references. This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree unless, as agreed by the University, for approved dual awards.

Signed:

Date:

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Thesis Abstract

The first chapter consists of a systematic literature review, which asks the research question: what does the literature to date tell us about schemas in psychosis and at-risk populations? A systematic search identified a total of 23 studies that met the inclusion criteria. Negative schema were elevated across the continuum of clinical psychotic groups, but were not characteristic of non-clinical samples having psychotic like experiences. Associations were found between schemas and a range of psychotic symptomology in clinical groups. There was preliminary evidence suggesting schemas may partially mediate the relationship between trauma and psychotic symptoms, lending support to cognitive models of psychosis. One intervention study showed the potential benefits of targeting underlying self-schema. Firm conclusions cannot be drawn at this time as the majority of studies employed a cross-sectional design.

The second chapter examines the empirical research investigating associations between schemas and beliefs about voices, and the relationship between the hearer and their voice. A total of 44 voice-hearing participants completed questionnaires assessing schemas, beliefs about voices, and the perceived relationship with their voice. A clinician rating scale assessed different dimensions of their voice-hearing experience. Beliefs about voices correlated with negative voice content and schemas. After controlling for negative voice content, schemas were estimated to predict 1-17% of the variance in the six beliefs about voices; three of the associations reached statistical significance. Schemas also correlated with dimensions of relating between the hearer and their voice. This study provides evidence that schemas may be important when considering beliefs about voices and the perceived relationship between the hearer and their voice.

The third chapter discusses the implications for theory development, clinical practice, and future research, arising from the first two papers. A reflective commentary is provided at the close of the thesis.

Chapter 1: Literature Review

What does the literature to date tell us about Schemas in Psychosis and At-Risk Populations?

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This paper will be submitted to *Clinical Psychology and Psychotherapy* and as such will follow submission guidelines for the journal:

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Abstract

Background: Cognitive models of psychosis propose that early adversity may create an enduring cognitive vulnerability, characterised by negative maladaptive schemas about the self and others. The role of underlying schema in the onset and maintenance of specific psychotic symptomatology is emphasised within these models.

Aim: To systematically review, synthesise, and evaluate the current evidence that suggests a link between schemas and psychosis. The research question asks: what does the literature to date tell us about schemas in psychosis and at-risk populations?

Method: Searches were conducted using the PsycInfo, Medline, and Web of Science databases. Titles were screened and abstracts were examined to identify studies to include for review, based on the specified inclusion and exclusion criteria.

Results: The search resulted in 23 studies included for review. Negative schema were elevated across the continuum of psychosis, including at-risk groups seeking help for their experiences. Non-clinical samples having psychotic like experiences however, had significantly lower negative schema than clinical groups. Associations were found between schemas and a range of psychotic symptomatology in psychosis and at-risk groups. Preliminary evidence suggested that schemas may partially mediate the relationship between trauma and psychotic symptoms. One intervention study showed the potential benefits of targeting underlying self-schema.

Conclusion: Firm conclusions cannot be drawn as the majority of studies employ a cross-sectional design, however the literature to date offers support to the cognitive models of psychosis. Suggestions for future research and clinical implications are discussed.

Keywords: Psychosis, at-risk, clinical, cognitive, schema, maladaptive

Key Practitioner Message

- Psychotic and at-risk help-seeking groups have significantly elevated negative schema and fewer positive schema, in comparison to control groups reporting no psychotic experiences.
- Underlying schema do not appear to differ across psychotic and at-risk groups, however non-clinical samples with psychotic-like experiences have fewer negative schemas and elevated positive schemas.
- A range of associations were found suggesting that specific positive psychotic symptoms may reflect distinct underlying schema.
- Although such research is in its infancy, there is preliminary evidence to suggest that it is possible to alter underlying schema targeted through a cognitive-behavioural therapy intervention.
- It may be beneficial to consider assessing for schemas in clinical practice and incorporating them into individualised formulations.

Introduction

Psychosis can be defined as a mental health problem that causes people to perceive or interpret things differently from others (National Health Service [NHS] Choices, 2016).

Symptoms are typically divided into two subtypes: positive symptoms, which include hallucinations and delusions; and negative symptoms, which include emotional apathy, lack of drive, poverty of speech, social-withdrawal, and self-neglect (National Institute for Health and Care Excellence [NICE], 2014). There is evidence to suggest that psychotic symptoms are part of a continuum of experiences and such experiences are widely reported in the general population (Peters et al., 2016).

The at-risk mental state (ARMS) has been defined as the prodromal period before the onset of psychosis, and is conceptualised along the psychosis continuum. ARMS is defined by attenuated positive symptoms and reduced functioning below the threshold of a developed psychosis (McGlashan, Walsh, & Woods, 2010; Yung et al., 2005). Some individuals classified as ARMS do not go on to develop psychosis and of those, some remain symptomatic over time and others become symptom free (Addington et al., 2011).

Cognitive models of psychosis propose that early adverse experiences such as abuse, neglect, and criticism, may create an enduring cognitive vulnerability characterised by negative maladaptive schemas (Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001; Garety, Bebbington, Fowler, Freeman, & Kuipers, 2007). Such 'early maladaptive schema' (EMS) are defined as cognitive structures characterised by long-standing negative beliefs regarding oneself, others, and the world (Young, 1990). The cognitive model suggests that negative schema can contribute to the formation and maintenance of positive psychotic symptoms (Garety et al., 2001) and therefore, schemas may be conceptualised as one of the connections between past experiences and later psychotic experiences. The model proposes that psychotic beliefs are likely to be held more firmly if they are consistent with underlying

schema, and once a psychotic belief is formed, it is likely to be considered as confirmation of the individuals' schemas. Cognitive models also suggest that negative schema play a role in the expression and persistence of negative symptoms (Rector, Beck, & Stolar, 2005). The model proposes that negative symptoms are driven by perceptions of limited psychological resources, negative social and performance attitudes, and low expectations for success.

The threat anticipation model (Freeman, Garety, Kuipers, Fowler, & Bebbington, 2002; Freeman, 2007; Freeman & Garety, 2004) proposes that individuals search to understand their unusual experience by drawing upon pre-existing schema. The model suggests that a persecutory belief is likely to be formed if individuals have negative schemas, which influence and reflect the content of the delusion and therefore, confirm their schemas. Models of grandiose delusions suggest delusions arise as a defence against low self-esteem, a sense of loneliness, and worthlessness (Beck & Rector, 2005), whereas emotion consistent accounts suggest grandiose delusions are built upon positive beliefs that become exaggerated (Smith, Freeman, & Kuipers, 2005).

A widely used questionnaire measure to assess for schemas in psychosis is the Brief Core Schema Scales (BCSS), which is validated for use with psychotic and at-risk populations (Fowler et al., 2006; Addington & Tran, 2009). Items on the BCSS operationalise schemas by specifically addressing negative and positive self and other schema. Although less widely used with these populations, the Young Schema Questionnaire Short-Form (YSQ-SF; Young, 1998) assesses the manifestation of 15 EMS. Although both intend to measure schema, the measures conceptualise schema differently and therefore may find different results. Fowler et al. (2006) assessed concurrent validity between the measures and found moderate to strong associations between the BCSS and the YSQ-SF defectiveness/shame, mistrust/abuse and social isolation schemas. Very low associations however were reported between the BCSS and the YSQ-SF failure and self-sacrifice schemas.

Although cognitive models consider underlying schema a key cognitive process in psychosis, there has been no systematic review completed on this topic. The main aim of this review is to systematically review, synthesise, and evaluate the current research that explore links between schemas and psychotic disorders. The research question is broad and asks: what does the literature to date tell us about schemas in psychosis and at-risk populations?

Method

Search Strategy

Three electronic databases were searched (PsycInfo, Medline, and Web of Science) with no date range restrictions applied. Restrictions placed upon the search criteria included English language and peer-reviewed publications, using the following terms: (psychosis OR psychoses OR thought disorder OR schiz* OR halluc* OR paran* or delus* OR psychotic OR voice OR voice* OR voice hearing OR voice-hearing OR auditory verbal hallucination* OR auditory hallucination* OR hearing voice* OR at-risk mental state) AND (schema OR core belief OR early maladaptive schema* OR maladaptive schema* OR EMS OR schema mode). This resulted in 1488 publications. Two reviewers independently examined abstracts of these articles and in cases of uncertainty over the inclusion of an article, method and results sections were reviewed until a consensus on articles to include was reached. Reference lists of selected articles were also searched and relevant titles to be screened for inclusion were identified. The process for selecting publications was based upon the Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines (PRISMA; Moher, Liberati, Tetzlaff, & Altman, 2009). A flow diagram depicting the study review process is given in Figure 1.

Eligibility Criteria

Studies were included based on the following criteria: [1] a primary sample of participants reporting psychotic experiences were recruited; [2] the sample mean age was over 18; [3] a validated measure of psychotic symptoms and schemas were employed; and [4] the study employed quantitative methodology. Exclusion criteria included: [1] a main focus on other primary symptoms or topic; [2] studies developing a scale or questionnaire; and [3] studies employing measures assessing core beliefs, self-esteem, self-worth, or personality styles, rather than schemas.

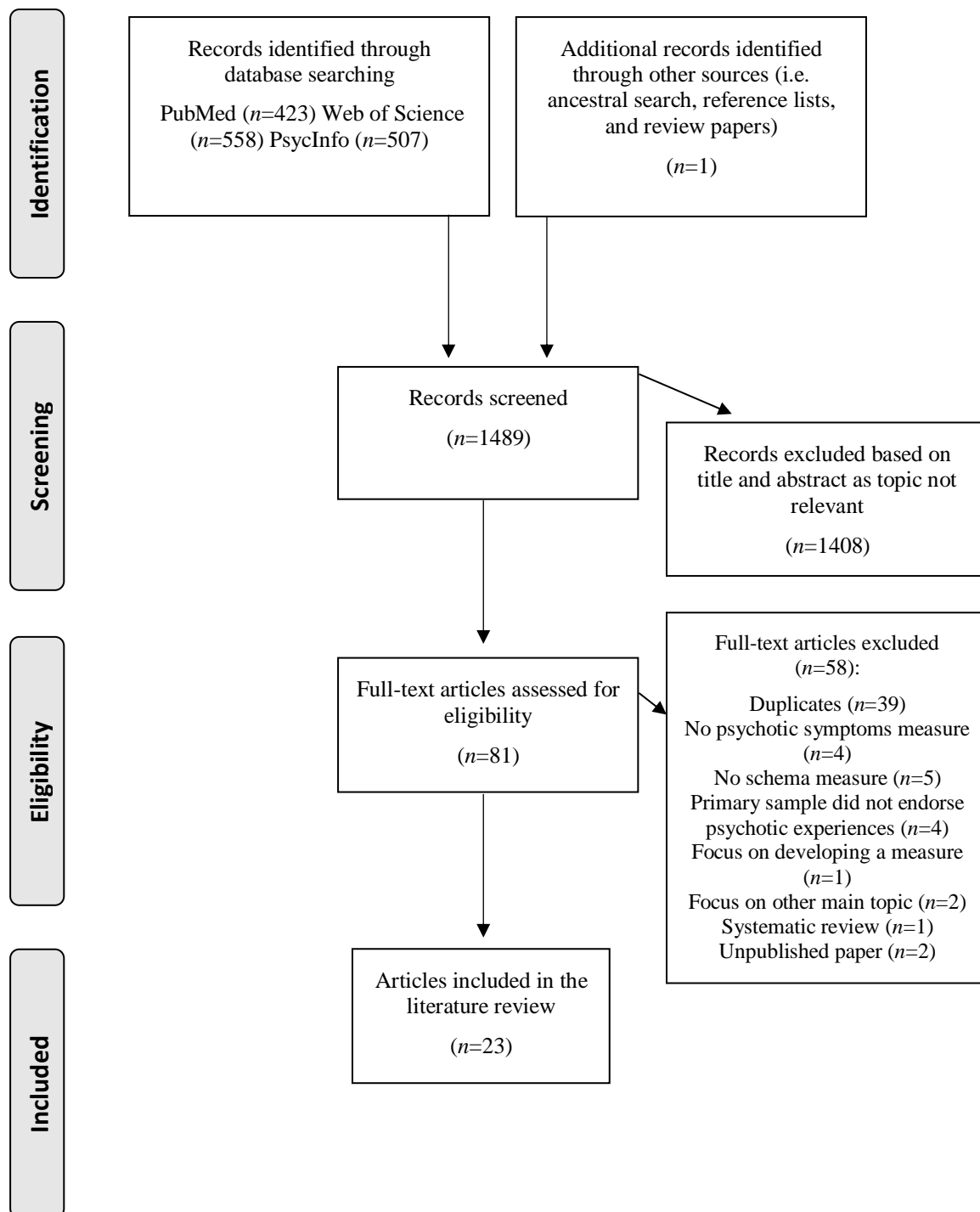


Figure 1. PRISMA flow diagram showing the literature search process (Moher et al., 2009)

Results

The search process identified 23 studies. Data relevant to the research question were extracted (see Table 1). Findings were organised into overarching categories that emerged through the data extraction process. This process highlighted important sub-questions and the sections below narratively synthesise the research findings under each sub-question.

Table 1

Demographics and Key Findings of the Reviewed Studies

Citation & Country	Study Design	Sample Size & Clinical Characteristics	Schema Measure	Key Findings
Smith et al. (2006) UK	Cross-sectional	<i>Clinical group: N=100 (69 male), M_{age}=39; 78% diagnosed with schizophrenia, 20% schizoaffective disorder, and 2% delusional disorder.</i>	BCSS (negative subscales only)	<i>Negative-Self Schema:</i> Negative association with grandiose delusions. Independent and positive association with persecutory delusions. Associated with higher levels of preoccupation and distress by delusions. <i>Negative-Other Schema:</i> Associated with total positive psychotic symptoms. Independent and positive association with grandiose delusions.
MacKinnon, Newman-Taylor, & Stopa (2011) UK	Cross-sectional, case-control	<i>Clinical group: N=16 (14 male) experiencing persecutory delusions, M_{age}=41.69; 88% diagnosed with schizophrenia, 6% schizoaffective disorder, and 6% psychotic mood disorder. Control group: N=20 HC (8 male), M_{age}=29.5.</i>	BCSS	<i>Negative-Self and Other-Schema:</i> Clinical group reported > negative-self and negative-other schema than HC. Ns group differences for negative-self schema when controlling for emotional symptoms (i.e. depression, anxiety, and stress). <i>Positive-Self and Other-Schema:</i> Ns group differences.
Stowkowy & Addington (2012) Canada	Cross-sectional, case-control	<i>Clinical group: N=38 (28 male) at CHR of developing psychosis, M_{age}=19.7. Control group: N=23 age-matched HC (gender NR).</i>	BCSS (negative subscales only)	<i>Negative-Self and Other-Schema:</i> Negative schemas† correlated with positive psychotic symptoms and social defeat in the clinical group, before and after controlling for depression. Compared to HC the clinical group reported a > total negative schema score. Negative schemas mediated the relationship between social defeat and psychosis.
Freeman et al. (2012) UK	Cross-sectional	<i>Clinical group: N=130 (82 males), M_{age}=41.1; 85% diagnosed with schizophrenia, 5% delusional disorder, 7% schizoaffective disorder, and 1% psychotic disorder.</i>	BCSS (negative subscales only)	<i>Negative-Self Schema:</i> Associated with > levels of paranoia; ns when controlling for anxiety and depression.
Garety et al. (2013) UK	Cross-sectional, case-control	<i>Clinical group: N=301 (201 male), M_{age}=37.6; 85% diagnosed with schizophrenia, 13% schizoaffective disorder, and 2% delusional disorder. Further divided into delusional subtype groups (i.e. persecutory delusions, grandiose delusions, both, neither [N=280]).</i>	BCSS	<i>Negative-Self and Other-Schema:</i> > Negative-self schema predicted an increased chance of persecutory delusions. Ns > negative-other schema predicted an increased chance of persecutory delusions. < Negative-self schema predicted an increased chance of grandiose delusions. <i>Positive-Self and Other-Schema:</i> > Positive-self and other-schema predicted an increased chance of grandiose delusions.

Citation & Country	Study Design	Sample Size & Clinical Characteristics	Schema Measure	Key Findings
Bortolon, Capdevielle, Boulenger, Gely-Nargeot, & Raffard (2013) France	Cross-sectional, case-control	<i>Clinical group:</i> N=48 (32 male) diagnosed with schizophrenia, M _{age} =37.04. <i>Control group:</i> N=44 (28 male) HC matched by age, gender, and education, M _{age} =36.95.	YSQ-SF	Clinical group reported > scores on six maladaptive schema subscales after controlling for depression, than the HC group. Six maladaptive schema subscales were associated with total positive symptoms in the clinical group. When controlling for depression only the mistrust/abuse schema remained significant.
Chung et al. (2013) Korea	Cross-sectional, case-control	<i>Recovery group:</i> N=34 (15 male), M _{age} =33.59. Symptom remission and adequate socio-occupational functioning for >1 year. <i>Remission group:</i> N=24 (16 male), M _{age} =38.54. Symptom remission for >6 months. All diagnosed with schizophrenia, schizophreniform disorder, or schizoaffective disorder.	BCSS	<i>Negative-Self and Other-Schema:</i> Ns group differences. <i>Positive-Self and Other-Schema:</i> Recovered group reported significantly > scores for positive-self schema than the remission group. Recovered group reported ns > scores for positive-other schema than the remission group.
Addington et al. (2013) USA, Canada	Cross-sectional, case-control	<i>Clinical group:</i> N=360 (210 male) at CHR of developing psychosis, M _{age} =18.98. <i>Control group:</i> N=180 HC (100 male), M _{age} =19.54.	BCSS (negative subscales only)	<i>Negative-Self and Other-Schema:</i> Negative-self and other-schema correlated with all trauma types in the clinical group.
Taylor et al. (2014) UK	Cross-sectional, case-control	<i>Clinical group 1:</i> N=20 (74% male), experiencing FEP, M _{age} =22.4. <i>Clinical group 2:</i> N=113 (59% male), identified as ARMS, M _{age} =20.4. <i>Clinical group 3:</i> N=28 (82% male), HSC participants with no history of psychosis and below the threshold for ARMS, M _{age} =21.3. <i>Non-clinical group:</i> N=30 (27% male), non-help seeking participants having psychotic like experiences, M _{age} =22.8.	BCSS	<i>Negative-Self Schema:</i> Non-clinical group scored < than FEP, ARMS, and HSC groups. Ns differences between FEP, ARMS and HSC groups. Correlated with a range of severity [UTC; NBI; and DS] and distress [NBI] ratings of positive psychotic symptoms. <i>Negative-Other Schema:</i> Non-help seeking group scored < than FEP, ARMS, and HSC groups. Ns differences between FEP, ARMS, and HSC. Correlated with a range of severity [UTC; PA; and DS], and distress [NBI and PA] ratings of positive psychotic symptoms. <i>Positive-Self Schema:</i> Non-help seeking group scored > than ARMS and HSC. Ns correlations with severity or distress ratings of positive psychotic symptoms. <i>Positive-Other Schema:</i> Ns group differences. Ns correlations with severity or distress ratings of positive psychotic symptoms.

Citation & Country	Study Design	Sample Size & Clinical Characteristics	Schema Measure	Key Findings
Saleem et al. (2014) USA/Canada	Cross-sectional, case-control	<i>Clinical group: N=360 (211 male) at CHR of developing psychosis, M_{age}=18.99.</i> <i>Control group: N=180 age-matched HC (87 male), M_{age}=19.54.</i>	BCSS (negative subscales only)	<i>Negative-Self and Other-Schema:</i> Clinical group reported > negative schemas† than HC. Ns correlation between negative schemas and individual or total attenuated (subclinical) positive symptoms in clinical group. Perceived discrimination was associated with negative schemas in both groups.
Freeman et al. (2014) UK	RCT	Participants experiencing persecutory delusions, diagnosed with schizophrenia, schizoaffective disorder, delusional, or psychosis not otherwise specified, were randomised to: <i>Treatment group: N=15 (11 male), M_{age}=41.9, received six CBT intervention sessions designed to target self-schema, and standard care.</i> <i>Control group: N=15 (9 male), M_{age}=41.5 received standard care only.</i>	BCSS	<i>Negative-Self Schema:</i> Ns reduction in the treatment group immediately post-treatment. <i>Positive-Self Schema:</i> Significant improvements in the treatment group immediately post-treatment. No longer-term treatment benefits were observed at the one-month follow up.
Thomas, Farhall, & Shawyer (2015) Australia	Cross-sectional	<i>Clinical group: N=34 (22 male), M_{age}=35.4, experiencing auditory verbal hallucinations in the form of voices, diagnosed with schizophrenia or schizoaffective disorder.</i>	BCSS	<i>Negative-Self and Other-Schema:</i> Negative-self schema correlated with malevolence, omnipotence, metaphysical, and loss of control beliefs about voices. Negative-other schema correlated with malevolence and loss of control beliefs about voices. Negative-self schema was the strongest predictor of beliefs about voices. <i>Positive-Self and Other-Schema:</i> Positive-self schema correlated with positive beliefs about voices. Ns associations between positive-other schema and beliefs about voices.
Morrison et al. (2015) UK	Cross-sectional	<i>Clinical group: N=117 (72 male) identified as ARMS, M_{age}=20.3.</i>	BCSS (negative subscales only)	<i>Negative-Self Schema:</i> Ns association with paranoia. Positive association with deservedness of persecution. <i>Negative-Other Schema:</i> Positive association with paranoia. Negative association with deservedness of persecution.
Sundag, Ascone, de Matos Marques, Moritz, & Lincoln (2016) Germany	Cross-sectional, case-control	<i>Clinical group: N=81 (38 male) diagnosed with psychotic disorder, M_{age}=40.86.</i> <i>Clinical group 2: N=28 (15 male) diagnosed with depression, M_{age}=41.71.</i> <i>Control group: N=60 (29 male) HC, M_{age}=38.43.</i>	YSQ-SF	In the psychotic clinical group, the number of EMS and total EMS score predicted the severity of positive psychotic symptoms. Ns associations between EMS and the severity of negative symptoms of psychosis in the psychotic clinical group. Ns differences for number and intensity of EMS between the clinical psychotic group and clinical depression group. Both clinical groups showed > total EMS score and higher overall number of EMS than HC.

Citation & Country	Study Design	Sample Size & Clinical Characteristics	Schema Measure	Key Findings
Collett, Pugh, Waite, & Freeman (2016) UK	Cross-sectional, case-control	<i>Clinical group:</i> N=21 (10 male) experiencing persecutory delusions and diagnosed with non-affective psychosis, $M_{age}=45.6$. <i>Control group:</i> N=21 (10 male) HC matched by age and gender, $M_{age}=41.9$.	BCSS	<i>Negative-Self Schema:</i> Clinical group reported > than HC. Significantly associated with suicidal ideation in the clinical group. <i>Positive-Self Schema:</i> Clinical group reported < than HC.
Stowkowy et al. (2016) USA/Canada	Case-control, longitudinal	<i>Clinical group:</i> N=765 (436 male) at CHR of developing psychosis, $M_{age}=18.47$. <i>Control group:</i> N=280 (141 male) HC, $M_{age}=19.65$. A sub-sample of individuals ($n=556$ CHR, $n=246$ HC) who had completed a 2-year follow-up were divided into 1/4 groups based on clinical status.	BCSS	<i>Negative-Self and Other-Schema:</i> Clinical group > negative-self schema than HC across all time points (i.e. baseline, 6 month and 12 month) when controlling for depression. Negative-other schema was associated with total positive psychotic symptoms in the clinical group. Those who transitioned to psychosis had > negative-self schema at the time of transition than those who did not transition. There were no differences at baseline. <i>Positive-Self and Other-Schema:</i> Clinical group < than HC. No association with symptoms of psychosis.
Hardy et al. (2016) UK	Cross-sectional	<i>Clinical group:</i> N=228 (165 male), $M_{age}=38.24$; 86% diagnosed with schizophrenia, 13% schizoaffective disorder, and 2% delusional disorder.	BCSS (negative subscales only)	<i>Negative-Self and Other-Schema:</i> Negative-self schema were not associated with trauma types. Childhood sexual, physical, and emotional abuse were associated with > negative-other schema. Childhood emotional abuse was associated with persecutory delusions which was partially mediated by negative-other schema.
Peters et al. (2016) UK	Cross-sectional, case-control	<i>Clinical group:</i> N=84 (55 male), experiencing positive symptoms and diagnosed with a psychotic disorder, $M_{age}=42$. <i>Non-clinical group:</i> N=92 (25 male), healthy individuals with enduring psychotic experiences, $M_{age}=46$. <i>Control group:</i> N=83 (26 male) matched to non-clinical group, $M_{age}=46$.	BCSS	<i>Negative-self and Other-Schema:</i> The clinical group reported > than the non-clinical and control groups. Ns differences between non-clinical and control groups. <i>Positive-Self and Other-Schema:</i> The control and non-clinical groups reported > than the clinical group. Ns differences between non-clinical and control groups.
Appiah-Kusi et al. (2017) UK	Cross-sectional, case-control	<i>Clinical group:</i> N=30 (16 male) at UHR of developing psychosis, $M_{age}=23.93$. <i>Control group:</i> N=38 (18 male) age and gender matched HC, $M_{age}=26.14$.	BCSS	<i>Negative-Self and Other-Schema:</i> Clinical group reported > negative-self schema and ns > negative-other schema than HC. Negative-self schema was associated with UHR status. Negative-self schema partially mediated the relationship between childhood emotional neglect and UHR paranoia, and psychosis. <i>Positive-Self and Other-Schema:</i> Clinical group reported < than HC.

Citation & Country	Study Design	Sample Size & Clinical Characteristics	Schema Measure	Key Findings
Müller et al. (2017) Germany	Cross-sectional, case-control	<i>Clinical group 1: N=137 (92 male) at CHR of developing psychosis, M_{age}=25.1. This group were later divided into sub-classes according to risk of transition to psychosis: Risk Class-I (n=4); Risk-Class-II (n=29); Risk-Class-III (n=67); Risk-Class-IV (n=31).</i> <i>Clinical group 2: N=211 (128 male), M_{age}=37.5, participants experiencing persistent positive symptoms, diagnosed with a schizophrenia spectrum disorder.</i>	BCSS	<i>Negative-Self and Other-Schema:</i> Associated with persecution in both clinical groups. Negative-self schema were associated with paranoid ideation in CHR and a lower risk state. Negative-other schema were associated with the highest risk state and fully developed psychosis. <i>Positive-Self and Other-Schema:</i> Positive-other schema was associated with persecution in clinical group 1. Positive-self schema > in clinical group 2.
Sundag, Ascone, & Lincoln (2017) Germany	Cross-sectional, case-control	<i>Clinical group: N=20 (8 male) experiencing persecutory delusions diagnosed with a psychotic disorder, M_{age}=38.70.</i> <i>Control group: N=40 (13 male) HC, M_{age}=40.03.</i>	YSQ-SF	Clinical group > paranoia following social stress induction, which was accounted for by > EMS total scores. The defectiveness/shame and enmeshment/undeveloped self-schemas were associated with an increase in paranoia.
Cowan, McAdams, & Mittal (2018) USA	Cross-sectional, case-control	<i>Clinical group: N=73 (44 male) at UHR of developing psychosis, M_{age}=18.7.</i> <i>Control group: N=73 (32 male) matched HC M_{age}=18.1.</i>	BCSS	<i>Negative-Self and Other-Schema:</i> Clinical group reported > than HC. In the clinical group, negative-self schema predicted negative attenuated psychotic symptoms but not positive symptoms. <i>Positive-Self and Other-Schema</i> Clinical group reported < than HC. < Positive-self schema predicted negative attenuated psychotic symptoms.
Khosravani, Mohammadzadeh, & Oskouyi (2019) Iran	Cross-sectional, case-control	<i>Clinical group: N=105 (43 male) diagnosed with schizophrenia, M_{age}=32.99.</i> <i>Non-clinical group: N=90 (30 male) with high-schizotypal traits, M_{age}=18.67.</i> <i>Non-clinical group 2: N=90 (36 male) with low-schizotypal traits, M_{age}=18.97.</i>	YSQ-SF	The clinical group and non-clinical high-schizotypal trait group had > EMS scores than the non-clinical low-schizotypal trait group; ns difference between the clinical and non-clinical high-schizotypal trait group. All but four schemas related to positive psychotic symptoms in the clinical group and the social isolation, defectiveness and vulnerability to harm schemas were associated with negative psychotic symptoms in the clinical group; these associations remained when controlling for depression. The mistrust/abuse schema predicted positive psychotic symptoms and the social isolation schema predicted negative symptoms in the clinical group.

Note. N=number of participants, M_{age}=mean age, NR=not reported, >=higher/more than, <=fewer/less than, ns=non-significant, RCT=Randomised Controlled Trial, HC=Healthy Controls, HSC=Help-Seeking Clinical, FEP=First Episode Psychosis, ARMS=At Risk Mental State, CHR=Clinical High Risk, UHR=Ultra-High Risk, BCSS=Brief Core Schema Scales, YSQ-SF=Young Schema Questionnaire – Short Form, EMS=Early Maladaptive Schema, UTC=unusual thought content, NBI=non-bizarre ideas, DS=disorganized speech, PA=perceptual abnormalities, CBT=cognitive-behavioural therapy. †A total schema score was computed.

Does Schema Functioning Differentiate Clinical Groups from Non-Clinical Controls?

Three studies compared self and other-schema between clinical psychosis groups and non-clinical controls. Psychosis groups were consistently characterised by elevated negative-self and other-schema, and fewer positive-self and other-schema (Collett, Pugh, Waite, & Freeman, 2016; Peters et al., 2016). One study however, found that elevated negative-self schema were partly accounted for by the presence of depression and found no differences between groups in positive-schema scores (MacKinnon, Newman-Taylor, & Stopa, 2011). Some of these studies are limited by small samples with disparities across the samples (i.e. age and gender unevenly matched). Although there are some inconsistencies across findings, initial evidence suggests that schemas differentiate clinical psychosis groups from non-clinical controls.

Five studies explored schema differences between clinical at-risk (this includes those defined by researchers as ARMS, ultra-high risk, or at clinical high-risk of developing psychosis) and healthy control (HC) groups. Overall, findings are relatively consistent and sample sizes ranged from modest to large, making findings more robust. Results suggest that elevated negative-self and other-schema differentiate at-risk groups from HCs (Saleem et al., 2014; Appiah-Kusi et al., 2017), and this finding remained when controlling for depression (Stowkowy & Addington, 2012; Stowkowy et al., 2016). Research also indicates that at-risk groups endorse fewer positive-self and other-schema than HCs (Cowan, McAdams, & Mittal, 2018; Stowkowy et al., 2016; Appiah-Kusi et al., 2017).

Three studies compared EMS measured by the YSQ-SF across clinical psychosis and non-clinical HC groups (Bortolon, Capdevielle, Boulenger, Gely-Nargeot, & Raffard, 2013; Sundag, Ascone, de Matos Marques, Moritz, & Lincoln, 2016; Sundag et al., 2017). A greater presence of EMS were characteristic of the psychosis groups. One study controlled for depression and identified six EMS that remained statistically different from the HC group:

Emotional deprivation, social isolation, defectiveness/shame, enmeshment, failure, and subjugation schemas (Bortolon et al., 2013). These precise EMS may therefore be pertinent in differentiating clinical psychosis and non-clinical HC groups.

Does Schema Functioning Differ Across the Psychosis Continuum?

Four groups across the psychosis continuum were compared by Taylor et al. (2014): (1) FEP; (2) ARMS; (3) help-seeking clinical below the ARMS threshold; and (4) non-help-seeking (i.e. non-clinical) psychotic-like experiences (PLEs). Negative-self and other-schema did not differentiate the three clinical groups, whereas the non-help-seeking PLEs group were characterised by significantly fewer negative-schemas than all clinical groups. Similarly, Peters et al. (2016) found that a clinical psychosis group reported significantly elevated negative-self and other-schema than a non-help-seeking PLEs group, however, there were non-significant differences between the non-help-seeking PLEs group and a control group. In line with Taylor and colleagues, later research found no significant differences in negative schemas between an at-risk and psychosis sample (Müller et al., 2017). Collectively, these findings suggest that non-clinical PLEs groups are characterised by significantly fewer negative-self and other-schema than clinical psychosis groups. The findings did not reflect any distinct schema dependent upon stage of psychosis however, and are supportive of negative schema being characteristic of all clinical groups (i.e. psychosis, FEP, at-risk and help-seeking below ARMS threshold). Limitations of these studies include a large disparity between sample sizes resulting in some samples underpowered to detect small effects.

The continuum view of psychosis proposes that psychotic symptoms are the severe expression of schizotypal traits that are normally distributed in the general population (Peters et al., 2016). One study found no differences in EMS between a clinical psychosis and high-schizotypal trait non-clinical group, however these groups endorsed significantly more EMS

than a low-schizotypal trait non-clinical group (Khosravani, Mohammadzadeh, & Oskouyi, 2019). This suggests that as schizotypal traits increase, negative schemas increase.

Whilst cross-sectional studies suggest that schema functioning appears independent of stage of clinical psychosis, other studies have indicated changes in schemas across time, although results are strikingly inconsistent. Research with a large clinical sample ($N=765$) found that negative-self schema increase at the time of transition to psychosis, suggesting that those individuals potentially felt worse about themselves during transition (Stowkowy et al., 2016). In contrast, Müller et al. (2017) stratified an at-risk sample into sub-samples based on their level of risk of transitioning to psychosis. Findings suggest that the transition to psychosis was associated with a switch from predominantly negative-self to negative-other schemas, specifically in association with paranoid ideation. The instability of these schemas during transitional phases therefore might be an important area to research further using longitudinal designs.

Research regarding the role of positive schemas across the continuum is limited and unclear, making it difficult to confidently draw conclusions. Increased positive-self schema has been found to characterise a FEP clinical group; however, researchers speculated this may have been underpinned by elevated levels of grandiosity (Taylor et al., 2014). Other research found a clinical psychosis group held significantly more positive-self schema than an at-risk group (Müller et al., 2017). Although it is possible that these clinical groups were experiencing grandiosity, neither studies measured grandiose symptoms. Findings are inconclusive, but possibly suggest that positive-self schema are elevated in psychosis groups compared to at-risk groups. One study with large sample sizes found that positive-self and other-schema were significantly elevated in a non-clinical PLEs group ($n=92$) compared to a clinical psychosis group ($n=84$; Peters et al., 2016). These findings provide preliminary

evidence to suggest that positive schemas are characteristic of non-help-seeking individuals experiencing PLEs.

Other research has found that individuals who had recovered from psychosis (i.e. had achieved symptom remission and adequate socio-occupational functioning for more than one year) had increased positive-self schema compared to a remitted group (i.e. symptom remission for more than six months and inadequate socio-occupational functioning recovery; Chung et al., 2013). Focusing on increasing positive-self schema may therefore be an important clinical target in helping those in remission achieve recovery. These preliminary findings however are limited to small samples and thus require replication.

Are Schemas Associated with Positive Psychotic Symptomology?

Overall, 15 studies explored associations between schemas and positive psychotic symptomatology, with some studies lending support to the cognitive models of psychosis (e.g. Garety et al., 2001).

Total positive symptoms. One study measured total positive symptoms (i.e. total positive symptoms score) in a clinical psychosis group using the Scale for the Assessment of Positive Symptoms (Andreasen, 1984). Results indicated no association with negative-self schema, however increased negative-other schema was associated with elevated levels of total positive symptoms (Smith et al., 2006).

Three studies utilised the YSQ-SF and the Positive and Negative Syndrome Scale (Kay, Fiszbein, & Opler, 1987) to investigate this relationship further (Bortolon et al., 2013; Sundag et al., 2016; Khosravani et al., 2019). Studies found that a higher total EMS score was associated with more severe positive symptoms, however there was some inconsistency regarding which specific EMS were relevant. Two studies found that the mistrust/abuse schema remained the only significant association when controlling for depression (Bortolon

et al., 2013; Khosravani et al., 2019), highlighting the importance of this schema. However, other research failed to replicate this finding (Sundag et al., 2016). The researchers hypothesised that the samples differed in their experience of childhood traumas, which are assumed to relate to the presence of the mistrust/abuse schema (Young et al., 2003). Overall, findings suggest that EMS and negative-other schema specifically, are clinically relevant when considering total positive symptoms in psychosis groups. These findings can be best understood within the framework of Garety et al's cognitive model (2007).

Four studies investigated associations between schemas and total positive symptoms amongst at-risk groups and findings to date are inconsistent. Stowkowy and Addington (2012) found a higher total negative-schema score (a total score was computed as negative-self and other-schema were highly correlated) was associated with increased total positive psychotic symptoms, as measured by the Scale for Assessment of Prodromal Symptoms (SOPS; McGlashan et al., 2010). Later research replicated the association with negative-other schema, however no association was found with negative-self schema (Stowkowy et al., 2016). Although these studies offer preliminary evidence to suggest an association between negative schemas and total positive symptoms in at-risk groups, other studies highlight some discrepancies and indicate no relationship between negative schemas and total positive symptoms (Saleem et al., 2014; Cowan et al., 2018).

Specific positive symptoms. There is evidence to suggest that particular schema are relevant in the development of specific positive psychotic symptoms (i.e. specific symptom subscales). Findings suggest that different sub-types of delusions (i.e. persecutory or grandiose) may reflect distinct types of schema. Three studies investigated associations between schema and persecutory delusions in clinical psychosis groups; findings suggest that individuals who endorsed more negative-self schema had an increased chance of experiencing persecutory delusions (Smith et al., 2006; Garety et al., 2013). These findings

offer tentative support to the 'delusion as a defence' hypothesis (Lyon, Kaney, & Bentall, 1994), which suggests persecutory delusions function as a defence against underlying low self-esteem. Findings regarding negative-other schema are unclear; no association was found when controlling for mood and self-esteem (Smith et al., 2006), however later research limited by a small clinical group ($N=16$) found persecutory delusions were characterised by elevated negative-other schema (MacKinnon et al., 2011). Arguably, negative-self and other-schema are both relevant cognitive processes in persecutory delusions and findings are consistent with the threat anticipation cognitive model (Freeman & Garety, 2004). Nonetheless, the evidence for negative-other schema is less clear and conclusions must be treated cautiously.

Two studies explored the relationship between schemas and grandiose delusions. Findings suggest that the endorsement of positive schema in particular, may underlie grandiose delusions. Early research concluded that grandiose delusions were predicted by the endorsement of fewer negative-self schema and increased positive-self and other-schema (Smith et al., 2006; Garety et al., 2013). Findings in relation to negative-other schema are unclear and conclusions are unable to be made. For example, Smith et al. (2006) reported no association between negative-other schema and grandiose delusions when performing correlational analyses, however their regression analyses indicated that negative-other schema were independently associated with grandiose delusions. Such findings may be best understood within the context of the emotion consistent account (Smith et al., 2005), however the studies do not indicate any direction of causality. In summary, there is evidence to draw tenuous conclusions that there are distinct psychological processes at work dependent upon delusional subtype.

One study explored the association between schema and the distress associated with delusional experiences (Smith et al., 2006). Elevated negative-self schema was associated

with an increased amount and intensity of distress, whilst negative-other was related to amount of distress only. Negative-self and other-schema were associated with a greater preoccupation with delusions. Negative-other schema only was related to the amount of conviction an individual had regarding their delusional beliefs. These findings can be understood within the context of cognitive models of psychosis (Garety et al., 2001; Garety et al., 2007), which suggest that negative schema are closely associated with the emotional distress experienced as a result of psychotic symptoms. Freeman et al's (2002) persecutory delusions model also provides context to these findings. The model proposes that negative schema associated with distress are reflected in the content of delusions and following the formation of the delusion, negative schema are likely to be confirmed, possibly worsening and maintaining distress. Smith et al. did not report differences in levels of distress dependent on delusional subtype, however the clinical psychosis sample included significantly more individuals with persecutory delusions (55%) than grandiose delusions (17%). Freeman et al. suggest that distress arises from the content of the delusions and further appraisal of the delusional experience, and therefore we might expect persecutory delusions to have a stronger association with distress given their typically threatening nature. As this finding is limited to one study that recruited a relatively small sample, conclusions must be treated cautiously until findings are replicated.

It is increasingly recognised that paranoia is a spectrum, with the experience of persecutory delusions at the extreme end (Freeman & Garety, 2014). Two studies examined associations between schemas and paranoia, and findings to date remain unclear. There is initial evidence suggesting that elevated negative-self schema are associated with increased paranoia, thus, when an individual perceives themselves as vulnerable, paranoia is expressed (Müller et al., 2016). Such findings are consistent with Trower and Chadwick's (1995) proposal that individuals with 'bad me' paranoia believe that they deserve to be persecuted—

reflected here in negative-self schema scores. However, controlling for anxiety and depression resulted in this finding becoming non-significant finding (Freeman et al., 2012). On the contrary, a regression analysis found no association between paranoia and negative-self schema, whereas an association with negative-other schema was found (Müller et al., 2016). Thus, consistent with Trower and Chadwick's model, those with 'poor me' paranoia perceived themselves as undeserved victims—reflected here in negative-other schema scores. Overall, these findings support the idea that negative evaluations and mistrust of others can feed into the development of paranoia on their own, or possibly in combination with negative views of the self.

Two studies offer preliminary evidence to suggest that schemas, particularly negative-self schema, are important cognitive mechanisms in auditory verbal hallucinations. Thomas, Farhall and Shawyer (2013) found that negative-self schema were strong predictors of beliefs about voices. Negative-other and positive-self schema were also important in the formation of beliefs about voices. These findings are consistent with cognitive theories that suggests schemas play a role in how an individual appraises their voice-hearing experience and their resulting beliefs about voices. Furthermore, negative-self schema were associated with negative voice content and how distressing the voice-hearing experience was perceived, supporting Garety et al's (2001) cognitive model. Negative-other schema however were unrelated to these dimensions (Smith et al., 2006).

Research suggests that a range of specific symptoms observed in at-risk groups are characterised by negative schema. Those who endorsed elevated negative-other schema had greater paranoid conviction, fewer beliefs that their persecution was deserved (Morrison et al., 2015), and more severe perceptual abnormalities and distress associated with this (Taylor et al., 2014). Negative-self schema were associated with suspicious/persecutory ideas (Cowan et al., 2018), deservedness of the persecution (Morrison et al., 2015), and paranoid ideation

(Müller et al., 2016). Negative-self and other-schema have also been found to be related to a range of positive psychotic symptoms dimensions, (i.e. unusual thought content, non-bizarre ideas, disorganised speech) and in particular, the distress associated with non-bizarre ideas (Taylor et al., 2014). In contrast, a study with a large sample size ($N=360$) found no associations between negative schema and specific positive symptoms (i.e. unusual thoughts/delusions, suspiciousness, grandiose ideas, perceptual abnormalities, disorganised communication; Saleem et al., 2014). A further study found no relationship between paranoia and negative-self schema (Morrison et al., 2015). In summary, there is evidence for relationships between specific symptoms and negative schema in at-risk groups, however findings are inconclusive.

Are Schemas Associated with Negative Psychotic Symptomology?

Negative symptoms and their association with schema have received less attention in the literature and findings are therefore less conclusive. Three studies recruited clinical psychosis groups and utilised the YSQ-SF. Early research found EMS were unrelated to negative symptoms (Bortolon et al., 2013; Sundag et al., 2016), however research with a larger sample found that the social isolation EMS was associated with negative symptoms (Khosravani et al., 2019). This can be understood in the framework of Rector et al's cognitive model (2005), which suggests that as schema are triggered individuals may socially isolate themselves to protect from possible external threats. Further research is necessary to establish whether this novel finding can be replicated before firm conclusions can be drawn regarding the significance of this schema to negative symptoms, as well as the direction of causality. Nonetheless, the social isolation schema may be meaningfully related to negative psychotic symptoms.

Findings concerning the relationship between negative symptoms and schema amongst at-risk groups are contradictory. For example, Stowkowy et al. (2016) found that positive and negative schemas were unrelated to attenuated negative symptoms of psychosis as measured by the SOPS. Conversely, Cowan et al. (2018) found that self-schema may be important when considering negative symptoms in at-risk groups. The researchers concluded that increased negative-self schema and fewer positive-self schema uniquely predicted total negative symptoms. This finding lends support to the cognitive model described by Rector and colleagues (2005), however subsequent analysis suggested this relationship may have been mediated by depression (Cowan et al., 2018). Further studies exploring associations between schemas and negative symptoms in at-risk groups are necessary to provide further clarity.

Do Schemas Mediate the Link Between Adversity and Psychosis?

According to cognitive models of psychosis, early traumatic experiences may create an enduring cognitive vulnerability characterised by negative schema (e.g. Garety et al., 2007). Such schema may lead to paranoid interpretations of experiences and thereby influence the formation of psychotic symptoms. Emerging literature lends support to this model, for example, an at-risk group reporting early trauma showed elevated negative-self and other-schema (Addington et al., 2013). Preliminary evidence suggests that specific types of traumatic experiences may underlie distinct types of negative schema. Stowkowy et al. (2016) found that early psychological and physical abuse was associated with elevated negative-self schema, whereas psychological bullying was associated with elevated negative-other schema in an at-risk group. No associations were found between positive schema and early adversity.

Whilst research has reported a relationship between early trauma, psychosis, and schemas, there is initial evidence suggesting that schemas may partially mediate this association. Hardy et al. (2016) found negative-other schema partially mediated the relationship between childhood emotional abuse and persecutory delusions. A later study investigated whether schema underpinned the association between early trauma and a heightened risk of developing psychosis (Appiah-Kusi et al., 2017). Researchers found that negative-self schema mediated 14.7% of the total effect of childhood emotional neglect on the risk of presenting as being at high-risk for developing psychosis. Furthermore, negative-self schema mediated 42.2% of the total effect of emotional neglect in childhood on the severity of paranoid ideation.

Central to Garety et al's (2001) cognitive model is the role of early social adversities, which are proposed to contribute to the development of negative-schemas. Three studies provide initial evidence to conclude that schemas are meaningfully related to socially adverse experiences. Findings suggest that social adversity can influence the development of social defeat, which describes an enduring feeling of having an outsider status and is a risk factor to developing psychosis (Selten & Cantor-Graae, 2005). Stowkowy and Addington (2012) found that negative schemas partially mediate the relationship between social defeat and positive symptoms of psychosis. These results indicated that social adversities could contribute to the development of persistent negative schemas, which may relate to psychotic symptoms (Stowkowy & Addington, 2012). The researchers hypothesised that social defeat scores reflected early social adversities in the at-risk group, however a measure investigating early trauma was not utilised.

Later research focused on perceived discrimination in the development of positive psychotic symptoms in an at-risk group. Saleem and colleagues (2014) reported that perceived discrimination was associated with negative schemas but not directly with positive

symptoms and therefore, this may suggest that negative-self and other-schema lead to an increased perception of being discriminated against. More pronounced EMS were found to contribute to increased paranoid responses to social stress amongst clinical psychosis groups reporting persecutory delusions (Sundag et al., 2017). Thus, schemas are possibly relevant to psychosis symptom formation and when an individual is exposed to social stressors, maladaptive schema are activated.

Overall there is preliminary research to suggest that negative schemas may have a role in the association between adversity and psychosis, however, it is difficult to draw conclusions from cross-sectional studies. Positive findings to date should justify the investment of further research looking more closely at these potential mechanisms.

Is Psychological Intervention Effective in Altering Schemas?

Given the evidence to suggest that paranoid symptoms may be associated with negative-self schema, Freeman et al. (2014) conducted a randomised controlled trial (RCT) aimed at targeting self-schema through a cognitive-behavioural therapy (CBT) intervention. The intervention produced short-term gains for the treatment group post-intervention. There was a small reduction in negative-self schema and a moderate reduction in paranoia, however neither findings were statistically significant in this pilot study. The treatment group's positive-self schema scores increased significantly post-intervention. Although this intervention targeted mechanisms contributing to the delusions, paranoia levels also reduced. This can be understood in line with Freeman et al's (2002) framework, which suggests that persecutory beliefs are formed when negative-schemas are drawn upon in search for meaning of an internal experience. This study highlights the potential value of targeting self-schema in the psychosis population, however replication is necessary.

Methodological Critique of the Studies

There are some limitations that need to be considered when interpreting the findings of the reviewed studies. Several studies recruited relatively low numbers of participants, with eight studies recruiting 30 or fewer participants to their clinical group. Further to this, male participants dominated the samples and some studies had large disparities between their clinical and control groups in relation to demographic variables and sample sizes. These studies may have lacked the statistical power to detect small effect sizes, which limits the conclusions that can be drawn.

Many studies recruited clinical groups from community services, which may not represent the full range of individuals endorsing psychotic symptoms. There may have been selection bias in some studies, for example, participants with persecutory delusions are likely to be difficult to recruit to research due to their concerns about the intentions of others and this may have resulted in a sample of participants experiencing delusions of a lower severity than what would be typical of this population (e.g. MacKinnon et al., 2011). Only one study included a clinical control group of participants with depression (Sundag et al., 2016); it is important for future research to consider the inclusion of non-psychotic clinical control groups (e.g. participants experiencing anxiety, depression etc.) as this would strengthen conclusions regarding the role of schema functioning in psychosis in particular. Although two studies recruited non-clinical PLEs groups, allowing the concept of the psychosis continuum to be considered more thoughtfully, there were some limitations to their recruitment methods employed. Taylor et al (2014) recruited a sample of students to their non-clinical PLEs group and did not assess for any current or past mental health difficulties. Whereas, Peters et al (2016) targeted a selective sample from specialist interest organisations, and such individuals tend to be high functioning. Both non-clinical PLE groups recruited may be less representative of the broader group of individuals with PLEs in the general population.

All 23 studies used self-report measures to assess for schemas, and the limitations of such methods are well-established (e.g. question misinterpretation and response bias). Schemas were assessed for using one of two measures (i.e. BCSS and YSQ-SF) that operationalise schemas somewhat differently, therefore making it difficult to directly compare study findings. Concurrent validity across the subscales of these measures has ranged from low to high (Fowler et al., 2006) and therefore, some subscales are potentially measuring different constructs. Although the YSQ-SF attempts to assess EMS, it is unclear if the assessed schemas developed in childhood and how strongly linked maladaptive schemas are to key childhood experiences. Only a small number of studies (n=5) assessed for childhood trauma or early childhood adversities, all relying on retrospective reporting which could be subject to recall bias. Furthermore, there are some limitations to the schema measures utilised; the responses given by participants may change dependent on their situation, and to account for this some studies report collecting data in an emotionally neutral environment (e.g. Appiah-Kusi et al., 2017). Finally, varied and brief assessments of symptom dimensions were occasionally used (e.g. the Paranoia Checklist; Freeman et al., 2005) and fuller assessments may have provided richer detail on psychotic symptoms. Although some studies did attempt to control for possible confounding variables, brief measures were used, for example, Sundag and colleagues (2016) controlled for depression using only one single item.

The majority of the studies used a cross-sectional design and cannot therefore adequately address the issue of causation. Thus, the underlying mechanisms of causality and directionality in the relationships observed between schemas and symptoms of psychosis remains unclear. There is a need for research to employ more robust methodologies and longitudinal designs to allow firmer conclusions to be made regarding the direction of causality. Only one RCT design was utilised (Freeman et al., 2014); limitations of this study

include its short-term intervention with only a one-month follow-up, and further to this no formal power calculation was conducted.

Finally, most of the studies were undertaken in western societies, with the exception of two studies (Khosravani et al., 2019; Chung et al., 2013), and whilst it is possible that the endorsement of schema may differ across different cultures, this was not considered. Not all studies reported on participant ethnicity however of those that did, clinical groups were largely White/Caucasian and lacked ethnic diversity, eliminating the possibility of examining any potential differences amongst ethnic groups, whilst also limiting the generalisability of the findings.

Future Research and Clinical Implications

The limitations of the reviewed studies indicate a number of important considerations and provide direction for future studies. Further longitudinal studies may enhance the evidence-base and provide further clarity regarding fluctuations in schema functioning across an individual's psychosis journey. This may assist with discovering possible target areas for therapeutic intervention, dependent upon stage of psychosis. Determining the effectiveness of altering schemas through a CBT intervention requires further research. As initial results were promising, the literature would be strengthened from further RCTs. RCTs may benefit from recruiting larger samples and investigating specific intervention techniques and their subsequent impact on particular schema. Given the evidence to indicate that there are distinct psychological processes at work dependent on delusional subtype, it may be helpful for intervention studies to tailor their intervention specifically to delusional subtypes and their associated schemas.

On the basis of the available evidence, it may be of value to assess for schemas clinically using validated measures and to incorporate schemas into psychological

formulations. There is tentative evidence to suggest that targeting schemas may be a core area of focus for therapeutic intervention for psychosis clinically, as an alternative to directly targeting psychotic symptoms. Theoretically, results of the studies included for review lend some support to cognitive models of psychosis.

Conclusions

In conclusion, negative self and other-schema are likely to be present across the continuum of clinical psychosis groups but are not characteristic of non-clinical PLEs group. Tentatively, it can be suggested that schemas may change over time and negative schema possibly increase at the time of transition from an at-risk state to FEP. The literature to date is limited and inconclusive, and overall there is insufficient evidence to conclude that negative schemas differentiate between at-risk groups and those with a first episode or fully developed psychotic disorder. Positive schema are less researched and there is no robust evidence to conclude that this schema differentiates groups on the continuum; however evidence is emerging that positive schemas characterise individuals who have achieved recovery and non-help seeking individuals having PLEs.

This review largely found associations between schema and specific positive psychotic symptoms, supporting cognitive models of psychosis. Tentatively it can be concluded that particular symptoms may reflect distinct underlying schema. Evidence concerning negative symptoms and their association with schema is emerging, however, these findings are contradictory and limited to a small number of studies. A limited number of studies offer support to consider schema as a mediator of early trauma and later psychotic symptoms, supportive of the cognitive model. Finally, there is initial evidence to suggest that it is possible to target underlying schema through a CBT-intervention, as opposed to directly targeting psychotic symptoms.

Ethical Statement

No ethical approval was required as this is a review of published literature.

Conflict of Interest

The authors declare no conflicts of interest with respect to this publication.

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Chapter 2: Empirical Study

Beliefs about Voices in Voice-Hearers: The Role of Schema Functioning

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Abstract

Background: Evidence is emerging that beliefs about voices are influenced by broader schematic beliefs about the self and others. Similarly, studies indicate that the relationship an individual has with their voice may mirror wider patterns of relating observed in social relationships, which may be influenced by schematic beliefs.

Aims: This study examined associations between beliefs about voices and self and other schema. Furthermore, associations between schemas and the perceived relationship between the hearer and their predominant voice were explored.

Method: Forty-four voice-hearing participants were recruited across mental health services. Participants completed self-report measures of beliefs about voices, schema functioning, and relating between the hearer and their voice. Dimensions of voice experience, such as frequency and content, were assessed using a clinician-rated scale.

Results: Beliefs about voices correlated with negative voice content and schemas. After controlling for negative voice content, schemas were estimated to predict between 1-17% of the variance in the six measured beliefs about voices; three of the associations reached statistical significance. Negative-self schema were the strongest predictors of beliefs about voices, whilst positive-self also showed potential relationships. Schemas also correlated with dimensions of relating between the hearer and their voice.

Conclusions: In line with previous research, this study provides evidence that schemas, particularly self-schema, may be important in the development of beliefs about voices. This study offers preliminary findings to suggest that schemas are also associated with the perceived relationship between the hearer and their voice.

Keywords: schemas, voice-hearing, auditory verbal hallucinations, beliefs about voices, relating

Introduction

Auditory verbal hallucinations (AVHs) can be defined as a sensory experience in the absence of any external stimulation, whilst in a fully conscious state (Beck & Rector, 2003). AVHs are most commonly experienced as voice-hearing, with the two terms used interchangeably. AVHs are typically associated with psychotic disorders (Waters et al., 2012), however there is evidence to suggest that they occur within the general population (Linscott & van Os, 2013) and by individuals diagnosed with other mental health difficulties (Kingdon et al., 2010). Some individuals experience AVHs as extremely distressing and disabling. Conversely, others report feeling reassured and may therefore seek contact with their voices (Chadwick & Birchwood, 1994).

Cognitive models of AVHs suggest that the types of appraisals and beliefs about voices influence the level of reported distress and disability. In particular, explanatory beliefs about voice intent (i.e. malevolent or benevolent) and voice power (i.e. omnipotence), as well as metacognitive beliefs about the self-related implications of voice-hearing, have been proposed as key mechanisms in understanding the development and maintenance of voices. Chadwick and Birchwood (1994) proposed that it is an individual's appraisal of voice intent and resulting beliefs about voices that mediate voice-related distress and predict behavioural responses to voice-hearing (e.g. compliance with AVHs). The model proposed by Morrison, Haddock and Tarrier (1995), highlights the central position of metacognitive beliefs about the voice-hearing experience. In particular, Morrison, Wells and Nothard (2002) suggested that positive beliefs held about the value of AVHs (e.g. "they make me special") may be associated with the maintenance of hallucinatory experiences. Self-related negative appraisals of AVHs as a threat to the physical or psychological integrity of the individual are associated with increased distress (Morrison, 1998; Morrison, 2001). Research has also found associations between voice content and beliefs about voices. In particular, where voice

content was positive individuals appraised their voices as benevolent, whereas malevolent appraisals were made where voice content was negative (van der Gaag, Hageman, & Birchwood, 2003; Close & Garety, 1998).

Whilst beliefs about voices are important mediators of the affective, cognitive, and behavioural response to AVHs, it is evident that these beliefs involve the hearer making interpretations beyond the content of the voice alone (Close & Garety, 1998). Within cognitive models of AVHs it is suggested that the formation of such beliefs is shaped by more generalised cognitive representations of the self (e.g. “I am worthless”) and others (e.g. “others are hostile”), referred to as schemas. Researchers suggest that early adversity may create an enduring cognitive vulnerability, characterised by negative schema, which contribute to the development and maintenance of AVHs (Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001; Garety, Bebbington, Fowler, Freeman, & Kuipers, 2007). As such, self and other-schema have been deemed important cognitive mechanisms when explaining the formation of beliefs about voices.

In a sample of 34 voice-hearing participants with diagnoses of schizophrenia or schizoaffective disorder, Thomas, Farhall and Shawyer (2015) reported that schemas significantly predicted malevolent, omnipotent, metaphysical, loss of control, and positive beliefs about voices. After controlling for negative voice content, schemas were estimated to predict between 9-35% of the variance in the six measured beliefs about voices, with negative-self schema being the strongest predictor. As such, schemas, particularly those regarding the self, may be important mechanisms in the development of a range of clinically-relevant beliefs about voices.

Given the emerging evidence to indicate an association between beliefs about voices and self and other-schema, it might be expected that schemas may also influence the way an individual relates to their voice. There is evidence that the hearer’s relationship with their

voice mirrors wider patterns of social relating (Hayward, 2003), thus conceptualising the experience of voice-hearing as a person-like stimulus that the hearer has a relationship with, rather than simply a perceptual experience (Hayward, Berry, & Ashton, 2011). Birtchnell (1996; 2002) proposed that individuals relate to their voice along two dimensions: proximity and power. Proximity is represented by the distance and degree of intimacy between the hearer and their voice, whilst power is represented by the amount of influence one has over another. Early research indicated that where voice-hearers experienced powerless and inferiority in social relationships, they felt powerless and subordinate relative to their voice (Birchwood, Meaden, Trower, Gilbert, & Plaistow, 2000; Gilbert et al., 2001; Birchwood et al., 2004).

Voice-hearing has been understood as an experience that involves ‘interrelating’; a combination of the hearer relating to their voice and being related to by their voice (Hayward, 2003). To measure interrelating, the Voice and You (VAY; Hayward, Denney, Vaughan, & Fowler, 2008) self-report questionnaire was developed, which assesses the hearer’s perception of the relating of their voice (i.e. as dominant or intrusive) and how the hearer relates to their voice (i.e. from a position of distance or dependence). Empirical findings highlight specific associations between each of the VAY relating subscales and distress (Sorrell, Hayward, & Meddings, 2010). Individuals who perceived their voice to relate more dominantly, intrusively, and therefore related to their voice from a distance, reported higher levels of distress. These associations however were not independent of appraisals of voice malevolence and omnipotence, possibly suggesting that these beliefs were influencing the strength of the reported associations. Perhaps intuitively, those who related to their voice more dependently were least distressed by their voice-hearing experience (Sorrell et al., 2010).

To date there is no known empirical evidence exploring potential associations between core schemas and the relationship between the hearer and their voice. Based on the available research, it is reasonable to predict that an individual who holds increased negative schemas about others (e.g. believing others to be hostile or bad) may perceive their voice as relating to them through a similar lens. Additionally, it is reasonable to expect that the position from which the hearer relates to their voice (e.g. distance) is influenced by schemas about themselves (e.g. believing one's self to be worthless or weak).

The primary aim of the current study was to determine associations between schemas and beliefs about voices. Hypotheses were made with the aim of testing the preliminary findings reported by Thomas et al. (2015). The current study also explored potential associations between schemas and the perceived relationship between the hearer and their predominant voice. Specifically, the following hypotheses were tested:

Hypothesis one: Negative beliefs about voices (i.e. malevolent, omnipotent, metaphysical, and loss of control subscales) will be associated with negative-self schema; malevolent and loss of control beliefs will be associated with negative-other schema; and positive beliefs will be associated with positive-self schema.

Hypothesis two: Schema scales will predict beliefs about voices, after controlling for the amount and degree of negative voice content.

Hypothesis three: Voice dominance and intrusiveness will be associated with negative-other schema.

Hypothesis four: Hearer distance and dependence will be associated with negative-self schema.

Method

Participants

Correlational analyses effect sizes reported by Thomas et al. (2015) ranged from medium ($r=.38$) to large ($r=.57$). Power analyses for the current study indicated that to have 80% power ($\alpha=.05$), 21 participants were required for detecting large effect sizes equivalent to $r=.57$, and 52 participants for detecting medium effect sizes equivalent to $r=.38$.

A total of 44 participants were recruited from adult community, acute adult inpatient, early intervention in psychosis, and child and adolescent mental health services across rural and urban areas of North Wales. Eligible participants were: (a) aged 16 and above; (b) currently experiencing AVHs; (c) history of voice-hearing of at least one year; and (d) sufficient literacy and cognitive ability to complete self-report questionnaires.

Six (14%) participants were recruited from inpatient services and 38 (86%) from community teams. Nine (21%) participants were in paid or voluntary employment and 22 (50%) were male. Participants reported hearing voices² for between one and 52 years ($M=13.45$, $SD=11.84$) and the overall mean age for the sample was 38.9 ($SD=14.57$). Demographic characteristics are provided in Table 1.

²There were two missing data points and the mean of the remaining sample was used as a substitute score.

Table 1

Participant Demographics

Demographic Variable	<i>N</i> (%) of sample
Ethnicity:	
White British	43 (98%)
Other	1 (2%)
First language:	
English	44 (100%)
Psychiatric diagnosis:	
Schizophrenia	16 (36%)
Schizoaffective disorder	3 (7%)
Psychosis	4 (9%)
Paranoid schizophrenia	8 (18%)
Bipolar disorder	1 (2%)
Personality disorders	3 (7%)
Multiple diagnoses	5 (11%)
No diagnoses	4 (9%)
Place of recruitment:	
Community	38 (86%)
Inpatient	6 (14%)
Employment status:	
Unemployed	30 (68%)
Employed (part-time, full-time, or apprentice)	7 (16%)
Voluntary worker	2 (5%)
Student	3 (7%)
Retired	2 (5%)
Medication status:	
Antipsychotic	40 (91%)
No medication for voice-hearing	4 (9%)

Note. *N*=44; Percentages are rounded and may not total 100%.

Procedure

Health board and university ethical approval was obtained (Appendices A, B and C). Local clinicians were informed of the research and individuals who met the eligibility criteria were approached during routine clinical appointments. Interested participants returned the initial contact form to the first author or informed their treating clinician if they wished to take part. Once written consent was given, questionnaire measures were administered during one appointment.

Measures

The Psychotic Symptom Rating Scales - Auditory Hallucinations Subscale

(PSYRATS; Haddock, McCarron, Tarrier, & Faragher, 1999). The PSYRATS is a widely-used 11-item interviewer-rated scale that measured the severity of different dimensions of participants' voice-hearing experience (e.g. frequency, content, distress). Participants rated their experience over the previous week on a 5-point scale of increasing severity (0-4). The PSYRATS has good psychometric properties (Haddock et al., 1999; Drake, Haddock, Tarrier, Bentall, & Lewis, 2007).

The Interpretation of Voices Inventory (IVI; Morrison et al., 2002). The IVI is a 26-item self-report questionnaire that assessed metacognitive beliefs about voices. Three subscales are derived, reflecting three beliefs about voices: negative metaphysical beliefs (e.g. "they mean I have done something bad"), loss of control beliefs (e.g. "they will make me go crazy"), and positive beliefs (e.g. "they make me important"). Participants rated their agreement with each item on a four-point scale (1-4) ranging from 'not at all' to 'very much'. The IVI has shown good test retest reliability (coefficients ranged from 0.73-0.84) and internal consistency (Cronbach's α all ≥ 0.80 ; Morrison et al., 2002).

The Revised Beliefs about Voices Questionnaire (BAVQ-R; Chadwick, Lees, & Birchwood, 2000). The BAVQ-R is a 35-item self-report questionnaire that was used to measure beliefs about voices. Three subscales are derived: malevolence (e.g. "my voice is punishing me for something I have done"), benevolence (e.g. "my voice wants to protect me"), and omnipotence (e.g. "my voice seems to know everything about me"). Participants rated items on a four-point scale (0-3) ranging from 'disagree' to 'strongly agree'. The measure has good psychometric properties with Cronbach's α for each subscale ≥ 0.74 (Chadwick et al., 2000).

The Voice and You (VAY; Hayward et al., 2008). The VAY is a 29-item self-report questionnaire that assessed participants' interrelating with their predominant voice. Four subscale scores are derived: two concerning the hearer's perception of the relating of the voice ('voice dominance' and 'voice intrusiveness') and two concerning the relating of the hearer ('hearer distance' and 'hearer dependence'). Participants rated items on a four-point scale (0-3) ranging from 'rarely true' to 'nearly always true', with higher scores indicating a greater tendency to relate negatively from that position. The subscales have shown good internal consistency (Cronbach's α all ≥ 0.78) and test-retest reliability (coefficients ranged from 0.72-0.91; Hayward et al., 2008).

The Brief Core Schema Scales (BCSS; Fowler et al., 2006). The BCSS is a self-report questionnaire that was used to assess self and other-schema. The measure includes 24 items rated on a on a five-point rating scale (0-4). Four subscale scores are obtained relating to negative and positive self (e.g. "I am vulnerable"; "I am successful") and other (e.g. "other people are devious"; "other people are supportive") schema. The potential range of scores for each subscale is 0-24; higher scores represent greater endorsement of a particular schema. The BCSS has shown good internal consistency (Cronbach's α all ≥ 0.78) and construct validity across both psychosis and high-risk samples (Fowler et al., 2006; Addington & Tran, 2009).

Data Analysis

Statistical analyses were performed with IBM SPSS version 25 (IBM Corp, 2017). The distributions of all continuous demographic and clinical variables were assessed for normality using the Shapiro-Wilk test and visual inspection of Q-Q plots. The majority of

variables³ were non-normally distributed. Following square, square root, and bimodal transformations as appropriate, the variables remained non-normal and therefore the non-transformed variables were selected for all subsequent analyses.

To test hypotheses one, three and four, Spearman's rho correlational analyses examined associations between beliefs about voices, negative voice content (amount and degree), schema subscales, and relating subscales. To test hypothesis two, a series of hierarchical regression analyses were conducted for each of the six beliefs about voices. In each analysis the two negative voice content variables measured on the PSYRATS were entered as predictors in step 1 and the schema scales identified as holding a bivariate correlation with that belief at $p \leq .10$ (see Table 3) were entered as predictors in step 2. For each regression analyses the data was screened for multicollinearity (no predictor variables were intercorrelated $r > .9$), normality, linearity, and homoscedasticity. Heteroscedasticity was observed for the benevolence subscale, whilst loss of control and positive beliefs were non-normally distributed. These variables were therefore recoded using a median split and the regressions rerun using the recoded variables. Based upon the existing literature suggesting associations between beliefs about voices and associated distress (e.g. Chadwick & Birchwood, 1994; Morrison, Northard, Bowe, & Wells, 2004), regressions were rerun to examine whether the inclusion of these potential confounding variables (i.e. PSYRATS amount and intensity of distress) changed the pattern of results.

³Age, years hearing voices, BCSS positive-self and negative-self, IVI positive and loss of control belief subscales, BAVQ-R malevolence, omnipotence and benevolence subscales, all VAY subscales, PSYRATS amount and degree of negative content and intensity and amount of distress subscales.

Results

The mean scores and standard deviations for each of the main measures are presented in Table 2. High rates of endorsement of negative-self and other-schema were observed, similar to those reported by Fowler et al. (2006).

Table 2

Mean Scores on the Main Measures

Subscale	Mean	SD
PSYRATS Amount of Negative Content	3.18	0.84
PSYRATS Degree of Negative Content	3.16	1.08
PSYRATS Amount of Distress	2.82	1.15
PSYRATS Intensity of Distress	3.11	1.08
IVI Positive Beliefs	11.91	5.21
IVI Metaphysical Beliefs	29.14	10.40
IVI Loss of Control Beliefs	12.75	4.69
BAVQ-R Malevolence	10.91	5.04
BAVQ-R Benevolence	3.50	4.42
BAVQ-R Omnipotence	11.77	4.54
BCSS Negative-self	9.66	7.61
BCSS Positive-self	7.18	5.44
BCSS Negative-others	9.02	5.54
BCSS Positive-others	9.93	5.09
VAY Hearer Dependence	7.59	5.82
VAY Hearer Distance	15.45	5.70
VAY Voice Dominance	15.02	7.57
VAY Voice Intrusiveness	9.16	5.19

Note. $N=44$; $\dagger p \leq .10$; $*p \leq .05$; $**p \leq .01$; $***p \leq .001$; PSYRATS=Psychotic Symptoms Rating Scales; IVI=Interpretation of Voices Inventory; BAVQ-R=Revised Beliefs about Voices Questionnaire; BCSS=Brief Core Schema Scales; VAY=the Voice and You.

Hypothesis One

Correlations between beliefs about voices and schema scales were analysed (see Table 3). Five of the beliefs showed significant correlations with one or more of the schema scales, with the exception of positive beliefs about voices. As predicted, all four negative beliefs about voices were associated with negative self-schema and loss of control beliefs

were associated with negative-other schema. Contrary to our predictions, the malevolence scale was unrelated to negative-other schema, whilst positive beliefs were unrelated to positive-self schema.

Significant relationships were also found between schemas and beliefs about voices that had not been predicted. In particular, the benevolence subscale was associated with positive-self and other-schema, and showed a negative association with negative-self schema. All four negative beliefs about voices correlated negatively with positive-self schema. The omnipotence subscale was associated with negative-other schema and showed a negative relationship with positive-other schema. All six beliefs about voices were associated with either the amount and/or degree of negative voice content (see Table 3).

Table 3

Correlational Analyses between Beliefs About Voices, Negative Voice Content, and Schema Scales

Belief Subscale	PSYRATS Negative Content		BCSS Self-Schema		BCSS Other-Schema	
	Amount	Degree	Negative	Positive	Negative	Positive
<i>BAVQ-R</i>						
Malevolence	.72***	.43**	.56***	-.31*	.23	-.25
Benevolence	-.58***	-.22	-.42**	.30*	-.07	.32*
Omnipotence	.51***	.69***	.75***	-.50***	.47***	-.38**
<i>IVI</i>						
Metaphysical	.64***	.68***	.61***	-.45**	.28†	-.28†
Loss of Control	.64***	.61***	.71***	-.42**	.36*	-.26†
Positive	-.44**	.02	-.11	.23	.25†	.09

Note. $N=44$; † $p \leq .10$; * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; PSYRATS=Psychotic Symptoms Rating Scales; IVI=Interpretation of Voices Inventory; BAVQ-R=Revised Beliefs about Voices Questionnaire; BCSS=Brief Core Schema Scales.

Multiple ad hoc comparisons were made between other demographic and clinical variables. All four negative beliefs about voices were related to gender (metaphysical $t(35)=-$

2.759, $p=.009$; loss of control $t(41)=-3.517$, $p=.002$; malevolence $t(41)=-2.885$, $p=.008$ and; omnipotence $t(41)=-2.347$, $p=.027$), with females endorsing significantly higher scores. In terms of the positive interpretations of voices, males reported significantly higher benevolent beliefs ($t(30)=2.237$, $p=.042$). Other than loss of control beliefs ($r=-.45$, $p=.002$), age was unrelated to any other beliefs about voices. There were no relationships identified between beliefs about voices and the number of years hearing voices.

Significant correlations were observed between distress and beliefs about voices. In particular, the amount of distress was related to metaphysical ($r=.50$, $p=.001$), loss of control ($r=.42$, $p=.004$), malevolent ($r=.62$, $p<.001$), benevolent ($r=-.36$, $p=.015$), omnipotent ($r=.41$, $p=.006$), and positive beliefs about voices ($r=-.34$, $p=.022$). The intensity of distress was related to metaphysical ($r=.38$, $p=.012$), loss of control ($r=.42$, $p=.004$), malevolent ($r=.38$, $p=.012$), benevolent ($r=-.33$, $p=.03$), and omnipotent beliefs ($r=.42$, $p=.004$).

Male participants endorsed significantly higher positive-self ($t(41)=2.486$, $p=.021$) and positive-other ($t(41)=2.168$, $p=.036$) schema and fewer negative-self schema ($t(41)=-3.976$, $p=.001$) than females.

Hypothesis Two

To examine the degree to which negative voice content and schemas predicted beliefs about voices, including after controlling for negative voice content, a series of hierarchical linear regressions were conducted. The amount and degree of negative voice content PSYRATS variables were entered as a first step, and the schema scales identified as correlated with that belief as a second step (see Table 4). Although the regressions using the dichotomised data were slightly less predictive (see Table 4), the differences were modest and therefore the regression results reported in text are based on the non-dichotomised variables. The estimated proportion of variance explained by negative voice content alone

ranged from 27-54%. Entering schemas in the second step explained statistically significant additional variance for three of the six beliefs, namely malevolent, omnipotent, and loss of control beliefs. The estimated proportion of additional variance explained by schemas ranged from 1-17%, with the total variance explained by negative voice content and schemas combined ranging from 28-65%.

On the basis of the observed bivariate correlations, more than one schema scale was entered as a predictor in five of the beliefs about voices regressions, with positive beliefs being the only exception. For the omnipotence, metaphysical, and loss of control regressions, all four schema scales were entered as predictors. Standardised regression coefficients for each of the schema scales are presented in Table 4. Negative-self schema emerged as an independent predictor for omnipotent and loss of control beliefs. Both negative-self and positive-self schema emerged as independent predictors of malevolent voice appraisals. No schema scale predicted benevolent, metaphysical, or positive beliefs about voices. To control for the effect of voice-related distress, the regressions were rerun including the PSYRATS amount and intensity of distress subscales as covariates. This did not change the pattern of results.

Table 4

Hierarchical Multiple Regression Analyses Predicting Beliefs About Voices from Negative Voice Content and Schema Scales

Belief Subscale	Predictor	R^2 change	F change	Standardised β	T
Malevolence	Step 1:	.54	24.450***		
	Amount of negative content			.64	5.066***
	Degree of negative content			.15	1.185
	Step 2:	.10	5.220**		
	Negative-self			.31	2.391*
	Positive-self			.37	2.722**
Benevolence	Total R^2	.64			
	Step 1:	.39	12.995***		
	Amount of negative content			-.69	-4.699***
	Degree of negative content			.14	.972
	Step 2:	.05	1.040		
	Negative-self			-.26	-1.562
Omnipotence	Positive-self			.03	.151
	Positive-others			.05	.345
	Total R^2	.43			
	Total R^2 for dichotomised variable	.30			
	Step 1:	.48	18.901***		
	Amount of negative content			.22	1.597
Metaphysical	Degree of negative content			.55	4.044***
	Step 2:	.17	4.433**		
	Negative-self			.37	2.459*
	Negative-others			.28	1.879†
	Positive-self			.08	.520
	Positive-others			.02	.113
Loss of control	Total R^2	.65			
	Step 1:	.51	21.724***		
	Amount of negative content			.41	3.126**
	Degree of negative content			.40	3.081**
	Step 2:	.07	1.464		
	Negative-self			.26	1.606
Positive	Negative-others			.10	.751
	Positive-self			.07	.410
	Positive-others			.13	.871
	Total R^2	.58			
	Step 1:	.52	21.965***		
	Amount of negative content			.47	3.564***
Positive	Degree of negative content			.35	2.659**
	Step 2:	.13	3.404*		
	Negative-self			.34	2.303*
	Negative-others			.18	1.482
	Positive-self			.10	.657
	Positive-others			.12	.932
Positive	Total R^2	.65			
	Total R^2 for dichotomised variable	.49			
	Step 1:	.27	7.713***		
	Amount of negative content			-.63	-3.914***
	Degree of negative content			.31	1.911†
	Step 2:	.01	.604		
Positive	Negative-others			.11	.777
	Total R^2	.28			
	Total R^2 for dichotomised variable	.27			

Note. $N=44$; † $p \leq .10$; * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Hypotheses Three and Four

Correlational analyses examined potential relationships between VAY subscales and schemas. All VAY subscales showed significant relationships with one or more of the schema scales (see Table 5). In line with predictions, the hearer's perception of their voice relating dominantly and intrusively was associated with negative-other schema, whilst the hearer relating to their voice from a position of distance and dependence was associated with negative-self schema. Further unexpected relationships were also observed. Specifically, voice dominance and intrusiveness were associated with negative-self schema, whilst voice intrusiveness and hearer distance negatively correlated with positive-self and other-schema.

Table 5

Correlational Analyses between Relating Subscales and Schema Scales

VAY Subscale	BCSS Self-Schema		BCSS Other-Schema	
	Negative	Positive	Negative	Positive
Hearer Distance	.46**	-.34*	.29†	-.32*
Hearer Dependence	.31*	-.10	.07	.10
Voice Dominance	.62***	-.29†	.37**	-.28†
Voice Intrusiveness	.68***	-.40**	.45**	-.31*

Note. $N=44$; † $p \leq .10$; * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; BCSS=Brief Core Schema Scales; VAY=the Voice and You.

Discussion

The primary study aim was to explore associations between self and other-schema and beliefs about voices, in light of preliminary evidence to suggest that schemas may be important cognitive mechanisms when considering voice appraisals (Thomas et al., 2015). Hypothesis one predicted a range of relationships between schemas and beliefs about voices and overall, it can be concluded that schemas were relevant when considering all but one of

the measured beliefs, with effect sizes ranging from medium to large. The exception however was positive beliefs about voices measured by the IVI (Morrison et al., 2002); this insignificant finding contradicted previous research that found the endorsement of more positive beliefs was associated with elevated positive-self schema (Thomas et al., 2015). Overall, the results support cognitive models and suggest that schemas are key in the development of beliefs about voices.

As predicted, the endorsement of increased negative-self schema was associated with having more negatively orientated beliefs about voices, in line with previous findings (Thomas et al., 2015). The largest effect sizes were observed between negative-self schema and the omnipotence and loss of control belief subscales. The association between omnipotence and negative-self schema is consistent with earlier findings, which indicate that the reported power and status differential between the hearer and the voice is associated with appraisals of the hearer's perception of their power and status in the social world (Birchwood et al., 2000). The current study showed an additional novel relationship suggesting that those who endorsed increased negative-self schema, also held fewer benevolent voice appraisals. Our findings provide further support to conclude that negative-self schema are relevant when considering beliefs about voices and are elevated in voice-hearers who hold negatively orientated beliefs about voices.

Previous research has indicated that further clarity regarding the role of negative-other schema was desirable as this had not been found to be widely associated with beliefs about voices in comparison to negative-self schema (Thomas et al., 2015). Thomas et al. found associations between negative-other schema and both malevolent voice appraisals and loss of control beliefs. In the current study the association with loss of control beliefs was replicated, however we were unable to replicate the association with malevolence. This is surprising as we might intuitively expect that viewing other people as hostile or untrustworthy would relate

to appraisals of malevolence (e.g. perceiving the voice as evil or wanting to cause harm). A novel and significant finding suggests that endorsing more negative-other schema was associated with more omnipotent voice appraisals. These findings potentially create further uncertainty regarding the precise role of negative-other schema in beliefs about voices, and further research is warranted with a larger sample size. Nevertheless, this suggests that negative-other schema may play a role when considering beliefs about voices, although their role with specific beliefs remains unclear.

Findings indicated that the endorsement of increased positive representations of others was significantly associated with more benevolent and fewer omnipotent voice appraisals. This suggests that positive-other schema is important when considering how an individual appraises their voices, in contrast with Thomas et al. (2015), who found no associations between positive-other schema and beliefs about voices. In relation to positive representations of the self, a number of novel findings emerged. In particular, positive-self schema were associated with benevolent voice appraisals and fewer negatively orientated beliefs. In the current sample, males had more benevolent beliefs and positive-self schema than females, therefore, there may have been a gender effect. This differed from Thomas et al. who found only one significant association between positive-self schema and positive beliefs about voices, which was not replicated in the current study. In sum, this suggests that increased positive-self *and* other-schema may impact upon the formation of benevolent voice appraisals.

In line with previous studies (e.g. Close & Garety, 1998; Smith et al., 2006; Thomas et al., 2015) beliefs about voices were found to be influenced by negative voice content. All of the measured beliefs about voices were related to either the amount or degree of negative voice content and a significant proportion of the variance in beliefs was predicted by negative voice content. Contrary to Thomas et al. (2015), there were stronger relationships between

the amount of negative content and beliefs about voices with large effect sizes observed, as opposed to the degree of negative content. Thus, the frequency of negative voice content was the strongest predictor of beliefs about voices rather than the degree of negativity. In line with previous research (e.g. Close & Garety, 1998; Thomas et al., 2015), positive and benevolent beliefs about voices increased when the amount of negative content was lower, suggesting that appraising voices positively is less likely when there is a significant proportion of negative voice content. These findings provide further evidence that negative voice content and beliefs about voices are meaningfully related and controlling for voice content is important for future studies.

Regression analyses were conducted to test hypothesis two, which stated that schemas would predict beliefs about voices after controlling for negative voice content. When controlling for the effect of negative voice content, only malevolent, omnipotent, and loss of control beliefs were significantly predicted by schemas. This differed from Thomas et al. (2015) who reported that five of the six beliefs about voices were significantly predicted by schemas when controlling for negative voice content. In the current study both negative and positive-self schema emerged as significant predictors of malevolent voice appraisals, whilst negative-self emerged as a predictor of omnipotent voice appraisals and loss of control beliefs. In sum, schematic beliefs influenced the formation of beliefs about the voice power and control (omnipotence), appraisals of malevolent voice intent and beliefs about loss of control or impending madness (i.e. loss of control beliefs), and these findings were independent of negative voice content. When controlling for associated distress, none of the observed results changed, suggesting that these particular schemas independently predicted beliefs about voices.

The second study aim was to explore associations between schemas and the perceived relationship between the hearer and their predominant voice. To our knowledge, this had not

been studied before. Overall, a number of associations were found and hypotheses three and four were supported, suggesting that schemas may underlie both the hearer's relating to their voice and their perception of the voices' relating to them. In terms of the relating of the hearer to the voice, relating from a position of distance was associated with elevated negative-self schema and fewer positive-self and other-schema. Participants who rated themselves as more dependent upon their voice showed increased negative-self schema. This finding possibly lends support to research suggesting that voice-hearers who perceive themselves as inferior to others—reflected here in elevated negative-self schema scores—also feel inferior to their voice and therefore, relate accordingly (e.g. Birchwood et al., 2000; Gilbert et al., 2001; Birchwood et al., 2004). In terms of the hearer's perception of the relating voice, perceiving their voice to relate dominantly was associated with more negative-self and other-schema, whereas participants who perceived their voice as intrusive had more negative and fewer positive schemas. These findings suggest that schemas that guide interpersonal interactions also govern the relationship between the hearer and their voice. These findings should however be interpreted with caution, as three of the VAY subscales showed a similar pattern of relationship with schemas with only hearer dependence showing a distinctive pattern. This may suggest that the subscales are not measuring distinct constructs.

Study Strengths and Limitations

Recruitment took place in inpatient services in addition to community services, and therefore the sample included voice-hearers with a range of levels of disorder accessing mental health treatment. This recruitment method resulted in a representative but heterogeneous sample which possibly reduced external validity.

The cross-sectional design does not allow any changes in schemas and other variables to be assessed over time and it is not possible to infer the direction of causality between variables. It is probable that the use of self-report measures may have led to response bias in participants. Although we controlled for negative voice content and distress, it is possible that other variables contributed to our findings that we did not assess and therefore control for, such as depression, which previous research has concluded is associated with omnipotent and malevolent voice appraisals (Birchwood & Chadwick, 1997).

Strengths of this study were the increased sample size and power to detect medium to large effect sizes in comparison to previous studies (e.g. Thomas et al., 2015). Nevertheless, it is likely that the current study was underpowered to detect small effect sizes due to a slightly smaller sample size than indicated by the power analysis. Participants were recruited from a wide geographical area and gender was well balanced across the sample. In summary, this study has enabled firmer conclusions to be made regarding the role of schemas in the voice-hearing experience and offers important implications for clinical practice and future research.

Suggestions for Future Research

Schemas have been found to have a mediating role in early adversity and psychotic symptoms (Hardy et al., 2016), there is therefore potential for a mediating role in beliefs about voices, which our study did not consider. Future research may benefit from utilising a measure of early traumatic experiences and assessing whether schemas mediate the relationship between trauma and voice appraisals.

Given the preliminary evidence to suggest that schemas are associated with beliefs about voices, the evidence-base may be enhanced by conducting a pilot intervention study targeting self and other-schema in voice-hearers, as opposed to directly targeting beliefs

about voices. Freeman et al. (2014) utilised a cognitive-behavioural therapy intervention to target self-schema in individuals with persecutory delusions. Findings evidenced short-term non-significant reductions in negative-self schema, a significant increase in positive-self schema, and non-significant improvements in psychotic symptoms. Freeman and colleagues' research illustrates the potential of therapeutic intervention and also the difficulty of altering schemas, particularly using a brief intervention. Given that cognitive models of psychosis propose that there may be trauma underlying core schema that requires further therapeutic work (e.g. Garety et al., 2001), to enable psychological intervention to focus on schema a more in depth and lengthier approach may be more productive and should be a focus of future research.

It may be worthwhile for future studies exploring beliefs about voices to assess for both neutral and positive voice content, which may also contribute to the formation of beliefs about voices and therefore would allow further investigation in relation to schemas. Finally, the studies to date have been cross-sectional and longitudinal designs are preferable to allow insight into how our observed associations may change over time.

Clinical Implications

Developing a better understanding of the pathways involved in the development and maintenance of AVHs has implications for the psychological treatment of this clinical population. Assessment of schematic beliefs may assist clinicians in formulating the mechanisms that may be contributing to or maintaining the individual's voice-hearing experience. The use of a schema assessment tool has the potential to open a therapeutic dialogue to explore schematic beliefs further, which in turn may facilitate a richer therapeutic relationship and enable a more collaborative formulation to be devised. Our findings suggest that schemas may be supporting an individual's beliefs about voices and therefore, schemas

may offer a parallel focus of intervention or an alternative intervention target. Cognitive-behavioural therapy for voices focuses on reviewing the evidence for beliefs about voices and challenging the accuracy of these beliefs. However, research has found that beliefs about voice intent as malevolent are not easy to directly modify (e.g. Peters et al., 2010). Therefore, as an alternative to challenging voice appraisals, targeting self and other-schema using schema-change methods holds potential. A schema-focused cognitive-behavioural therapy approach would enable existing schematic beliefs to be evaluated and modified, whilst developing more functional and balanced schemas. Our findings suggest that positive schemas underpin benevolent voice appraisals and there are ways of working with voices, such as compassion-focused and acceptance-based therapies, that may be well suited to building positive schema rather than attempting to diminish negative schema (e.g. Mayhew & Gilbert, 2008; Thomas, Morris, Shawyer, & Farhall, 2013).

This research study tentatively concludes that the way in which the hearer relates to their predominant voice, may reflect underlying schematic beliefs. Therefore, assessing the relating style between the hearer and the voice may enable individuals to make connections between their voice-hearing experience and past and present social relationships (Hayward & Fuller, 2010), thus, providing valuable information to consider as part of a psychological formulation. Although therapies have been used to directly work on the relationship between the hearer and their voice (e.g. relating therapy; Birtchnell, 2002), our findings support an alternative route to modifying the hearer's relationship with their predominant voice through accessing schemas. The use of schema-change methods may indirectly influence the relating style between the hearer and their predominant voice. This study was however, the first to directly explore schemas and the relationship between the hearer and the voice and further studies are necessary prior to suggesting firm changes in clinical practice.

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Ethical Statements

The authors have abided by the Ethical Principles of Psychologists and Code of Conduct as set out by the APA. Ethical approval was granted by The School of Psychology Bangor University, (2018-16274), and the Betsi Cadwaladr University Health Board Research Ethics Committee and HRA and Health and Care Research Wales (REC reference: 18/WA/0264).

Conflict of Interest

The authors have no conflicts of interest with respect to this publication.

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Footnotes

¹ There were two missing data points and the mean of the remaining sample was used as a replacement.

² Age, years hearing voices, BCSS positive-self and negative-self, IVI positive and loss of control belief subscales, BAVQ-R malevolence, omnipotence and benevolence subscales, all VAY subscales, PSYRATS amount and degree of negative content, intensity and amount of distress subscales.

Chapter 3: Discussion Paper

Contributions to Theory and Clinical Practice

The current systematic literature review aimed to provide an overview of what the literature to date tells us about schemas in psychosis and at-risk populations. The empirical study aimed to further explore the relationship between schemas and voice-hearing, specifically beliefs about voices and the hearer's perceived relationship with their voice. The current discussion paper aims to bring together the literature review and the empirical study to demonstrate how both pieces of research contribute to current psychological theory and to consider the implications for future research and clinical practice. Personal reflections on the research process are also provided.

Theory development

Literature Review Paper

Cognitive models of positive psychotic symptoms (Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001; Garety, Bebbington, Fowler, Freeman, & Kuipers, 2007) provide a potential psychological framework that the current literature review findings can be best understood within. Figure 1 illustrates a diagrammatic representation of the cognitive model of psychosis, adapted from the theoretical paper of Garety et al. (2007). The literature review results revealed that self and other-schema were associated with a range of positive psychotic symptomology. Although causality could not be determined due to the cross-sectional nature of these studies, such findings potentially offer support to the central part of the cognitive model (Garety et al., 2001; Garety et al., 2007). This suggests that negative schemas may be one of the key psychological processes leading to the development and maintenance of positive symptoms of psychosis.

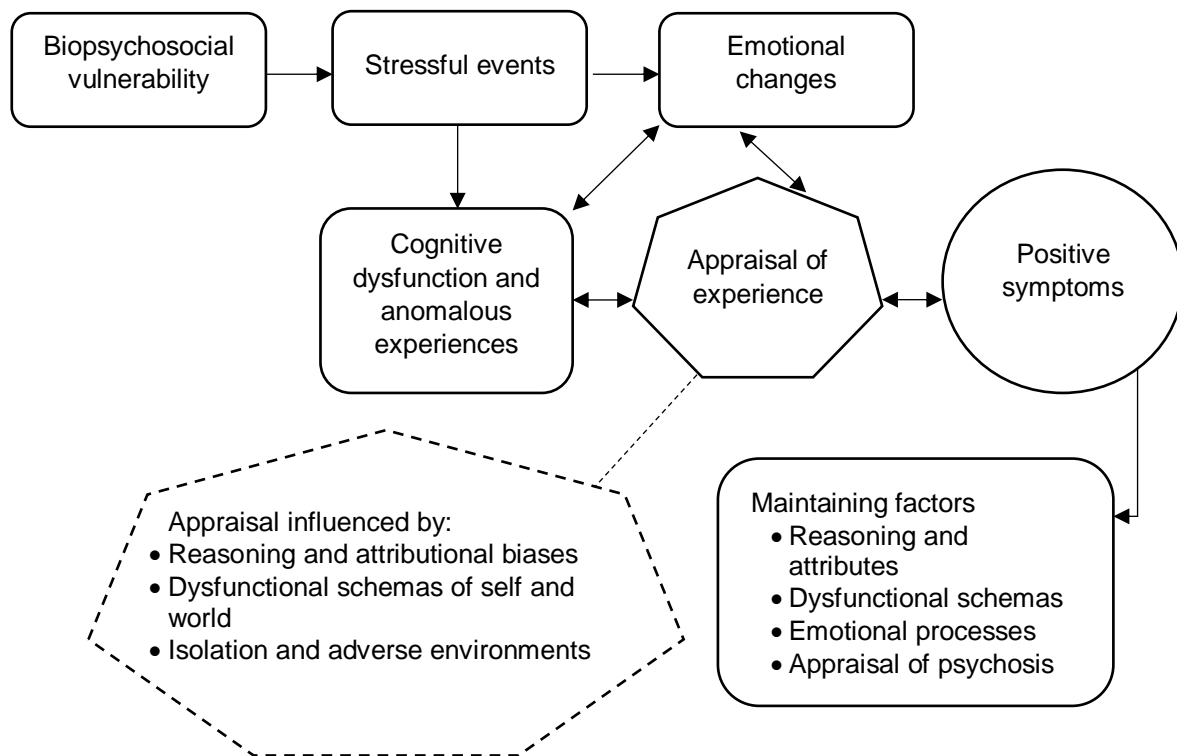


Figure 1. Diagrammatic representation of a cognitive model of the positive symptoms of psychosis (adapted from Garety et al., 2007)

Previous meta-analyses have found that adversity and traumatic experiences substantially increase the risk of developing psychosis, with various types of social adversities identified as risk factors, including childhood sexual abuse, bullying by peers (Varese et al., 2012), exposure to urban environments (Vassos, Pedersen, Murray, Collier, & Lewis, 2012), migration (Cantor-Graee & Selten, 2005), and adulthood adverse events (Beards et al., 2013). Despite these risks, only a minority of those who experience adversity go on to develop psychotic disorders (Fisher et al., 2010), and it remains unclear why some individuals go on to develop psychosis whilst others do not. It is therefore vital to understand the possible pathways from early adverse experiences to psychosis. Garety and colleagues

(2001) cognitive model proposes that early adversity and traumatic experiences may create an enduring cognitive vulnerability, characterised by negative schematic beliefs about the self and others. Our findings offer support to suggest that underlying schemas could be the linking mechanism between these adversities and psychotic experiences. The current literature review indicated associations between early traumas and elevated negative schemas in clinical samples, which lends support to the proposition by the cognitive model. Our findings provide initial support that schemas may partially mediate associations between early trauma and psychotic symptoms, thus, theoretically supporting Garety et al's (2001) cognitive model. Building on the cognitive model, the current literature review findings also offer preliminary evidence to suggest that the type of trauma experienced in childhood may reflect particular negative schema, suggesting different types of adversity will affect different emotional and cognitive systems.

Empirical Study

Chadwick and Birchwood's (1994) cognitive model of auditory verbal hallucinations proposed that how an individual appraises their voice-hearing experience is not always understandable in light of voice content alone, which has been supported by empirical research (e.g. Van der Gaag et al., 2003). Whether a voice is construed as malevolent, benevolent, or powerful, may be influenced by underlying schema, themselves hypothesised to be influenced by the individual's past and current life experiences and interpersonal relationships (Birchwood & Chadwick, 1997). The current empirical study findings support this proposal and suggest that schemas possibly act as a fundamental psychological process in the development and maintenance of beliefs about voices. Findings from the empirical study indicate that self-schema in particular are associated with three of the beliefs about voices (i.e. malevolence, omnipotence, and loss of control beliefs) beyond negative voice content

alone, which is supportive of Birchwood and Chadwick's (1997) theoretical proposal. Our research findings further highlight the relevance of beliefs about voices in understanding the voice-hearing experience. Therefore, these findings suggest that schemas may provide a pathway by which early experiences impact upon the formation of beliefs about voices. Our empirical study findings therefore lend support to the idea that underlying schema should be considered a core component of the cognitive model.

Several research studies have documented associations between early childhood trauma and the content of hallucinatory experiences (e.g. Read & Argyle, 1999; Corstens & Longden, 2013). Additionally, research has suggested that exposure to adversity might influence a hearer's appraisal of their voices by promoting the formation of negative beliefs about voices (Andrew, Gray, & Snowden, 2008). Such research supports cognitive models of psychosis and suggests that beliefs about voices may be influenced by more than voice content alone. It is possible that schemas may be the linking mechanism and provide a pathway by which early experiences impact upon the formation of beliefs about voices, which our empirical findings lend support to. Young, Klosko and Weishaar (2003) propose that negative maladaptive schemas typically develop in childhood when an environment does not meet the child's needs due to experiences such as abuse, neglect, and/or hostility. Although our study did not measure early traumatic experiences, it is possible that self and other-schema are the link between early trauma and the formation of beliefs about voices.

Birtchnell's theory of relating (1996, 2002) addresses the issues of both power and proximity and a number of earlier empirical studies have applied this theory to examine the relationship between a hearer and their predominant voice. Vaughan and Fowler (2004) identified that Birtchnell's negative relating style was applicable to a hearer's relationship with their voice. Hayward (2003) extended these findings to explore associations between the unidirectional relating of the hearer to their voice and social others. These findings provide

evidence for the possible influence of interpersonal schema and the current empirical study findings offer further support for the role of schema. Broadly in line with Birtchnell's theory, our findings suggest that underlying core schemas in voice-hearers may underlie both the hearer's relating to their voice and their perception of the voice's relating to them. The perceived relationship between the hearer and their voice was influenced by their evaluations of themselves and others, rather than a unique attempt to manage the voice-hearing experience. Our findings suggest that underlying schema that guide interpersonal interactions, are activated and influence the relationship between the hearer and their voice. Our findings also support the proposal of Birchwood and Chadwick (1997), who suggested that the way in which voices are related to may reflect patterns of relating within the hearer's social world.

The Concept of 'Schema'

Schema are the central focus of both the systematic literature review and empirical study that form this thesis. The current literature review included a total of 23 research studies that measured underlying schema using one of two questionnaire measures, which operationalise schemas somewhat differently. The Young Schema Questionnaire Short-Form (YSQ-SF; Young, 1998) has 75 items and conceptualises schemas in a more complex way. The YSQ-SF assesses 15 types of core schemas held by an individual, in regard to the self, other people, and the world (e.g. schemas relating to mistrust/abuse, self-sacrifice, failure etc.). Whereas the Brief Core Schema Scales (BCSS; Fowler et al., 2006) distils schemas into four subscales of negative and positive evaluations of the self and others. Concurrent validity across the subscales of these measures has ranged from low to high (Fowler et al., 2006) and therefore, some subscales are potentially measuring different things. As such, this makes it difficult to directly compare the results of research studies that use different measures of schema. This therefore brings into question the coherence of the concept of 'schema' and

indicates the possibility of different findings, depending on how schema are measured. A further consideration is how distinct the concept of schema is from related concepts, such as beliefs, self-esteem, personality, and other variables measured within the empirical study (i.e. beliefs about voices and the relationship between the hearer and their voice).

Young (1995) defined ‘early maladaptive schema’ (EMS) as extremely stable and enduring themes. Such EMS are suggested to consist of cognitions, emotions, memories, and bodily sensations, and are understood to be developed in childhood and adolescence and elaborated upon throughout an individual’s lifetime (Young et al., 2003). The definition of EMS implies that maladaptive schema are in fact, ‘early’, however it is difficult to determine whether such schema measures are assessing anything early and how strongly linked maladaptive schema are to key childhood experiences in research studies. Furthermore, the definition assumes that EMS identified for an individual at one given time point will continue to be their primary EMS in the future. Thus, the stability of schema is inherent in the concept of EMS and research has found a stability of core schemas in other mental health difficulties (e.g. Riso et al., 2006). It remains possible however, that schema may alter over time. The fact that EMS are assumed to be elaborated upon implies that there may be changes over time based on new information and experiences. Research has found an increase in negative schema during the transition from an at-risk mental state to psychosis (Stowkowy et al., 2016), suggesting there may be an instability in core schemas. Nevertheless, there is minimal research assessing the stability of schemas across the psychosis continuum.

Implications for Clinical Practice

It is necessary to acknowledge that suggestions for the application of the thesis findings in clinical practice are made tentatively. This is primarily due to the preliminary state of the evidence included in the literature review; studies were largely limited to cross-

sectional designs, which was also the design employed by the current empirical study.

Overall, there is a clear need for further research to be conducted and suggestions for future studies are made later in this discussion paper.

Collectively, both papers suggest that negative schema may be elevated within psychosis, at-risk, and voice-hearing populations. Perhaps the most significant clinical implication to emerge from the current research is that it may be useful to assess for and to consider underlying schematic beliefs when working clinically with these populations. Clinicians should use a validated schema measure such as the BCSS (Fowler et al., 2006), which is a time efficient and accessible assessment of an individual's positive and negative evaluations of both the self and others. The BCSS may be a particularly useful assessment tool in time-pressured mental health services. Assessment of these broader schemas may assist clinicians in formulating the mechanisms that may be contributing to or maintaining the individual's presenting difficulties/psychotic symptoms in relation to voice-hearing and psychosis more generally. The findings of the current literature review suggest that this may be important, as the results indicate that there are a number of associations between particular schemas and symptoms of psychosis; overall the review paper findings indicated that particular schema may reflect or underlie specific psychotic symptomology. Additionally, the use of a schema assessment has the potential to open up a therapeutic dialogue to explore schematic beliefs further, which in turn may facilitate a richer therapeutic relationship and enable a more collaborative formulation to be devised.

The empirical study has added to the limited evidence-base and furthered the work by Thomas, Farhall and Shawyer (2015). The results indicate that core schema and their association with beliefs about voices are clinically relevant in voice-hearing populations. These findings reinforce the value of considering beliefs about voices as part of a clinical assessment and formulation, which has been indicated as important by previous researchers

(e.g. Thomas et al., 2015) and has been at the core of cognitive behavioural therapy (CBT) for psychosis since the work of Chadwick, Birchwood and Trower (1996). In clinical practice, the understanding of the voice-hearing experience may be enhanced by using formal measures to investigate the hearer's particular beliefs about voices in addition to underlying schemas. Schematic beliefs may be supporting an individual's beliefs about voices and therefore, there is a possibility that schemas may offer a parallel focus of intervention or an alternative intervention target when beliefs are held with strong conviction.

The National Institute for Health and Care Excellence (NICE; 2014) advises that CBT should be offered to individuals at-risk of developing psychosis and those diagnosed with psychosis. In clinical practice, CBT for voices focuses on engagement, individualised formulation, and encourages individuals to review the evidence of their beliefs about voices and challenge the accuracy of these beliefs. This is achieved using methods such as Socratic questioning and behavioural experiments (Morrison, Renton, Dunn, Williams, & Bentall, 2004). There have been some observed difficulties with challenging beliefs about voices using a CBT approach, for example, research has indicated that beliefs about voice intent as malevolent in particular are not easy to directly modify (e.g. Peters et al., 2010). The empirical study findings suggest that schemas that may be supporting these beliefs. Therefore, schemas offer a potential additional therapeutic target that require a deeper level of therapy and as such, schema focused interventions should be explored in future research.

Findings from the literature review offer preliminary support for the potential use of CBT intervention delivered on a one-to-one basis to target underlying self-schema in psychosis. A randomised-controlled trial (RCT) recruited participants experiencing persistent persecutory delusions; one group of participants received six individual CBT sessions in addition to standard care and one group received standard care only (Freeman et al., 2014). The intervention utilised cognitive techniques for reducing negative-schema and increasing

positive-self schema; positive activities were also encouraged. There was no attempt made to directly challenge or review the delusional beliefs. The CBT intervention produced short-term gains post-treatment: non-significant reductions in negative-self schema and paranoia were observed, and a significant increase in positive-self schema. None of these findings were maintained at the 12-week follow-up however. This study was promising and indicates the potential value of targeting self-schema in patients with persecutory delusions. As this finding was limited to one brief intervention study however, the evidence is in its early stages and is not yet robust enough to confidently recommend how a CBT intervention targeting underlying schema should be implemented in clinical practice, thus further research is necessary.

The empirical study also highlights the relevance of schemas when considering the perceived relationship between the hearer and their voice. It has been suggested that considering voice-hearing experiences through ongoing formulation enables individuals to make connections between their voice-hearing experience and past and present social relationships (Hayward & Fuller, 2010) and our results support that this may be valuable. Research has suggested that the Voice and You (VAY; Hayward, Denney, Vaughan, & Fowler, 2008) may be used as an adjunct to clinical interviewing in order to elicit a detailed interpersonal history and to encourage conversation about the relational nature of the voice-hearing experience and connections with past and present social relationships. Although therapies have been used to directly work on the relationship between the hearer and their voice (e.g. relating therapy; Birtchnell, 2002), our findings support an alternative route to modifying the relationship with the voice through accessing schemas. In regard to therapeutic implications, if the hearer's relationship with the voice is important then this should be a target of intervention. Researchers have described working at the level of social relating to attempt to improve the individual's social status or position, and therefore improve schema

(Birchwood, Meaden, Trower, Gilbert, & Plaistow, 2000). Thus, the empirical study findings are supportive of the potential of targeting underlying schema, to influence the relating style between the hearer and their predominant voice. Our study was however, the first to directly explore schemas and the relationship between the hearer and the voice. Further studies are necessary prior to suggesting firm changes in clinical practice.

Implications for Future Research

The literature review findings highlight areas for future research. It is important that the preliminary intervention study carried out by Freeman and colleagues (2014) is followed by further rigorous research utilising CBT schema change methods to target core schema, which may be underpinning psychotic symptoms and offers an alternative to directly challenging psychotic symptoms (e.g. beliefs about voices, delusions of grandiosity). In order to enhance the robustness of the evidence-base it would be beneficial for future researchers to consider the following: (1) use an RCT design; (2) administer validated measures of psychotic symptoms; (3) administer a validated measure of schema functioning and consider measuring both self *and* other-schema; (4) ensure the sample size has sufficient power to detect small-medium effect sizes; (5) utilise a CBT intervention and report sufficient detail of the intervention and techniques used in order facilitate replication; and (6) include a follow-up assessment to determine any long-term treatment gains.

Furthermore, the current literature review provides initial evidence to suggest particular schematic beliefs may be associated with *specific* positive psychotic symptoms (e.g. grandiose delusions, auditory verbal hallucinations, paranoia etc.). This has implications when designing future intervention studies. For example, research would benefit from recruiting participant samples by their specific symptoms (e.g. grandiose delusions) as opposed to diagnostic label (e.g. paranoid schizophrenia). When determining which

underlying schema to target through intervention (i.e. self, other, or particular EMS), findings from the literature review may be drawn upon as there was evidence to suggest that particular schemas are characteristic of certain symptoms and this may help provide a focused intervention.

The results of both the literature review (e.g. Freeman et al., 2014; Chung et al., 2013) and empirical study, collectively suggest that it may be important for interventions to aim to improve positive-self schema rather than attempting to challenge or erode negative schema. These findings possibly lend themselves well to alternative therapeutic approaches such as mindfulness-based therapies where there is a focus upon increasing self-compassion (e.g. Mayhew & Gilbert, 2008), which may be suited to intervening at a schematic level. Further intervention studies investigating the effectiveness of these interventions in altering underlying schema are necessary.

The current literature review provided initial evidence that negative schema increase at the time of transition from an at-risk mental state to a first episode psychosis, however findings were contradictory. Longitudinal research with at-risk clinical populations would enable firmer conclusions to be drawn regarding any changes in schema functioning, particularly at the time of transition. Future RCTs should also recruit at-risk samples; it may be particularly important to intervene early given the preliminary evidence to suggest that negative schema increase during transition.

Given the evidence to suggest that schema may be formed through early life experiences (e.g. Varese et al., 2012), it is unsurprising that strongly held fact-like negative core beliefs about the self can be difficult to alter, as indicated in Freeman et al's (2014) RCT. It may therefore be beneficial for future studies to lengthen the duration of the intervention as suggested by Freeman and colleagues (2014). Working therapeutically with schemas is not mentioned in the NICE guidelines (2014) and clinically it involves a deeper

level of therapy exploring the development of core schema through exploring early life and attachment relationships. Working with schemas requires a strong therapeutic relationship and intervention sessions are likely to exceed the 16 sessions recommended (NICE, 2014). It is therefore important for future research to test whether brief targeted interventions or longer-term intervention have more of an impact on altering core schema. There are various possible models for schema change methods, including schema-focused therapy and schema focused CBT that could be explored.

The thesis findings indicate a necessity to address underlying schema in the treatment of this clinical population. For individuals with severe, chronic psychological problems, studies included in the literature review paper lend support to schema therapy as a potential therapeutic approach. Schema therapy was developed for such individuals who do not make significant gains in traditional cognitive therapy (Young et al., 2003) and has shown promising findings throughout various mental health difficulties (Masley, Gillanders, Simpson, & Taylor, 2012). Future studies would need to test the rationale and explore its feasibility and possible adaptations made for this clinical population. However, it is important to note that although many researchers are recommending this based on their cross-sectional and case-control studies, this is to be considered in the future as there is currently a striking lack of intervention studies.

The current empirical paper indicated that female participants scored significantly higher on the negative beliefs about voices subscales and males reported more benevolent beliefs, suggesting that the voice-hearing experience may differ between genders. Our findings contrasted those reported by Thomas et al. (2015), who found no associations between gender and beliefs about voices. Male participants in our sample had significantly higher positive schema and fewer negative-self schema than females. It may be of interest for

future research to develop and test hypotheses regarding the underlying mechanism for potential gender differences.

In sum, the literature is in its infancy and further research utilising rigorous methodologies should be conducted to further the evidence-base. This would be a key step in moving towards more meaningful clinical applications of these thesis findings. Overall, the thesis findings provide sufficient support to suggest further clinical exploration of intervening at a schematic level, whilst progressing theoretical work and empirical research in parallel to determine the most appropriate intervention.

Reflective Commentary

Throughout my clinical training I have remained open-minded and willingly stepped out of my comfort zone to relish new experiences, which has facilitated my learning and professional development. Choosing to pursue this research study provided me with not only the prospect of working with passionate researchers and experts in the field but also the opportunity to expand my knowledge in a field that my curiosity, desire to learn and to challenge myself, instantly drew me to.

Before commencing data collection, I was aware of the demand I was to place on busy clinicians working in stretched teams, which I had witnessed first-hand when on placement in mental health services. I felt a sense of being out of control of my own research if I were to passively rely on other clinicians to identify participants and remember to ask them if they wished to take part, which did not sit comfortably with me and my nature. I am often praised on my planning and organisation skills and in an attempt to keep my anxiety at bay, regain some control and to push forward with recruitment, I took the initiative to make myself present in teams; I connected with clinicians, showed an interest in their role and in return, they happily made time to speak more about my research. Following this I noticed a

steady rise in the pace of recruitment, which consolidated the importance of using initiative when conducting clinical research.

Beyond engaging clinicians in the research, I was aware that I was yet to engage a population of individuals who, I was told, are notoriously difficult to recruit for research. Many potential participants that I came into contact with were understandably anxious about meeting someone new, highly distressed by their experience of hearing voices, or wary of the shopping voucher that they would receive for taking part—I was completely surprised that this, what I thought of as an expression of gratitude, led some people to decline taking part—this provided me with a useful clinical insight into the client group’s concerns about the intentions of others. Despite these challenges I was overwhelmed by the response, recruiting more participants than I had initially imagined possible. I reflected on my core clinical skills as being invaluable to putting participants at ease throughout the process. My clinical experience informed me as to when participants were finding the questionnaires overwhelming and possibly having difficulty sustaining concentration; I worked flexibly and offered participants breaks where needed. Some individuals were keen to offer additional qualitative insights into their experiences beyond the questionnaire measures. Having had limited clinical contact with individuals who experience hearing voices, I was intrigued by their reflections. I ensured I allowed them a safe space and listened curiously, whilst maintaining an awareness of the temptation to slip into the role of a therapist beyond the boundaries of being a quantitative researcher.

Arguably the most difficult part of the recruitment process for me personally was the geographical distance covered to meet with each participant. It was fairly typical that I would spend an entire day driving across North Wales and meet with only two participants that day; living in England for the duration of my training undoubtedly made this increasingly challenging. Whilst on the road I would feel a sense of frustration and ruminate on how the

time driving was 'wasted'. I would worry that I was falling behind schedule with my research timeline and in the many hours alone with my thoughts I would find myself continually comparing my progress with where I had hoped I would be at this point in my research timeline. When eventually reaching my destination and meeting with participants my anxiety lessened. I was welcomed into their homes or struck by their commitment to attending the research appointment, and I found myself fascinated by their stories. I found it inspirational that despite their own mental health struggles, all participants hoped to help others with similar experiences, which had driven their wish to participate in the research. I felt incredibly privileged to meet each participant.

Following the sigh of relief at achieving an ambitious participant sample, I was then confined to my home office to complete data analysis, which posed a new set of challenges. Being a novice to quantitative research, engaging in an unfamiliar approach evoked overwhelming anxiety. Although I was inspired by the opportunity to further develop my research skills within a new method, I noticed how I felt daunted by the prospect. I regularly questioned whether my desire to challenge myself had been the wisest decision, when feeling somewhat lost in data and literature that I had no prior knowledge of. I made use of mindfulness skills to ensure I savoured the times where I noticed I had learnt something new or had completed a difficult task. I continually used supervision to reflect on the process of research, both the challenges and rewards, which encouraged me to be self-compassionate.

Overall this research process has been one full of challenges and fulfilment and it has no doubt sparked a desire within me to actively seek out opportunities to engage in research throughout my career. I will endeavour to continue persevering with new challenges in the hope of fulfilling my desire to continually grow both personally and professionally in my future career as a Clinical Psychologist.

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Appendices

Appendix A: Bangor University School of Psychology Ethical Approval Confirmation

Ethical approval granted for 2018-16274 Beliefs about Voices in Psychosis: The Role of Schema Functioning.



ethics@bangor.ac.uk

Thu 12/07/2018, 11:03

Brittany Davenport



Reply all

Inbox

You replied on 12/07/2018 14:11.

Dear Brittany,

2018-16274 Beliefs about Voices in Psychosis: The Role of Schema Functioning.

Your research proposal number 2018-16274

has been reviewed by the Psychology Ethics and Research Committee

and the committee are now able to confirm ethical and governance approval for the above research on the basis described in the application form, protocol and supporting documentation. This approval lasts for a maximum of three years from this date.

Ethical approval is granted for the study as it was explicitly described in the application

if you wish to make any non-trivial modifications to the research project, please submit an amendment form to the committee, and copies of any of the original documents reviewed which have been altered as a result of the amendment. Please also inform the committee immediately if participants experience any unanticipated harm as a result of taking part in your research, or if any adverse reactions are reported in subsequent literature using the same technique elsewhere.

Appendix B: Betsi Cadwaladr University Health Board HRA and Health and Care Research Wales Ethical Approval Confirmation



Miss Brittany Joy Davenport
Trainee Clinical Psychologist
Betsi Cadwaladr University Health Board
North Wales Clinical Psychology Programme
School of Psychology, Bangor University
Bangor, Gwynedd
LL57 2DG

30 August 2018

Dear Miss Davenport



Email:
Research-permissions@wales.nhs.uk

HRA and Health and Care Research Wales (HCRW) Approval Letter

Study title:	Beliefs about Voices in Psychosis: The Role of Schema Functioning.
IRAS project ID:	247414
Protocol number:	N/A
REC reference:	18/WA/0264
Sponsor	School of Psychology, Bangor University

I am pleased to confirm that [HRA and Health and Care Research Wales \(HCRW\) Approval](#) has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

How should I continue to work with participating NHS organisations in England and Wales?
You should now provide a copy of this letter to all participating NHS organisations in England and Wales, as well as any documentation that has been updated as a result of the assessment.

Following the arranging of capacity and capability, participating NHS organisations should **formally confirm** their capacity and capability to undertake the study. How this will be confirmed is detailed in the "summary of assessment" section towards the end of this letter.

You should provide, if you have not already done so, detailed instructions to each organisation as to how you will notify them that research activities may commence at site following their confirmation of capacity and capability (e.g. provision by you of a 'green light' email, formal notification following a site initiation visit, activities may commence immediately following confirmation by participating organisation, etc.).

It is important that you involve both the research management function (e.g. R&D office) supporting each organisation and the local research team (where there is one) in setting up your study. Contact details of the research management function for each organisation can be accessed [here](#).

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?

HRA and HCRW Approval does not apply to NHS/HSC organisations within the devolved administrations of Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report (including this letter) has been sent to the coordinating centre of each participating nation. You should work with the relevant national coordinating functions to ensure any nation specific checks are complete, and with each site so that they are able to give management permission for the study to begin.

Please see [IRAS Help](#) for information on working with NHS/HSC organisations in Northern Ireland and Scotland.

How should I work with participating non-NHS organisations?

HRA and HCRW Approval does not apply to non-NHS organisations. You should work with your non-NHS organisations to [obtain local agreement](#) in accordance with their procedures.

What are my notification responsibilities during the study?

The document "*After Ethical Review – guidance for sponsors and investigators*", issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- Registration of research
- Notifying amendments
- Notifying the end of the study

The [HRA website](#) also provides guidance on these topics, and is updated in the light of changes in reporting expectations or procedures.

I am a participating NHS organisation in England or Wales. What should I do once I receive this letter?

You should work with the applicant and sponsor to complete any outstanding arrangements so you are able to confirm capacity and capability in line with the information provided in this letter.

The sponsor contact for this application is as follows:

Name: Brittany Davenport
Tel: 07518102326
Email: psp@3d@bangor.ac.uk

Who should I contact for further information?

Please do not hesitate to contact me for assistance with this application. My contact details are below.

Your IRAS project ID is 247414. Please quote this on all correspondence.

IRAS project ID	247414
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Yours sincerely

Ann Parry (Health and Care Research Wales)
Permissions Service Manager (acting)

Email: Research-permissions@wales.nhs.uk

Copy to: *Mr Huw Ellis, Bangor University*
Dr Rosella Roberts, Betsi Cadwaladr University Health Board
Dr Michelle Rydon-Grange, Betsi Cadwaladr University Health Board
Dr Mike Jackson, Bangor University

List of Documents

The final document set assessed and approved by HRA and HCRW Approval is listed below.

Document	Version	Date
Evidence of Sponsor Insurance or Indemnity (non NHS Sponsors only)		16 July 2018
HRA Schedule of Events	1	21 August 2018
HRA Statement of Activities	1	21 August 2018
IRAS Application Form (IRAS_Form_18072018)		18 July 2018
Non-validated questionnaire [Demographic questionnaire]	1.0	25 June 2018
Other [Initial contact form]	1.0	08 June 2018
Other [Thomas et al (2013) paper]	1.0	22 June 2018
Participant consent form [Consent form]	1.0	16 March 2018
Participant Information sheet (PIS)	3	29 August 2018
Research protocol or project proposal [Research protocol or project proposal]	1.0	22 June 2018
Summary CV for Chief Investigator (CI) [Chief Investigator CV]	1.0	09 June 2018
Summary CV for supervisor (student research) [Academic and Research Supervisor CV]	1.0	09 June 2018
Summary CV for supervisor (student research) [Dr Michelle Rydon-Grange CV]	1.0	12 June 2018
Validated questionnaire [Brief Core Schema Scale - Beliefs about the self and others]	1.0	12 June 2018
Validated questionnaire [The VAY questionnaire]	1.0	12 June 2018
Validated questionnaire [The revised beliefs about voices questionnaire]	1.0	12 June 2018
Validated questionnaire [The Interpretation of Voices Inventory]	1.0	22 June 2018
Validated questionnaire [The Psychotic Symptom Rating Scales Auditory Hallucinations Subscale]	1.0	22 June 2018

Summary of assessment

The following information provides assurance to you, the sponsor and the NHS in England and Wales that the study, as assessed for HRA and HCRW Approval, is compliant with relevant standards. It also provides information and clarification, where appropriate, to participating NHS organisations in England and Wales to assist in assessing, arranging and confirming capacity and capability.

Assessment criteria

Section	Assessment Criteria	Compliant with Standards	Comments
1.1	IRAS application completed correctly	Yes	No comments
2.1	Participant information/consent documents and consent process	Yes	No comments
3.1	Protocol assessment	Yes	No comments
4.1	Allocation of responsibilities and rights are agreed and documented	Yes	The sponsor has submitted a Statement of Activities and Schedule of Events and intends that these act as the agreement with sites
4.2	Insurance/indemnity arrangements assessed	Yes	No comments
4.3	Financial arrangements assessed	Yes	No external funding has been sought and no funding will be provided to sites
5.1	Compliance with the Data Protection Act and data security issues assessed	Yes	No comments
5.2	CTIMPS – Arrangements for compliance with the Clinical Trials Regulations assessed	Not Applicable	No comments
5.3	Compliance with any applicable laws or regulations	Yes	No comments
6.1	NHS Research Ethics Committee favourable opinion received for applicable studies	Yes	No comments

IRAS project ID	247414
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Section	Assessment Criteria	Compliant with Standards	Comments
6.2	CTIMPS – Clinical Trials Authorisation (CTA) letter received	Not Applicable	No comments
6.3	Devices – MHRA notice of no objection received	Not Applicable	No comments
6.4	Other regulatory approvals and authorisations received	Not Applicable	No comments

Participating NHS Organisations in England and Wales

<i>This provides detail on the types of participating NHS organisations in the study and a statement as to whether the activities at all organisations are the same or different.</i>
<p>1 site type – All activities</p> <p>The Chief Investigator or sponsor should share relevant study documents with participating NHS organisations in England and Wales in order to put arrangements in place to deliver the study. The documents should be sent to both the local study team, where applicable, and the office providing the research management function at the participating organisation. Where applicable, the local LCRN contact should also be copied into this correspondence.</p> <p>If chief investigators, sponsors or principal investigators are asked to complete site level forms for participating NHS organisations in England and Wales which are not provided in IRAS, the HRA or HCRW websites, the chief investigator, sponsor or principal investigator should notify the HRA immediately at hra.approval@nhs.net or HCRW at Research-permissions@wales.nhs.uk. We will work with these organisations to achieve a consistent approach to information provision.</p>

Principal Investigator Suitability

<i>This confirms whether the sponsor position on whether a PI, LC or neither should be in place is correct for each type of participating NHS organisation in England and Wales, and the minimum expectations for education, training and experience that PIs should meet (where applicable).</i>
<p>PI should be in place for the conduct of the study, for each research site opened</p> <p>GCP training is <u>not</u> a generic training expectation, in line with the HRA/HCRW/MHRA statement on training expectations.</p>

HR Good Practice Resource Pack Expectations

<i>This confirms the HR Good Practice Resource Pack expectations for the study and the pre-engagement checks that should and should not be undertaken</i>
<p>No Honorary Research Contracts, Letters of Access or pre-engagement checks are expected for local staff employed by the participating NHS organisations. Where arrangements are not already in</p>

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IRAS project ID	247414
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place, research staff not employed by the NHS host organisation undertaking any of the research activities listed in the research application would be expected to obtain a Letter of Access based on standard DBS checks and occupational health clearance.

Other Information to Aid Study Set-up

This details any other information that may be helpful to sponsors and participating NHS organisations in England and Wales to aid study set-up.

The applicant has indicated that they do not intend to apply for inclusion on the NIHR CRN Portfolio.

Appendix C: Betsi Cadwaladr University Health Board Research Ethics Committee Approval Letter



**Gwasanaeth Moeseg Ymchwil
Research Ethics Service**



**Wales Research Ethics Committee 5
Bangor**

Mailing address:
Health and Care Research Wales
Castlebridge 4
15-19 Cowbridge Road East
Cardiff, CF11 9AB

telephone: 02920 785736; 07825 244673
email: WalesREC5@wales.nhs.uk
website: www.hra.nhs.uk

Please note:
**This is the favourable opinion of the
REC only and does not allow you to
start your study at NHS sites in
England and Wales until you receive
HRA/HCRW Approval**

28 August 2018

Miss Brittany Joy Davenport
Trainee Clinical Psychologist
Betsi Cadwaladr University Health Board
North Wales Clinical Psychology Programme
School of Psychology, Bangor University
Bangor, Gwynedd
LL57 2DG

Dear Miss Davenport,

Study title:	Beliefs about Voices in Psychosis: The Role of Schema Functioning.
REC reference:	18/WA/0264
IRAS project ID:	247414

The Research Ethics Committee reviewed the above application at the meeting held on 16 August 2018.

The Committee wishes to thank you and your Academic Supervisor, Dr Mike Jackson, for attending to discuss the application.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this favourable opinion letter. The expectation is that this information will be published for all studies that receive an ethical opinion but should you wish to provide a substitute contact point, wish to make a request to defer, or require further information, please contact hra.studyregistration@nhs.net outlining the reasons for your request.

Under very limited circumstances (e.g. for student research which has received an unfavourable opinion), it may be possible to grant an exemption to the publication of the study.

Ethical opinion

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

Conditions of the favourable opinion

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

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

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

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

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

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

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

Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database. This should be before the first participant is recruited but no later than 6 weeks after recruitment of the first participant.

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g. when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non-clinical trials this is not currently mandatory.

If a sponsor wishes to request a deferral for study registration within the required timeframe, they should contact hra.studyregistration@nhs.net. The expectation is that all clinical trials will be registered, however, in exceptional circumstances non registration may be permissible with prior agreement from the HRA. Guidance on where to register is provided on the HRA website.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Ethical review of research sites

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

Extract of the meeting minutes

Ethical issues raised by the Committee in private discussion, together with responses given by the researchers when invited to join the meeting

The Chairman welcomed the applicants and introduced the Committee members.
The following issues were discussed:

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

The Committee discussed whether the design and methodology makes use of accepted scientific principles and methods to produce reliable and valid data, and concluded that the conduct of the study is appropriately described in the protocol, the study design robust and the proposed analysis adequate to answer the research question.

A clarification was requested in relation to the inclusion of a definition of schema in the study aims and objectives.

The Chief Investigator clarified that 'schema' is defined as the sum of underlying assumptions about ourselves and the world that we develop through experiences. As the protocol was developed for an expert audience a definition was not included.

Informed Consent process and the adequacy and completeness of participant information

The Committee noted that the IRAS application form states that the research team will not inform the GP of the patient's participation in the study – whilst the Participant Information Sheet takes consent to inform the GP.

Dr Jackson clarified that the study team did not deem relevant to inform the GP of the patient's participation in the study as it is not a clinical intervention. However, if participants disclose an issue that may be of concern, the GP and the clinical team will be informed.

Suitability of supporting information

The Committee discussed the suitability of the questionnaires and noted that the option 'prefer not to say' was included for all items except for 'ethnic background' and requested a clarification on whether this is a mandatory item.

Ms Davenport confirmed that no items on the questionnaire are compulsory – the absence of the 'prefer not to say' box is an editing error.

A further clarification was requested in relation to the data being requested on the medication taken by participants.

Dr Jackson confirmed that the study will not be looking at the effect of the medication, but the data will give the research team an idea of the treatment regimen.

The Committee thanked Miss Davenport and Dr Jackson for their availability to speak to this submission and gave them an opportunity to ask questions. The applicants did not raise any issues.

Other ethical issues were raised and resolved in preliminary discussion before your attendance at the meeting.

- Recruitment arrangements and access to health information; fair participant selection
- Favourable risk benefit ratio; anticipated benefit/risks for research participants
- Care and protection of research participants; respect for participants' welfare and dignity; data protection and confidentiality
- Suitability of the applicant and supporting staff
- Independent review
- Other study procedures
- Other general comments missing information/ typographical errors/ application errors/
- Suitability of the study summary

Please contact the REC Manager if you feel that the above summary is not an accurate reflection of the discussion at the meeting.

Approved documents

The documents reviewed and approved at the meeting were:

Document	Version	Date
Evidence of Sponsor Insurance or Indemnity		16 July 2018
IRAS Application Form [IRAS_Form_18072018]		18 July 2018
Non-validated questionnaire [Demographic questionnaire]	1.0	25 June 2018
Other [Initial contact form]	1.0	08 June 2018
Other [Thomas et al (2013) paper]	1.0	22 June 2018
Participant consent form [Consent form]	1.0	16 March 2018
Participant information sheet (PIS) [Participant information leaflet]	2.0	08 June 2018
Research protocol or project proposal [Research protocol or project proposal]	1.0	22 June 2018
Summary CV for Chief Investigator (CI) [Chief Investigator CV]	1.0	09 June 2018
Summary CV for supervisor (student research) [Academic and Research Supervisor CV]	1.0	09 June 2018
Summary CV for supervisor (student research) [Dr Michelle Rydon-Grange CV]	1.0	12 June 2018
Validated questionnaire [Brief Core Schema Scale - Beliefs about the self and others]	1.0	12 June 2018
Validated questionnaire [The VAY questionnaire]	1.0	12 June 2018
Validated questionnaire [The revised beliefs about voices questionnaire]	1.0	12 June 2018
Validated questionnaire [The Interpretation of Voices Inventory]	1.0	22 June 2018
Validated questionnaire [The Psychotic Symptom Rating Scales Auditory Hallucinations Subscale]	1.0	22 June 2018

Membership of the Committee

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

No declarations of interest were made in relation to this application.

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

After ethical review

Reporting requirements

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

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

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

User Feedback

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

HRA Training

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

18/WA/0264

Please quote this number on all correspondence

With the Committee's best wishes for the success of this project.

Yours sincerely

Dr Philip Wayman White, MBChB, FRSM
General Practitioner
Chair Wales REC 5

E-mail: WalesREC5@wales.nhs.uk

Enclosures:

List of names and professions of members who were present at the meeting and those who submitted written comments

"After ethical review – guidance for researchers"



SL-AR2 After ethical
review - research oth

Copy to:

Mr Huw Ellis, Bangor University
Miss Debra Slater, Betsi Cadwaladr University Health Board,
research-permissions@wales.nh.uk

Wales REC 5

Attendance at Committee meeting on 16 August 2018

Committee Members:

<i>Name</i>	<i>Profession</i>	<i>Present</i>
Dr Swapna Alexander	Consultant Physician	No
Mrs Kathryn Chester	Research Nurse	No
Ms Geraldine Jenson	Retired College Vice-Principal	No
Mr David Rhys Jones	Retired Science Teacher, Head of Physics	Yes
Mr Eliezer Lichtenstein	Postgraduate Student	No
Dr Pamela Ann Martin-Forbes	Clinical Studies Officer	Yes
Dr Paul Mullins	Reader, MRI Physicist (Alternate Vice-Chair)	Yes
Mr Vishwanath Puranik	Consultant ENT Surgeon	No
Mrs Lynn Christine Roberts	Matron Emergency Department	No
Dr Judith L Roberts	Lecturer, Clinical Psychologist	Yes
Dr Jason Donal Walker	Consultant Anaesthetist (Vice-Chair)	Yes
Dr Philip Wayman White	General Practitioner (Chair)	Yes
Ms Sydna Ann Williams	Retired Lecturer, College Principal	Yes

Also in attendance:

<i>Name</i>	<i>Position (or reason for attending)</i>
Mr Norbert Leon Ciumageanu	Research Ethics Service Administrative Assistant
Dr Rossela Roberts	Research Ethics Service Manager

Appendix D: Participant Information Sheet



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Bwrdd Iechyd Prifysgol
Betsi Cadwaladr
University Health Board

North Wales Clinical Psychology Programme/Rhaglen
Seicoleg Clinigol Gogledd Cymru
Room 246, Brigantia Building
School of Psychology/Ysgol Seicoleg
Bangor University/Prifysgol Bangor
Bangor, Gwynedd, LL57 2AS
Telephone: 01248 382205



PARTICIPANT INFORMATION LEAFLET

Study Title: Beliefs about Hearing Voices: The Role of Previous Experiences and Underlying Assumptions

Researchers: Brittany Davenport, Trainee Clinical Psychologist (NWCPP)
Dr. Michelle Rydon-Grange, Lead Psychologist (Elysium Healthcare)
Dr. Mike Jackson, Consultant Clinical Psychologist (BCUHB).

We would like to invite you to take part in a research study to help us find out more about how people who hear voices make sense of their voice(s). In particular, we are interested in whether the beliefs that people have about their voice(s) is related to the experiences they may have had during their lives. This leaflet gives you more information about the study. Please read it carefully before deciding whether you would like to take part.

If after reading this leaflet you decide you would like to participate, please complete and return the Initial Contact Form using the pre-stamped and addressed envelope provided or alternatively, you can let your treating clinician know that you would like to take part. One of the researchers will then contact you to answer any questions you have and to arrange a convenient time to meet with you.

What is the purpose of the study?

The purpose of this study is to look at the relationship between voice "hearers" beliefs about their voice(s), and schemas. Schemas are the underlying ideas or assumptions we have about ourselves, other people, and the world. This study intends to help with developing psychological therapy for people who hear voices.

If you decide to take part in this research study, you will be asked to complete six questionnaires asking you about your experience of hearing voices, your beliefs about your voice(s), and general beliefs you may hold about yourself and others.

Who is carrying out this research?

Brittany Davenport is training to become a Doctor of Clinical Psychology at Bangor University, on the North Wales Clinical Psychology Programme (NWCPP). Brittany is the researcher who will meet with you if you agree to take part, and can answer any questions you may have. The research team is made up of Brittany; Dr. Michelle Rydon-Grange, Lead Psychologist based at Ty Grosvenor, Elysium Healthcare; and Dr. Mike Jackson a Consultant Clinical Psychologist, who is based at the Early Intervention in Psychosis Service Betsi Cadwaladr University Health Board



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University Health Board



North Wales Clinical Psychology Programme
Rhaglen Seicoleg Clinigol Gogledd Cymru

(BCUHB) and is also the Research Director at Bangor University, NWCPP. Dr. Michelle Rydon-Grange and Dr. Mike Jackson are Brittany's supervisors.

Why have I been invited?

We are inviting people who *currently* experience hearing voices and have experienced hearing voices for *at least one year* to date, and have also had some support from mental health services during this period. We have asked your usual clinician to pass on this information, and to invite you to take part. We do not have any personal information about you at this time.

Do I have to take part?

No. It is up to you if you decide whether or not to take part.

Before you decide, we ask you to read this information leaflet. If there is anything that is not clear or if you would like more information, please ask the researcher, Brittany, or contact the research staff (contact details given at the end of this leaflet). If you decide not to take part, *you do not need to give a reason*, and the standard of care you receive will not be affected in any way.

What are the possible benefits of taking part?

We wouldn't want people to take part simply for financial gain, however, if you decide to take part in the study and complete the questionnaires, you will receive a shopping voucher worth £10 for contributing your time. Learning more about the experiences of hearing voices depends on what individuals describe of their own personal experience, therefore you will be contributing to a wider understanding about hearing voices and helping to develop appropriate psychological treatments. You will also be contributing to the hands-on training of a new, professional Clinical Psychologist, with an interest in this field.

What are the possible disadvantages of taking part?

This study does not involve any direct risks. You will need to spend some time reading this information leaflet, filling-in a number of questionnaires, and talking briefly with the researcher. Your information will be completely anonymous and confidential, unless certain circumstances means we need to speak to anyone else (see below).

If the information discussed during your meeting with the researcher suggests that you are experiencing significant levels of emotional distress, triggered by taking part in this research, a member of the research team will offer support and if necessary, will ask for your consent to inform your GP of this. We may also ask for your consent to refer you to the clinician you are seeing to discuss any emotional difficulties you are experiencing.

How will my treatment be affected?

Whether or not you decide to participate in the study, your treatment will not be affected in any way. You can decide to withdraw from the study at any time, without your treatment being affected in any way.



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How do I volunteer to take part in the research study?

If you would like to take part, please complete the Initial Contact Form that you have been provided with and post the form to Brittany using the pre-stamped and addressed envelope provided. Upon receipt, Brittany will then get in touch to discuss any questions you may have, and to arrange a convenient time to meet so that you can complete some questionnaires. If for any reason it is difficult for you to complete and return the Initial Contact Form, alternatively, you can let your clinician know that you would like to be contacted about the research, they will then provide your contact details to Brittany.

If you decide to take part, you will be asked to sign and date a 'consent form', which is your written agreement to take part in the research. You will receive a copy of the form, to keep for your records. If you decide to withdraw, any information we have collected as part of the study will be securely destroyed in line with BCUHB policy.

What will happen if I decide to take part?

If you decide to take part in the research study, you will meet with Brittany, and you will be asked to complete six questionnaires:

- The first questionnaire will ask you to provide some basic information about yourself, including your age, gender, ethnicity, first language, educational level; employment status, your current psychiatric diagnosis if you have one, duration of diagnosis, length of time hearing voices, and medication status.
- One questionnaire will ask you questions about your voice-hearing experience
- Three questionnaires will ask you about the beliefs you hold about your voices
- One questionnaire will ask you about general beliefs you may hold about yourself and others.]

Please note, to enable the researchers to find out more about your voice hearing experience (e.g. length of time hearing voices or accessing services etc.) relevant sections of your medical notes may be looked at.

Completing these questionnaires will take around 60 minutes. There will be regular pauses in which you can take a short break. The researcher will only need to meet with you on one occasion to complete these questionnaires and will remain present during the meeting to clarify/answer any questions you may have.

If you decide to take part in the research, you will be asked to come and meet the researcher at the service base that you are currently attending. You are welcome to bring along a family member/friend. If you would like to take part in the research but are unable to come to the service base you usually attend, the researcher will arrange to come and visit you at a suitable location of your choice (e.g. a local GP surgery), or the researcher may be able to visit you at home in some instances.



Bwrdd Iechyd Prifysgol
Betsi Cadwaladr
University Health Board



North Wales Clinical Psychology Programme
Rhaglen Seicoleg Clinigol Gogledd Cymru

What will happen to the results of the study?

The data collected from you and other participants will be used for academic research into hearing voices, and the results of the study may be published in the form of journal articles and conference presentations. It will not be possible to identify you, personally, in any research publications. The data collected will be published in the form of group averages, and there will be no reference to your individual scores. If you decide to participate in the research study, you will receive a brief newsletter once the study is completed, explaining the main results of the study. Additionally, you could ask one of the researchers to explain the results to you individually.

Who will have access to this information about me?

Your personal details will remain strictly confidential. Your name is only recorded for consent purposes and so that the research team can contact you (e.g. with the results of the research). Your data can only be identified with your unique reference number. Additional confidential safeguards will be used, including keeping your consent form, and paper copies of questionnaires, in a locked filing cabinet. Any computer data will be stored on a password-protected computer, based at Bangor University.

Your consent form will be retained during the process of conducting the study. All data will be retained by the research supervisor (Dr. Mike Jackson) for a minimum of 5 years, after which time they will be safely disposed in line with BCUHB policy.

Will my information be kept confidential?

Yes. Any information collected about you during this research study will be kept strictly confidential. At the beginning of the research, you will be assigned a random number, which will be your unique identification number throughout the study. The information about you can only be identified by this unique identification number known only to the researchers. Your research data (i.e. the scores on the questionnaires) will be collected by the researcher. This data will not be in any way linked to your personal details (e.g. name, address etc.).

If, at any time during the study, you disclose any incidents where professionals have acted in an unethical or abusive way towards you, the researcher has a *statutory (i.e. legal) requirement* to breach confidentiality. This means that the researcher cannot keep this information confidential, and is required to report this information to the appropriate responsible person or authority. Whenever practicable, the researcher will inform you that they will be breaching confidentiality by disclosing the information you have provided. The researcher can disclose this information without your explicit consent, if it is deemed in your best interest, or the best interest of the public, to do so.

If you are age 16 or 17 years and you talk about something that suggests that you or another young person may be at risk of harm, abuse or neglect, then child protection and safeguarding policies will be initiated by the researcher to ensure your safety.

Bangor University is the sponsor for this study based in North Wales. We will be using information from you and your medical records in order to undertake this study and will act as the data controller for this study. This means that we are responsible for looking after your information and



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using it properly. Bangor University will keep identifiable information about you for the purpose of the study for 5 years after the study is completed. This information will be held by Bangor University and BCUHB.

BCUHB will collect information from you and your medical records for this research study in accordance with our instructions. BCUHB will keep your name, and contact details confidential and will not pass this information to Bangor University. BCUHB will use this information as needed, to contact you about the research study, and make sure that relevant information about the study is recorded for your care, and to oversee the quality of the study. Certain individuals from Bangor University and regulatory organisations may look at your medical and research records to check the accuracy of the research study. Bangor University will only receive information without any identifying information. The people who analyse the information will not be able to identify you and will not be able to find out your name, or contact details. BCUHB will keep identifiable information about you from this study for 5 years after the study is completed.

Your information could be used for research in any aspect of health or care, and could be combined with information about you from other sources held by researchers, the NHS or government. Where this information could identify you, the information will be held securely with strict arrangements about who can access the information. The information will only be used for the purpose of health and care research, or to contact you about future opportunities to participate in research. It will not be used to make decisions about future services available to you, such as insurance. Where there is a risk that you can be identified your data will only be used in research that has been independently reviewed by an ethics committee.

Who is funding and organising the research?

This research is organised and funded by the North Wales Clinical Psychology Programme, at Bangor University.

Who has reviewed the study?

All research in the NHS is looked at by an independent group of people, called a Research Ethics Committee. This study has been reviewed and given a favourable opinion by the Wales Research Ethics Committee.

What if something goes wrong?

If you have a concern about any aspect of this study, you should speak to the research team, who will do their best to answer your questions. You should contact Brittany Davenport at psp03d@bangor.ac.uk. You can also contact either Dr. Michelle Rydon-Grange, Lead Psychologist (Telephone: 01978 807378 or email Michelle.Rydon-Grange@elysiumhealthcare.co.uk), or Dr. Mike Jackson, Consultant Clinical Psychologist (Telephone: 01248 388746 or email mike.jackson@bangor.ac.uk).

If you still remain unhappy about the research and/or wish to raise a complaint about any aspect of the way that you have been approached or treated during the course of the study, please contact



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Mr. Huw Ellis, who is the Bangor University contact for complaints regarding research, at the following address:

Mr. Huw Ellis, School of Psychology Manager, School of Psychology, Brigantia Building, Penrallt Road, Gwynedd, LL57 2DG.

Tel: 01248 388 339

E-mail: huw.ellis@bangor.ac.uk

For further information on any aspect of the study, please contact:

Brittany Davenport, Trainee Clinical Psychologist, North Wales Clinical Psychology Programme, Bangor University, 45 College Road, Bangor, Gwynedd, LL57 2DG

E-mail: psp93d@bangor.ac.uk

Thank you for taking the time to read this information leaflet.

Appendix E: Participant Initial Contact Form



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North Wales Clinical Psychology
Programme/Rhaglen Seicoleg Clinigol
Gogledd Cymru
Room 246, Brigantia Building
School of Psychology/Ysgol Seicoleg
Bangor University/Prifysgol Bangor
Bangor, Gwynedd
LL57 2AS
Telephone: 01248 382205



INITIAL CONTACT FORM

Research title: Beliefs about Hearing Voices: The Role of Previous Experiences and Underlying Assumptions.

Name of researcher: Brittany Davenport (Trainee Clinical Psychologist, North Wales Clinical Psychology Programme, Bangor University).

Supervised by: Dr. Michelle Rydon-Grange (Lead Psychologist, Elysium Healthcare) and Dr. Mike Jackson (Consultant Clinical Psychologist, BCUHB and Bangor University).

If you are interested in participating in our research, **please complete this form and return to Brittany Davenport using the stamped and addressed envelope provided, within one month of receipt.** Brittany will then contact you to discuss the research further and arrange to meet with you if you decide to participate.

Please put your initials in the box:

I agree to be contacted to discuss the research study

Your name (*please print*):

Your signature:

Your contact address and postcode:

The best telephone number to contact you on:

Thank you for considering participating in this research study. I look forward to speaking with you in the near future.

Brittany Davenport.

Appendix F: Participant Consent Form



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University Health Board



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Clinigol Gogledd Cymru
Room 246, Brigantia Building
School of Psychology/Ysgol Seicoleg
Bangor University/Prifysgol Bangor
Bangor
Gwynedd
LL57 2AS
Telephone: 01248 382205

PARTICIPANT CONSENT FORM

Study Title: Beliefs about Hearing Voices: The Role of Previous Experiences and Underlying Assumptions

Please initial each box if you agree with the statement

1. I confirm that I have read and understood the information sheet 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 without giving a reason, without my medical care or legal rights being affected. ☐
3. I understand that relevant sections of my medical notes may be looked at by the research team (i.e. Brittany Davenport, Dr. Michelle Rydon-Grange and Dr. Mike Jackson). I give permission for these individuals to have access to my medical records. ☐
4. I understand that my general practitioner and clinical specialist will be informed of my participation in this study if the research team become concerned about my emotional wellbeing. ☐
5. I understand that data collected about me during this study will be anonymised before it is submitted and/or included in any publications arising from the study. ☐
6. I agree to take part in this study. ☐

.....
Name of participant

.....
Date

.....
Signature

.....
Researcher

.....
Date

.....
Signature

V.2.1

Project ID 247414

05.09.2018

Appendix G: Demographic Information Questionnaire



Background Information Questionnaire

As part of the research study, we would like to gather some further information about you and your experience of hearing voices. Please read and answer the following questions. Some questions require you to select one of the options available and tick your response, other questions require you to write down your answer.

About you

1. Age: _____

2. Gender

Male	<input type="checkbox"/>
Female	<input type="checkbox"/>
Non-binary/third gender	<input type="checkbox"/>
Prefer not to say	<input type="checkbox"/>

Please tick your response

3. Ethnic group

White British	<input type="checkbox"/>
White Irish	<input type="checkbox"/>
White Other	<input type="checkbox"/>
Black (African Origin)	<input type="checkbox"/>
Black (Caribbean Origin)	<input type="checkbox"/>
Black Other	<input type="checkbox"/>
Asian (Indian Origin)	<input type="checkbox"/>
Asian (Pakistani Origin)	<input type="checkbox"/>
Asian (Bangladeshi Origin)	<input type="checkbox"/>
Asian (Chinese Origin)	<input type="checkbox"/>
Asian (Other)	<input type="checkbox"/>
White and Black Caribbean	<input type="checkbox"/>
White and Black African	<input type="checkbox"/>
White and Asian	<input type="checkbox"/>
Mixed Other	<input type="checkbox"/>
Other Ethnic Group	<input type="checkbox"/>
Prefer not to say	<input type="checkbox"/>

Please tick your response

Project ID 247414

Version 2.0

02.09.18

4. What is the first language that you speak?

5. If your first language is not English, can you speak English fluently?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>
Not applicable to me as English is my first language	<input type="checkbox"/>

Please tick your response

6. What is your highest level of education? (If you're currently attending college or school, please indicate your highest qualification to date).

Secondary school qualifications	<input type="checkbox"/>
College qualifications	<input type="checkbox"/>
Undergraduate Degree	<input type="checkbox"/>
Post graduate Degree/Qualifications	<input type="checkbox"/>
None of the above qualifications	<input type="checkbox"/>
Other	<input type="checkbox"/>

Please tick your response

If you have selected 'Other', please specify your highest level of education:

7. What is your current employment status?

Unemployed	<input type="checkbox"/>
Student	<input type="checkbox"/>
Self-employed	<input type="checkbox"/>
Employed (Full-time)	<input type="checkbox"/>
Employed (Part-time)	<input type="checkbox"/>
Apprentice	<input type="checkbox"/>
Voluntary Worker	<input type="checkbox"/>
Bank Worker	<input type="checkbox"/>
Other	<input type="checkbox"/>

Please tick your response

If you have selected 'Other', please specify your employment status:

About your 'voice hearing' experience

Please note, to enable us to find out more about your voice hearing experience, we may look at relevant sections of your medical notes.

1. What is the length of time that you have experienced hearing voices?

Less than 1 year	
1 - 2 years	
2 - 3 years	
3 - 4 years	
4 - 5 years	
5 - 6 years	
6 - 7 years	
7 - 8 years	
8 years or more	

2. Do you currently have a psychiatric diagnosis?

Yes	
No	

3. If so, what is your diagnosis?

Schizophrenia	
Schizoaffective disorder	
Delusional disorder	
Psychosis	
Other	
No diagnosis/ Not applicable	

If you have selected 'Other', please specify your diagnosis: _____

4. Do you agree with this diagnosis?

Yes	
No	
No diagnosis/ Not applicable	

If you would like to say more about this, please use this space to briefly explain your reasons for this: _____

5. How long have you had this diagnosis?

Less than 1 year	
1 - 2 years	
2 - 3 years	
3 - 4 years	
4 - 5 years	
5 - 6 years	
6 - 7 years	
7 - 8 years	
8 years or more	
Not applicable	

6. Do you currently take prescription medication to support your mental health?

Yes	
No	

7. If you currently take prescription medication, is your medication an antipsychotic?

Yes	
No	
Not applicable to me as I don't take prescription medication for my mental health	
Don't know	

Additional Comments

Please make any additional comments in the space below if you feel they are relevant to your background information.

Thank you for participating in this research study and taking the time to complete this questionnaire.