

**Does insecure attachment mediate the relationship between
trauma and voice-hearing in psychosis?**

A thesis submitted to The University of Manchester for the degree of
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Thesis abstract

The current thesis titled ‘does insecure attachment mediate the relationship between trauma and voice-hearing in psychosis?’ has been prepared by Marie Pilton in the year 2014. The thesis has been submitted to The University of Manchester for the degree of Doctor of Clinical Psychology in the Faculty of Medical and Human Sciences (section of Clinical and Health Psychology). The thesis has been prepared in paper based format and comprises three papers. The overall theme of the thesis is the investigation of potential underlying psychological factors within the experience of voice-hearing. The thesis particular focuses upon attachment and dissociation within the voice-hearing experience.

Firstly, a systematic literature review and meta-analysis regarding the relationship between dissociation and voices is presented. Paper 1 provides a comprehensive review of 32 studies investigating the association between dissociative experiences and voice-hearing. The review includes a quality assessment tool and meta-analysis with a view to evaluate and synthesise the research that has been carried out and published to date. The results are considered in relation to methodological limitations, clinical implications and recommendations for future research.

Secondly, research was carried out to explore insecure attachment as a potential mediating variable within the trauma and voice-hearing relationship. Paper 2 presents an investigation involving 55 voice-hearing participants with a diagnosis of psychosis. The participants completed a range of self-report measures. Mediation analysis indicated that insecure-anxious attachment might be indicated as a potential mediating factor within the trauma and voice-hearing relationship. The results are considered in relation to limitations of the study and possible clinical implications and recommendations for future research.

Thirdly, a critical evaluation and reflection of the two papers mentioned above was carried out. Strengths and weaknesses regarding the chosen methodology, directions for theory, clinical practice and future research were considered. Finally, the overall research process was reflected upon.

Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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**The relationship between dissociation and voices:
a systematic literature review and meta-analysis**

The following paper has been prepared for submission to 'Clinical Psychology Review.' The guidelines for authors are presented in appendix A.

Word count: 9,861 (excluding tables, figures and references).

Abstract

There appears to be an increasing number of studies exploring the association between voice-hearing and dissociative experiences within the literature. The current study provides a systematic literature review and meta-analytic synthesis of quantitative studies investigating the relationship between voice-hearing and dissociation. A systematic search identified and included 32 clinical and non-clinical studies, comprising 3797 participants, published between 1986 and 2014. Nineteen of these studies provided sufficient data to be included within the meta-analysis. The narrative review findings suggested that dissociative experiences may be implicated in voice-hearing and may potentially be a mediating factor within the well-established trauma and voice-hearing relationship. Similarly, the meta-analytic findings suggested that the majority of the identified studies showed a significant positive relationship between dissociative experiences and voice-hearing. The magnitude of the effect size for the overall sample was large and significant ($g=1.21$), indicating a robust relationship between these two phenomena. However, considerable heterogeneity within the results and methodological limitations were outlined. The review highlighted areas for future investigation. As the majority of identified studies were cross-sectional by design, it was recommended that future research include longitudinal designs with view to exploring the direction of the voice-hearing and dissociation relationship. Additionally, future studies may control for potential confounding factors and use random sampling in order to recruit representative samples. Clinical implications of the findings were also considered.

Key words: auditory hallucinations, voices, dissociation.

1. Introduction

Voices (auditory verbal hallucinations; AVH) have been described as auditory experiences that occur in the absence of external stimulation (Waters et al., 2012). They often, but not always, have speech-like qualities and can include other sounds. Voices are most commonly associated with a diagnosis of schizophrenia. However, there is no necessary association between voices and mental health difficulties (McCarthy-Jones & Davidson, 2013). The experience of hearing voices has been regarded as a relatively common experience in the general population, with a recent literature review reporting prevalence rates of between 0.6% and 84% (median=13.2%; Beavan, Read & Cartwright, 2011). Although a broad range of prevalence rates have been reported, one review stated that voices are almost routinely present within dissociative identity diagnoses (DID; Dell, 2006), with further studies reporting that 31% of individuals with a bipolar affective diagnosis (Hammersley et al., 2003), 46% of individuals with a borderline personality diagnosis, 66% of individuals with a schizophrenia diagnosis and 90% of individuals with both BPD and schizophrenia diagnoses (Kingdon et al., 2010) hear voices. As voices are frequently experienced as distressing within patient samples (e.g. Morrison, Nothard, Bowe & Wells, 2004), ongoing research is being carried out in an attempt to identify potential causes and mechanisms of voice-hearing.

The role of trauma in voice-hearing is well established. In the general population, significant associations have been found between voice-hearing and childhood bullying, physical and sexual abuse, with evidence of a dose-response relationship (Bentall, Wickham, Shelvin & Varese, 2012; Shelvin, Dorahy & Adamson, 2007). Research has also shown that the content of voices is thematically linked to experiences of trauma (e.g. Read & Argyle, 1999; Read, van Os, Morrison & Ross, 2005; McCarthy-Jones, 2011). One important mechanism that has been identified to explain the link between trauma and voice-hearing is dissociation (e.g. Anketell et al., 2010; Moskowitz, 2011; Moskowitz, Read, Farrelly & Williams, 2009; Varese, Barkus & Bentall, 2012).

Dissociation has been described as the failure to integrate information regarding psychological functioning, such as memory, consciousness and perception; it is often experienced as a sense of detachment from the self and/or environment (International Society

for Study of Dissociation, 2011). A number of terms regarding psychological symptoms, states and processes have been associated with ‘dissociation,’ such as divided attention, hypnotic suggestion, flashbacks and identity confusion (see Brown, 2006 for a full list). Furthermore, a range of self-report questionnaires have been developed to measure dissociation. The Dissociative Experiences Scale (DES; Bernstein & Putman, 1986) is the most commonly used instrument for the measurement of dissociation (Holmes et al., 2005) and has been used across mental health disorders (van IJzendoorn & Schuengel, 1996). The DES measures three distinct areas of dissociation: absorption, depersonalisation and amnesia. Absorption has been described as an experience of losing contact with one’s surroundings and becoming immersed in internal events such as thoughts and imagery (Waller, Putnam & Carlson, 1996). In general, absorption is viewed as a common process and a non-pathological form of dissociation (Waller & Ross, 1997). Hunter, Sierra and David (2004) described depersonalisation as experiencing a sense of unreality, detachment or disconnection, with symptoms including derealisation (i.e. the external environment appearing unfamiliar and unreal), dream-like-states, loss of empathy and a sense of disconnection from different parts of the body. Amnesia has been described as an inability to consciously retrieve autobiographical, personal information that should be successfully stored in memory and would ordinarily be readily accessible to recall. Dissociative amnesia is often related to trauma and is considered to be more than ordinary forgetfulness (Spiegel et al., 2011).

Dissociative experiences have been found to be a common feature within the general population (Ross, Joshi & Currie, 1990) and within mental health samples (e.g. Anketell et al., 2010; Haugen & Costillo, 1999; Koopman et al., 1999). These experiences have been associated with exposure to traumatic events (e.g. Bierre, 1988; van IJzendoorn & Schuengel, 1996) and have been conceptualised as a defensive or adaptive psychological coping strategy which reduces the emotional and physical pain of the traumatic experience (Bierre, 1996). It has been argued that trauma exposure in childhood is often experienced alongside overwhelming affect. Consequently, traumatic experiences are stored in the brain in a disconnected and dissociated manner, which leads to an unintegrated representation of the trauma and other experiences (Dorahy & Van der Hart, 2007; Van der Hart, Nijenhuis & Steele, 2006).

Allen, Coyne and Console (1997) propose that the experience of trauma-induced dissociation increases an individual's vulnerability to developing psychotic symptoms, such as voices. They argue that dissociative detachment deprives individuals of internal and external anchors, which increases and develops an individual's sense of feeling disconnected from the world, interpersonal relationships and within their intrapersonal self (i.e. individuals describe feeling a sense of disconnection from their body and actions). Consequently, Allen et al (1997) propose that the experience of dissociation leads to impaired reality-testing, severe confusion, disorganization, and disorientation, which appears to mirror psychotic experiences. Indeed, a dissociative sub-type of schizophrenia has been proposed (Ross, 2004). However, within psychosis samples, when compared to other symptoms of psychosis, voice-hearing in particular seems to be associated with dissociative experiences (e.g. Kilcommons & Morrison, 2005). Longden, Madill and Waterman (2012) also propose that exposure to trauma can lead to dissociative experiences, which in turn increases vulnerability to voice-hearing. They describe difficult and traumatic sensory and psychological experiences failing to integrate into the context of the self; it is this lack of integration which results in hearing voices. As such, voice-hearing can be understood as dissociated or disowned components of the self.

There appears to be an increasing number of studies exploring the association between voice-hearing and dissociative experiences across clinical and non-clinical samples, as well as different diagnostic groups. It is thought that this wide range of varied studies may allow the proposed dissociation-voice-hearing relationship to be generalised across populations. However, at present, these studies have not been synthesised and an assessment of the quality of evidence to support the proposed association has not been carried out. Therefore, the aims of the current study are to: 1) provide a comprehensive, yet systematic, review of the quantitative literature investigating the relationship between voice-hearing and dissociation; 2) evaluate the quality of evidence regarding the voice-hearing and dissociation relationship using specific quality assessment scales for systematic reviews of quantitative studies; and 3) synthesise and evaluate the magnitude of the relationship between voice-hearing and dissociation using meta-analytic methods. More specifically, to examine the overall relationship between voice-hearing and dissociation, the consistency of the relationship across clinical and non-clinical studies and across the "subtypes" of dissociative experiences which have been considered in the literature.

2. Method

2.1 Systematic literature review

2.1.1 Inclusion and exclusion criteria (systematic review)

A systematic literature search was carried out. As the DES is considered to be the most widely used measure of dissociation and was published in 1986, studies were reviewed from 1986 up to and including March, 2014. Studies which met the following criteria were included in the review: 1) use of a self-report measure of dissociation; 2) use of a self-report measure of voices and/or hallucination proneness; 3) used quantitative methodology; 4) published in a peer review journal; and 5) written in the English language. Studies were excluded if: 1) the study was presented in a conference extract, dissertation, or single case study format; 2) the study used staff-report measures opposed to individual self-report (e.g. Ross et al., 1990) due to the questionable accuracy and risk of symptom misinterpretation; and 3) the study compared patients with and without Schneiderian or positive symptoms in general, as the aim of the review was to examine pure measures of voices (e.g. item 3 on the Positive and Negative Syndrome Scale, PANSS; Kay, Fiszbein & Opler, 1987) No restrictions were placed on the age of participants or recruitment from clinical or non-clinical samples.

2.1.2 Search procedure

Electronic databases Embase, PsycINFO, Web of Science and Pubmed were systematically searched using two search sets (dissociation and voices) which were linked with the ‘AND’ instruction. The two search strings were as follows: dissociat* OR multiple personalit* OR depersonalisation OR depersonalization OR derealisation or derealization OR absorption AND Voice* OR hallucinat* OR psychotic OR psychosis OR schizophren* OR ‘severe mental’ OR ‘serious psychiatric’ OR ‘serious mental.’

The four databases yielded a total of 9,828 studies. Figure 1 details the systematic search carried out. The research team made decisions about whether articles met the inclusion criteria through regular meetings. At the ‘full paper search’ stage, all articles were reviewed

by MP, SB and KB and articles were only included if all authors were in agreement. Thirty two studies were identified as meeting criteria and were included in the review. Of these studies, the reference lists and citations were scanned in a bid to identify further literature not found in the database search. No further studies were identified.

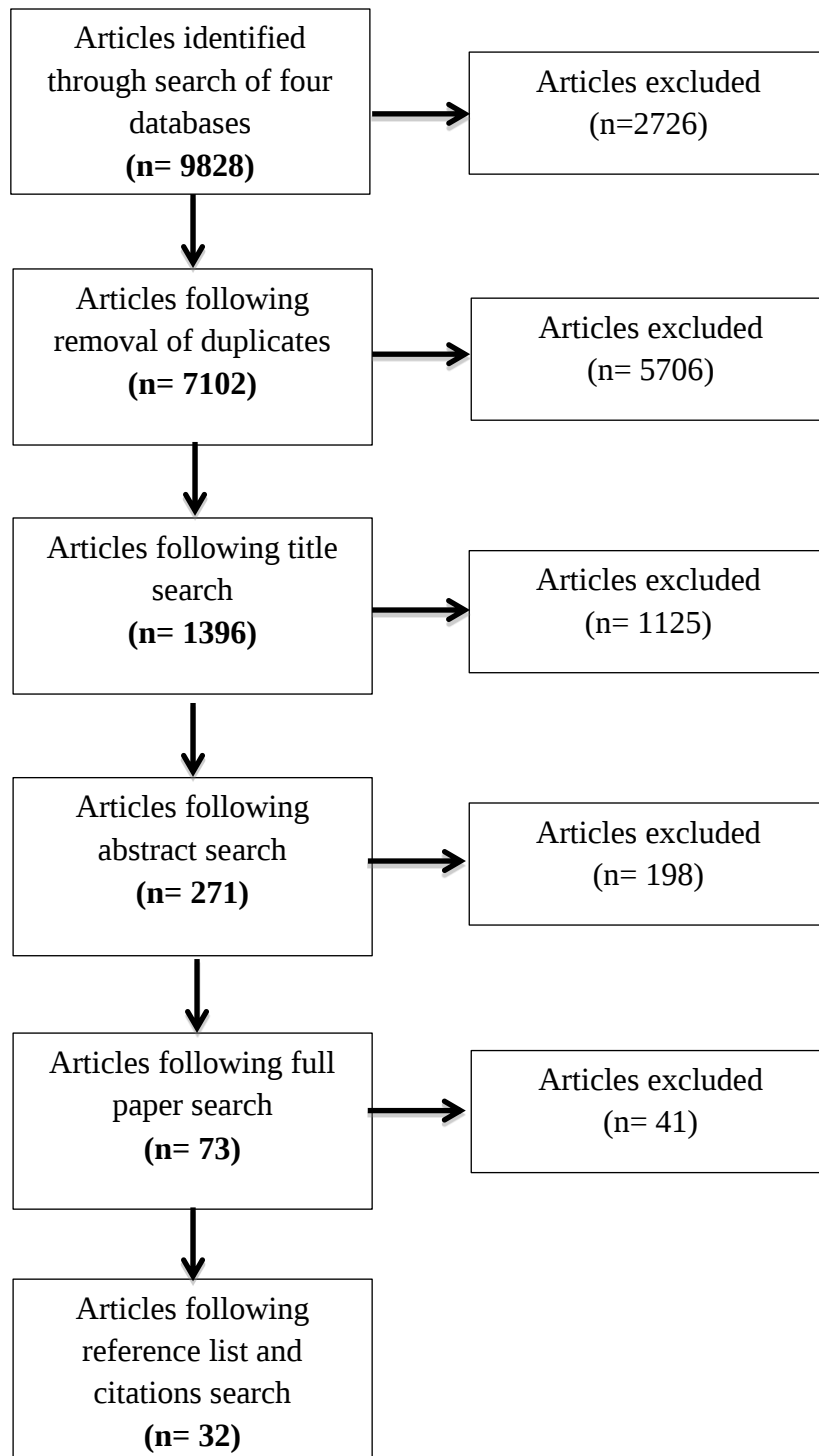


Figure 1: Flow diagram of systematic search

2.1.3 *Quality assessment*

Eligible studies were quality assessed. The Effective Public Health Practice Project tool (EPHPP; Thomas, 2003) was selected for use in the current review as it allowed evaluation of a variety of quantitative study designs and provided clear guidelines for assessment. Furthermore, it has been found to have good validity (Thomas, Ciliska, Dobbins, & Micucci, 2004) and inter-rater reliability (Armijo-Olivo, Stiles, Hagan, Biondo & Cummings, 2010). The EPHPP included the six following sections: 1) selection bias; 2) study design; 3) confounders; 4) blinding; 5) data collection method; and 6) withdrawals/ dropouts. Each section was rated as strong, moderate or weak using guidance from the EPHPP dictionary (instruction manual). The six individual section ratings were then reviewed to achieve an overall, global rating score as follows: strong (no weak ratings), moderate (one weak rating) or weak (two or more weak ratings). The studies were quality assessed by MP and monitored by SB and KB through regular meetings. Additionally, a proportion of these studies were rated and agreed upon by a reviewer independent to the study in order to ensure agreement. A shared understanding of the EPHPP dictionary was developed before independent rating commenced. High levels of agreement were found (90%) and these minor disagreements were discussed and resolved.

2.2. Meta-analysis

2.2.1 Procedure

The studies included in the systematic review were further examined for inclusion in the meta-analysis. The meta-analysis eligibility criteria (Section 2.2.2 below) are presented in addition to the systematic literature review criteria (Section 2.1.1).

2.2.2 Meta-analysis inclusion and exclusion criteria

Studies which met the following criteria were included in the meta-analysis: 1) the study statistically examined the relationship between dissociation and voices and/or hallucination-proneness; 2) the measures of dissociation, voices and/or hallucination-proneness were valid (i.e. the instrument had acceptable construct validity). On this basis, one study by Varese et al (2011a) was excluded as they used as a proxy measure of dissociation which was not specifically designed to measure this construct (i.e. Acting with awareness subscale from the Five Factors Mindfulness Questionnaire; Baer et al., 2008). Studies which met the following criteria were excluded from the meta-analysis: 1) studies which extended their data from previous published research (i.e. overlapping participant samples; see section 2.2.3 for specific analytic decisions used to address similar circumstances); 2) the study utilised retrospective measures of dissociation (e.g. peri-traumatic dissociation measure, in Brewin & Patel, 2010, study 1) and; 3) the study did not report sufficient information to calculate effect sizes and upon inviting authors to provide additional data, this information was not provided.

2.2.3 Effect size computation and integration method

Comprehensive Meta-Analysis, version 2 (CMA2) was used to calculate effect sizes and run the statistical analyses. Hedges' g (Hedges, 1981) was selected to be the main effect size metric for the analyses. Whenever possible, Hedges' g was computed from M , SD and sample sizes as reported in the primary studies. When these statistics were not reported, alternative computational methods to estimate effects of the d -family were used (see Borenstein, Hedges, Higgins & Rothstein, 2009) based on appropriate information extracted from the primary studies (e.g. t -values and associated p values; correlation coefficients and

total sample sizes). Hedges' correction was subsequently applied. When studies employed between group designs, effect-sizes were extracted when: 1) hallucinating participants (i.e. patients with AVHs; hallucination-prone non-clinical participants) were contrasted with comparable non-hallucinating participants (i.e. patients with comparable diagnosis but no AVHs; non-prone non-clinical participants) on measures of dissociation, or 2) dissociative patients (i.e. scoring within the pathological range from dissociation) were compared to non-dissociative patients on measures of AVHs. Furthermore, studies were considered eligible if they examined the relationship between dissociation and AVHs in a single group of participants using correlational or regression analyses.

A sizable number of studies included in the meta-analysis reported multiple effects based on the concomitant use of several measures assessing the constructs considered. Furthermore, several studies were based on an extension of previous participant samples. Meta-analysis assumes that the studies included are independent of one another (e.g. Borenstein et al., 2009). Hence, a coding hierarchy was developed following an initial review of the studies in order to avoid dependency, reduce bias in coding decision-making and maximise comparability amongst the studies included in the analyses. The coding hierarchy was as follows: 1) when measures of hallucination-proneness (e.g. Launay-Slade Hallucination Questionnaire, LSHS; Launay & Slade; 1981) and state measures of AVH (e.g. item 3 on the PANSS; Kay, et al., 1987) were assessed within one study, only the latter was included. It could be argued that the use of AVH measures are a more precise or valid measure of voices as hallucination-proneness is considered a multi-faceted construct which encompasses a range of experiences (e.g. intrusive thoughts, vivid mental events, hallucinated perception in different sensory modalities; Waters, Badcock & Mayberry, 2003). 2) When studies reported subscale and total scores of the AVH/hallucination-proneness measures only total scores were included. 3) When studies reported subscale and total scores of dissociation measures only total score effects were included in the main analysis. 4) When statistical information allowing for the computation of total score effect sizes were not reported a composite effect was estimated by merging the subscale effect. 5) When multiple groups of hallucinating participants were studied (e.g. current, remitted and never hallucinated) the currently hallucinating sample was compared with the never hallucinated sample as this was deemed a more suitable comparison group. 6) When multiple reports appeared to be drawn from overlapping participant samples (i.e. samples were extended or added to from previous

studies) the authors of these primary studies were contacted in order to request further information. When confirmation was received regarding overlapping samples, only the study with the largest participant sample was included in order to improve precision in the effect size extracted.

In keeping with the inclusion criteria, 19 studies were included in the meta-analysis. The studies were double coded by MP and FV. Disagreements were discussed and resolved among the whole research team. Random effects meta-analysis was used to integrate the extracted effects, as this model is considered appropriate for studies presenting considerable heterogeneity and allows inferences about generalizability beyond the studies included in the meta-analysis (Field and Gillett, 2010). The analysis was carried out in three stages: 1) overall analysis of the relationship between voices and total dissociation score (or a combined dissociation effect, where studies reported subscale scores) was calculated for the whole sample; 2) sub-group analyses were carried out to examine differences between clinical and non-clinical studies; and 3) sub-group analyses were carried out with different types of dissociation (i.e. absorption, depersonalisation and amnesia), since dissociation is a multi-faceted construct.

For all analyses, heterogeneity statistics (Q test and I^2) were used to examine the amount of statistical consistency in the effects across studies. Further analysis was then carried out to assess whether any of the studies had an undue influence on the meta-analytic results using ‘one study removed analysis.’ Additionally, in order to assess for publication bias, visual inspections of funnel plots were carried out, as well as the Egger’s test for funnel plot asymmetry (Egger, Davey-Smith, Schneider & Minder, 1997). Finally, to correct the results for the potential influence unpublished studies or other selection bias, the ‘trim-and-fill’ method was employed (Duval & Tweedie, 2000).

3. Results

3.1 Systematic review

3.1.1. Overall summary of studies

Thirty two studies were included in the systematic review. Table 1 provides a summary of each study, providing a brief overview of the following areas: design, sample type, overall sample size, group size, measures, summary of findings and global quality rating.

Table One: Summary of Studies included in Systematic Review

Author, date, country of recruitment	Design	Sample Type/ diagnosis	Total N	Group N's	Measures			Main (relevant) findings	Quality Rating
					Voices	Dissociation	Other		
Altman, Collins and Mundy (1997) <i>USA</i>	Between groups	Non-Clinical	38	1.VH=12, 2.nVH=26	1.DIS – psychotic symptoms list 2.DES-item 27	1.DES	1.PPVT-R 2.RISC 3.CDI	1. 32% of the sample reported experiencing AH's 2. Dissociation strongly correlated with AH's. 3. DES and AH's remain significantly associated after controlling for schizotypal thinking (RISC) and depression (CDI)	Mod
Anketell et al (2010) <i>Northern Ireland</i>	Between groups	Clinical; PTSD	40	1.VH=20, 2.nVH=20	1.PANSS	1.DES-II	1.PDS 2.WSBI	1. 50% of participants (with a diagnosis of PTSD) reported hearing voices. Those in the AH group experienced higher levels of torture/ life threatening illness. 2. The voice hearing group had significantly higher scores on the DES and DES-T than the non-voice hearing group.	Weak
Bradbury, Stirling, Cavil & Parker (2009) <i>UK</i>	Correlational	Non-Clinical	130	N/A	1.LSHS-R	1.DES-II	1.PDI 2.RTS 3.RGY 4.SPQ-B 5.SOC 6.RPBS 7.TRB	1. A significant correlation was found between LSHS-R and DES (at the <0.0005 level)	Weak
Brewin and Patel (2010) Study one <i>UK</i>	Between groups	Clinical; PTSD (war veterans)	158	1.Current PTSD=93 2.Past PTSD=21 3. No PTSD=44	1.DES-item 27	1.DES-T	1.PDEQ 2.SCID (PTSD)	1. 48.4% of the sample answered positively to hearing voices (DES-T; item 27). 2. A significant correlation was found between AH (DES-T; item 27) and dissociation. 3. A significant correlation was found between AH (DES-T; item 27) and the PDEQ.	Weak
Brewin and Patel (2010) Study two <i>UK</i>	Between groups	Clinical; PTSD, trauma, depressed	82	1.PTSD=30 2.Trauma = 13 3.Depressed= 39	1.DES-item 27 2.Semi-structured interview	1.DES-T	1.PSS 2.BDI	1. The PTSD group scored significantly higher on the AH item (DES –item 27) when compared with the other two groups, who did not differ from each other. 2. A significant correlation was found between AH (DES –item 27) and dissociation. 3. The semi-structured interview showed that the DES-item 27 was a valid measure of AH's.	Weak
Dorahy et al., (2009) <i>Northern Ireland and Australia</i>	Between groups	Clinical; Schizophrenia & DID	63	1.DID=29 2.Sw/oM=18 3.SwM=16	1.MUPS	1.DES-T 2.DID section of the DDIS	1.CTQ	1. The DID group were more likely to have heard voices before 18 years old, hear two or more voices, hear both adult and child voices and report other forms of AHs. 2. The three groups were similar in terms of; extent of command AHs, voice content contrasted mood and voices were more likely to be internal. 3. Logistic regression analysis found that five variables (hearing two or more voices, being told what to do by voices, feeling controlled by voices, voice content relating	Weak

								to someone influential in your life & voices replaying past memories) were significantly predicted by the DES-T.	
Ellason and Ross (1995)	Between groups	Clinical; DID and schizophrenia	348	1.DID=108 2.S=208	PANSS	DDIS		1. On the PANSS-AH score the DID group had a mean score of 4.67 (SD 1.14) 2. When comparing DID and Schizophrenia groups on the PANSS positive, negative and general subscales the Schizophrenia group scored in the higher range, although actual scores for AH were not reported. (<i>N.B; schizophrenia data gathered from previous study; Kay, Fiszbein & Opler, 1987a</i>)	Weak
Escher, Romme, Buiks, Delespaul and van Os (2002a)	Longitudinal	Clinical and non-clinical (VH's)	80	1. Help (from professionals). 2.No help (<i>n's not reported</i>)	MVI-C	DES	CGAS CBCL YSR BPRS	1. Higher scores on the DES were associated with an increased likelihood of voice persistence overtime. 2. Higher scores on the DES are associated with higher levels of proneness to psychosis.	
Escher, Romme, Buiks, Delespaul and van Os (2002b)	Longitudinal	Clinical and non-clinical (VH's)	80	1. Delusional ideation. 2. No delusional ideation (<i>n's not reported</i>)	MVI-C	DES	CGAS YSR BPRS	1. DES total score were higher in the delusional ideation group (mean=26.6; SD=21.1) than the non-delusional ideation group (mean=20.5; SD=13.5) at baseline. 2. Longitudinal analyses adjusting for covariates (delusional ideation) indicated that baseline dissociation was not associated with discontinuation of voices 3 years after baseline assessment (Hazard ratio =1.16 (95% CI=0.70-1.95) p=0.64)	
Glickson, Steinbach and Elimalach-Malmilyan (1999)	Between groups	Non-Clinical	29	1.High score of eidetic imagery=14 2.Control = 15	1.LSHS	1.DES 2.AS	1. Synaesthesia & Eidetic imagery tasks	1. Significant correlations were found between proneness to AH's and dissociation/absorption.	
Glickson and Barrett (2003)	Between groups	Non-Clinical	249	1.D =53 2.nD =196	1.BHS 2.LSHS	1.DES 2. DES-T 3.AS	1.PEPBQ 2.SEQ	1. 21% of the sample scored above the cut off for pathological dissociation (on the DES-T). 2. Significant correlations were found between AH's and dissociation symptoms. And proneness to AH's and dissociation symptoms.	Weak
Goff, Brotman, Kindlon, Waites and Amico (1991)	Between groups	Clinical; psychosis	61	SA=27 nSA=34	1.Inter-view	1.DES 2.SCID-D	1.LEQ 2.SCID 3.BRPS (retrospective)	1. Participants in the SA group reported significantly higher dissociation scores, AHs, report more amnesia, report earlier age of onset and more relapses than those in the nSA group. 2. There was a significant trend (p= <0.1) between those in the SA group and voices inside the head and history of substance misuse. 3. Multiple regression was performed. Abuse of stimulants predicted dissociation	

USA								score and accounted for 14% of the variance. Abuse of stimulants and sexual abuse predicted 25% of the variance in dissociation scores. When the effect of stimulant abuse was controlled for sexual abuse remained significant.		
Honig et al (1998)	Between groups	Clinical; Schizophrenia & DID & NP	48	1.S=18 2.DID=15 3.NP=15	1.AHI	1.DES	Trauma and coping strategies (AHI)	1. Significantly more participants in the non-patient group reported an earlier onset of voices (<12 years) in comparison to the Schizophrenia group. 2. 50% of participants across all three groups reported emotional neglect and abuse. No significant correlation was found between trauma and dissociation (DES). 3. Significantly more participants in the two patient groups reported hearing voices daily, continuously and voices commented on their and others thoughts in comparison to the non-patient group. 4. 100% of the Schizophrenia group and 93% of the DID group reported that their voices said negative things, in comparison to 53% in the non-patient group. Those in the two patient groups reported to feel more afraid, criticised and less in control compared to non-patient group.	Weak	
Netherlands		(All VHs)								
Kilcommons and Morrison (2005)	Correlational	Clinical; psychosis	32	N/A	1.PANSS	1.DES	1.THQ-R 2.PSDSS 3.PCI	1. 94% of the sample reported at least one traumatic event. PTSD was prevalent within 53% of the sample. 2. Those participants who reported sexual assault, scored significantly higher on the AH measure, than those who that did not. 3. All three DES subscales (amnesia, absorption and depersonalisation) were significantly correlated with AHs. 4. Multiple regression analysis showed that response to trauma (particularly depersonalisation) was a significant predictor of AHs.	Weak	
UK										
Kilcommons, Morrison, Knight and Lobban (2008)	Between groups	Non-Clinical	80	1.SA=40 2.nSA=40	1.RHS 2.PSYRA 3.AHI	1.DES	1.PDI-21 2.DTS 3.PTCI 4.SEQ2	1. 46.2% of sexually assaulted participants reported AH's (current and past). 2. The sexually assaulted group scored significantly higher on all measures of psychotic-like experiences and PTSD. 3. Positive associations were found between the DES total and predisposition to AH's. And DES total and AH's. 4. Multiple regression analyses showed that dissociation significantly predicted predisposition to Visual Hs (AH's not analysed) (N.B; n=26, completed full battery)	Weak	
UK										
Laddis and Dell (2012)	Between groups	Clinical; DID and psychosis	80	1.DID=40 2.S=20 (RR on MID) 3.S=20 (RCE on MID)	1.MID's voice scales	1.MID 2.SCID-D-R	1.TEQ 2.SCID-1	1. DID group scored significantly higher than schizophrenia group on measures of: dissociation, first rank symptoms, child voices, angry voices, persecutory voices, voices arguing and commenting. Schizophrenia group scored significantly higher than DID group on measures of delusions. 2. Scores on the TEQ were unrelated to the MID for the schizophrenia group in comparison to mixed sample of clinical and non-clinical participant (N.B; the mixed sample was from previous published studies (Dell, 2006; Somer & Dell, 2005)) 3. Multiple regression analysis showed that the significant predictor of dissociation in the Schizophrenia group was voices and in the DID group was ego-alien experiences	Weak	
USA										
Lysaker and LaRocco (2008)	Correlational	Clinical; psychosis	68	N/A	1.PANSS	1.TIS (dissociation subscale)	1.TAA-BRV 3.TSI	1. Approximately 2/3 sample reported a traumatic event. The most common forms of trauma reported were sexual assault (n=37) and physical abuse, with or without a weapon (n=31). 2. Significant correlations were found between AHs and dissociation.	Weak	

USA										
Maggini, Raballo and Salvatore (2002)	Between group	Clinical; psychosis	57	1.D=21 2.nD=36	1.SAPS	1. BSABS (Italian version)	1.SANS 2.CDS 3.TAS	1. Participants within the ‘depersonalised’ group scored significantly higher on the AHs subscale, in comparison to those within the non-depersonalised group. 2. Participants experiencing two or more depersonalisations, scored higher for cognitive disturbance, alexithymia and lower for stress threshold than those experiencing one form of depersonalisation. No differences were found for AH’s.	Weak	
Italy										
Morrison and Peterson (2003)	Between group	Non-Clinical	64	1.Trauma absent 2. Trauma present	1.RHS 2.IVI	1.DES-II	1.MCQ 2.PSS 3.PTCI 4.Trauma measure (authors design)	1. Positive correlations were found between AH’s and DES (total and subscale: amnesia, absorption and depersonalisation scores) and AH’s and intensity (multiple) of trauma. 2. In terms of specific types of trauma; bereavement, emotional abuse and physical assault were found to be associated with AH’s. 3. Multiple regression analysis suggested that dissociative processes were related to a predisposition to auditory and verbal AHs.	Weak	
UK										
Offen, Thomas and Waller (2003a)	Correlational	Clinical; psychosis (all VH)	36	N/A	1.BAVQ 2.Self-report	1.DES-II	1.PBI 2.BDI	1. High levels of depression and dissociation were reported. 2. Correlational analysis showed that paternal overprotection was significantly correlated with DES, BDI and voice malevolence (BAVQ). Lower levels of paternal care were significantly correlated with voice malevolence. 3. Dissociation mediated the relationship between paternal overprotection and depression. Dissociation did not mediate the relationship between paternal overprotection and voice malevolence.	Weak	
UK										
Offen, Waller and Thomas (2003b)	Between groups	Clinical; psychosis (all VH)	26	1.CSA=10 2.nCSA=16	1.BAVQ	1.DES-II 2.DES-T	1.BDI 2.SA subscale (from Burton, 1991)	1. 38.5 % reported CSA and scores on the DES-II, DES-T and voice malevolence were higher within this group, but not significantly different. 2. Significant negative correlations were found between age of first sexual abuse and dissociation (DES-II and DES-T), depression and voice malevolence.		
UK										
Perona-Garcelan et al (2008)	Between group	Clinical; psychosis	68	1.SwAH=17 2.SrAH=16 3.SnoAH=18 4.nCC=17	1.PANSS	1.DES-II	1.SCS-R	1. Patients with AH’s scored significantly higher on the PrSC (private self-consciousness subscale on the SCS-R) than the control group. No differences were found between any other groups. 2. Patients with AH’s scored significantly higher on the DES-II than patient’s never experiencing AH and the control group. Patients recovered from AH’s and patient’s never experiencing AH had significantly higher scores on the DES-II than the control group. 3. Correlations between PrSC and the DES-II (total and subscale: amnesia, absorption and depersonalisation scores) were significant (indicating self-focused attention is associated with an increase in dissociative experiences). 4. Multiple regression analysis found that depersonalisation (DEP) predicted AH’s.	Weak	
Spain										
Perona-Garcelan et al (2010)	Between group	Clinical; psychosis	37	1.DES>25=8 2.DES<24=29	1.PANSS	1.DES-II	1.TQ	1. Participants who experienced AH’s reported significantly higher frequency of childhood trauma compared to those without AH’s. No difference was found for adulthood trauma. 2. A significant correlation was found between DES-II scores and childhood trauma,	Weak	

Spain									but not adulthood trauma.	
Perona-Garcelan et al (2012a)	Correlation	Clinical; psychosis	71	N/A	1.PANSS	1.DES-II	1.TQ	3. Participants scoring 25 and above on the DES-II (indicating pathological dissociation) scored higher on the PANSS-AH and reported higher frequency of childhood trauma.		
Spain		N.B; extension of sample from papers published in 2008 & 2010						1. Positive correlations were found between childhood trauma and DES-II (total and subscale: amnesia, absorption and depersonalisation scores).	Weak	
								2. Positive correlations were found between childhood trauma and AH's (and delusions).		
								3. Positive correlations were found between AH's and dissociation.		
								4. Multiple mediation analysis showed that the depersonalisation variable mediated the relationship between childhood trauma and AHs.		
Perona-Garcelan et al (2012b)	Between group	Clinical; psychosis	124	1.SwAH & Del=27 2.SnAH& del=20 3.Sr =28 4.CC =22 5.nCC =27	1.PANSS	1.TAS 2.CDS	1.MCQ-30	1. Patients with AHs scored significantly higher on the TAS (absorption) when compared with all other groups, with the exception of the clinical control group.		
Spain								2. Patients with AHs scored significantly higher on the CDS (depersonalisation) when compared with all other groups.		
								3. Multiple regression analysis found that the best predictors of PANSS scores were CDS and MCQ-30 subscale (need to control thoughts).		
Perona-Garcelan et al (2013)	Between group	Non-Clinical	318	1.HP-AH=55 2.MP-AH=235 3.LP-AH=28	1.LSHS-R	1.TAS 2.CDS 3.SAS	1.MCQ-30	1. Participants highly prone to AHs had significantly higher absorption, depersonalisation and self-focused attention scores than those scoring in the medium and low range.	Mod	
Spain								2. Significant correlations were found between predisposition to AHs dissociation and self-focused attention (which remained significant when controlling for meta-cognitive beliefs).		
								3. Regression analysis showed that absorption and depersonalisation significantly predicted AH proneness.		
Perona-Garcelan et al (2014)	Between group	Non-Clinical	318	1.HP-AH=55 2.MP-AH=235 3.LP-AH=28	1.LSHS-R	1.TAS 2.CDS	1.SMQ 2.TQ	1. 45% of participants reported to experience childhood trauma (<15years old). Chi-squared test showed that the highly prone group had experienced significantly more childhood traumas (frequency) than the low prone group. No differences were found in T test analysis.	Weak	
Spain								2. Significant correlations were found between absorption, depersonalisation and childhood trauma.		
								3. Significant correlations were found between AH-proneness and absorption and depersonalisation.		
								4. High levels of mindfulness were significantly correlated with low levels of depersonalisation and absorption.		
								5. Multiple mediation analysis showed that depersonalisation and absorption mediated the relationship between childhood trauma and AH-proneness.		

Spitzer, Haug and Freyberger (1997) <i>Germany</i>	Between group	Clinical; psychosis	54	1.S= 27 2.nCC= 27	1.PANSS	1.FDS (German version DES)	1.SCL-90R 2.MWT	1. Mean scores of FDS total score were significantly higher within the schizophrenia group than the control group. 2. Correlations were found between PANSS-AH and FDS (total and subscale: amnesia, absorption and depersonalisation scores).	Weak
Varese et al., (2011a) <i>UK</i>	Between group	Non-Clinical	388	1.HP-AH infrequent IT=11 2.HP-AH frequent IT =23 3.LP-AH frequent IT =13 4.LP-AH infrequent IT =20	1.LSHS-R	1.FFMQ-A	1.DTQ-F 2.PADS 3.MCQ-30 4.FFMQ 5.SDT	1. Correlations showed that AH-proneness was significantly associated with the FFMQ-A variable. 2. Regression analysis showed that FFMQ-A, FFMQ-O (observing) and PADS significantly predicted AH proneness. Acting with awareness was the best predictor of LSHS-R scores. 3. Direct discriminant analysis was conducted. The dimensions which differed between the AH and non-AH prone groups were the FFMQ-A and FFMQ-O variables.	Mod
Varese et al (2011b) <i>UK</i>	Between group	Clinical; psychosis	65	1.SwAH= 21 2.SnAH= 21 3.nCC=23	1.PANSS	2.ESM – dissociation	1.AQT. 2.ESM; AH's, paranoia, stress & Experiential avoidance	1. Patients with AH's group reported significantly higher levels of dissociation than non-AH patients and control group. 2. Multilevel linear regression showed that AH's were significantly predicted by dissociation and experiential avoidance. Only the effect of dissociation remained significant after controlling for paranoia. 3. Multilevel linear regression showed that dissociation predicted AH's, especially under high levels of stress. Patient's with AH's reported a greater increase in dissociation in response to minor daily life stressors compared to those without AH's and controls.	Weak
Varese et al (2012) <i>UK</i>	Between group	Clinical; psychosis	65	1.SwAH =15 2.SrAH =14 3.nAH=16 4.nCC=20	1.PANSS, 2.LSHS-R, 3.ASDT	1.DES	1.AQT 2.CATS	1. Participants with AH's scored significantly higher scores on the DES and CATS compared to clinical and healthy controls. 2. Significant correlations were found between AH-proneness and DES and AH-proneness and CATS. 3. Signal detection abnormalities were not associated with pathological dissociation. 4. Mediation analysis showed that the relationship between AH-proneness and CATS was mediated by the DES in both groups (patient and aggregate). Furthermore, the DES significantly mediated the relationship between AH-proneness and SA, in both groups. In the aggregated sample only, the DES was found to mediate the relationship between neglect/ negative home environment and AH-proneness.	Weak
Yoshizumi, Murase, Honjo, Kaneko and Murakami (2004)	Between group	Non-Clinical	380	1.wAH =35 2.VisH =21 3.wAH& wVisH=	1.Inter-view	1.A-DES (Japanese version)	1.CDI-J 2.STATIC	1. 21.3% of participants reported to have experienced some kind of hallucination. AHs alone was the most common form reported (n=35; 9.2%), 5.5% reported Visual H alone (n=21) and 6.6% reported to experience combined AH and Visual H (n=25). 2. Results showed that the combined group and the Visual Hs-only group scored significantly higher on the A-DES when compared with the control group. 3. The combined group scored significantly higher on the A-DES when compared with	Weak

<i>Japan</i>	25 4.Control = 299	the AH-only group. 4. Groups were formed to analyse content of voices (1. Content closely related to voice, 2. Content somewhat related to voice, 3. Content unrelated to voice, 4. Control group) and A-DES scores. No significant statistical differences were found, although differences were observed in raw mean/ SD scores.
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Abbreviations: VH=voice-hearing; nVH=non voice-hearing; wAH=auditory hallucinations; H=hallucinations; S=schizophrenia patient; SwAH=schizophrenia patient with auditory hallucinations; SrAH=schizophrenia patients recovered/ remitted from auditory hallucinations; Sr=schizophrenia patient recovered; P=patient; nP=non-patient; SnoAH=schizophrenia patient, never experienced auditory hallucinations; SwM=schizophrenia patient with maltreatment; Sw/oM=schizophrenia patient without maltreatment; nCC= non-clinical controls; CC=clinical controls; HP=high hallucination-proneness; MP=medium hallucination-proneness; LP=low hallucination proneness; del=delusion; D=dissociation; nD=non-dissociation; DID=dissociative identity disorder; CSA=childhood sexual abuse; SA=sexual abuse/ assault; nSA=non-sexual abuse/ assault; IT=intrusive thoughts; N/A=not applicable; Mod= moderate; RR=rated retrospectively; RCE=rated current experience.

Voice and hallucination-proneness measures: Positive and Negative Syndrome Scale (PANSS; Kay, et al., 1987), Revised Launay-Slade Hallucination Scale (LSHS-R, Bentall & Slade, 1985b), Auditory Hallucination Interview (AHI; Romme & Escher, unpublished), Revised Hallucination Scale (RHS; Morrison, Wells & Northard, 2000), Maastricht Voices Interview for Children (MVI-C; Romme, 1996; Romme & Escher, 1996), Diagnostic Inventory Schedule–Psychotic Symptom List (DIS; Robins, Helzer, Retcliff & Seyfried, 1982), Mental Health Research Institute Unusual Perceptions Schedule (MUPS; Carter, Mackinnon, Howard, Zeegers & Copolov, 1995), Barrett Hallucination Questionnaire (BHS; Barrett & Etheridge, 1992), Launay-Slade Hallucination Questionnaire (LSHS; Launay & Slade, 1981), Psychotic Symptoms Rating Scale (PSYRATS; Haddock, McCarron, Tarrier & Faragher, 1999), Multidimensional Inventory of Dissociation-voices subscale (MID; Dell, 2006), Scale for the Assessment of Positive Symptoms (SAPS; Andreasen & Arndt, 1995), Beliefs About Voices Questionnaire (BAVQ; Chadwick & Birchwood, 1995) and Interpretation of Voices Inventory (IVI; Morrison et al., 2002).

Dissociation measures: DES, Dissociative Experiences Scale –II (DES-II; Carlson & Putman, 1993), Dissociative Experiences Questionnaire-Taxon (DES-T; Waller et al., 1996), Adolescent Dissociative Experiences Scale (A-DES; Japanese version; Tanabe, 2002), Dissociative Identity Disorder section of the Dissociative Disorders Interview Schedule DDIS; Ross et al., 1989a), Multidimensional Inventory of Dissociation (MID; Dell, 2006a), Structured Clinical Interview for DSM-IV-R-Dissociative Disorders SCID-D-R (SCID-D-R; Steinburg, 1994b), Structured Clinical Interview for DSM-III-R-Dissociative Disorders (SCID-D; Steinberg, Rounsaville, Cicchetti, & Domenic, 1990), Trauma Symptoms Inventory -dissociation subscale (TIS; Bierre, 1985), Fragebogen zu Dissoziativen Symptomen (FDS; ie. German Version of DES; Freyberger et al., 1998), Five Factors Mindfulness Questionnaire –Acting with Awareness Subscale (FFMQ-A; Baer et al., 2006). Cambridge Depersonalisation Scale (CDS; Sierra & Berrios, 2000) and Bonn Scale for the Assessment of Basic Symptoms –items B3.4, C2.11 and D1.1 (BSABS; Italian version; Huber & Gross, 1995), Tellegen Absorption Scale (TAS; Tellegen & Atkinson, 1974), Absorption Scale (AS; Glickson, 1991) and Self Absorption Scale (SAS; McKenzie & Hoyle, 2008).

Other measures:

Peabody Picture Vocabulary Test-Revised (PPVT-R; Dunn & Dunn, 1981), Rust Inventory of Schizotypal Thinking (RISC; Rust, 1987), Children’s Depression Inventory (CDI; Weiss et al., 1991), Children’s Depression Inventory- Japanese Version (CDI-J; Murata Tsutsumi, Sarada, Nakaniwa & Kobayashi, 1989), Peri-traumatic Dissociative Experiences Questionnaire-Rater Version (PDEQ; Marmar, Weiss & Meltzer, 1997), Structured Clinical Interview for DSM-IV (SCID-IV; Spitzer, Gibbon & Williams, 1996), Posttraumatic Stress Scale (PSS; Foa et al., 1993), Beck Depression Inventory (BDI; Beck, Rush, Shaw & Emery, 1979; Beck, Ward, Mendlesohn, Mock & Erbaugh, 1961), Peters Delusions Inventory (PDI; Peters, Joseph, & Garety, 2004), “Age-Universal” I-E Scale-Religiosity (RGY; Gorsuch & McPherson, 1989), Revised Transliminality Scale (RTS; Lange, Thalbourne, Houran, & Storm, 2000), Schizotypal Personality Questionnaire-Brief (SPQ-B; Raine & Benishay, 1995), Sense of Coherence (SOC; Antonovsky, 1993), Revised Paranormal Beliefs Scale (RPBS; Tobacyk, 2004), Traditional Religious Beliefs (TRB subscale of the RPBS; Tobacyk, 2004),

Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998), Brief Psychiatric Rating Scale (BPRS; Overall & Gorham 1962; Lukoff, Nuechterlein & Ventura, 1986), Youth Self-report/11-18 (TSR; Verhulst et al., 1996), Children's Global Assessment Scale (CGAS; Shaffer et al 1983), Child Behaviour Checklist (CBCL; Verhulst et al 1996), Paranormal Experience and Paranormal Belief Questionnaire (PEPBQ; Glickson, 1990), Subjective Experience Questionnaire (SEQ; Glickson, 1989), Life Experiences Questionnaire (LEQ; Bryer, Nelson, Miller & Krol, 1987), Structured Clinical Interview for DSM-III-R (SCID; Spitzer et al., 1987), Structured Clinical Interview for DSM-III-R –Dissociative Disorders (SCID-D; Steinberg et al., 1990), Peters et al. Delusion Inventory (PDI; Peters, Joseph & Garety, 1999), Davidson Trauma Scale (DTS; Davidson, 1996), Trauma Questionnaire (TQ; Davidson et al., 1990), Post Traumatic Cognitions Inventory (PTCI; Foa, Elhers, Clark, Tolin & Orsillo, 1999), Sexual Events Questionnaire-2 (SEQ2; Calam & Slade, 1989), Trauma History Questionnaire (THQ; Green, 1996), Post-traumatic Stress Disorder Symptom Scale (PSDSS; Foa et al., 1986), Posttraumatic Stress Diagnostic Scale (PDS; Foa, Riggs, Dancu & Rothbaum, 1993), White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994), Traumatic Experiences Checklist (TEQ; Nijenhuis, Van der Hart & Kruger, 2002), Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I First, Spitzer, Gibbon & Williams, 1996), Trauma Assessment for Adults –Brief Revised Version (TAA-BRV, Cusak, Frueh & Brady, 2004), Trauma Symptom Inventory (TSI; Briere, 1985), Scale for the Assessment of Negative Symptoms (SANS; Andreasen & Arndt, 1995), Calgary Depression Scale (CDS; Addington, Addington, Maticka-Tyndale & Joyce, 1992), Toronto, Alexithymia Scale (TAS, Bagby Taylor & Parker, 1994), Metacognitions Questionnaire (MCQ; Cartwright-Hatton & Wells, 1997), Metacognitions Questionnaire (MCQ-30; Wells & Cartwright-Hatton, 2004), Parental Bonding Instrument (PBI; Parker, Tupling & Brown, 1979), Self-consciousness Scale (SCS-R; Scheier & Carver, 1985), Southampton Mindfulness Questionnaire (SMQ; Chadwick et al., 2008), Revised Symptom Checklist 90 (SCL-90R; Detogatis, 1986), Multiple Choice Intelligence Test (MWT; Lehl, 1977), Child Abuse and Trauma Scale (CATS; Sanders & Becker-Laursen, 1995), The Quick Test (AQT; Ammons & Ammons, 1962), The Persecution and Deservedness Scale (PADS; Melo, Corcoran, Shryane, & Bentall, 2009), The Frequency subscale of the Distressing Thoughts Questionnaire (DTQ-F; Clark & de Silva, 1985) and the Signal Detection Task (SDT; Barkus, Stirling, Hopkins, McKie & Lewis, 2007).

3.1.2 Demographic characteristics

A total of 3797 participants took part in the studies included in the review. The female to male ratio was 1693:1531. However, three studies did not record this information (Brewin & Patel, 2010; study 2; Ellason & Ross, 1995; Glickson & Barrett, 2003) and therefore information was not available for 573 participants. The mean age was 35.4 years, with information regarding age not available for two studies (Glickson, et al., 1999; Yoshizumi et al., 2004). The range of ages sampled were between 8 and 82 years old, although several studies did not report this data (Brewin & Patel, 2010; study 1 & 2; Glickson, et al., 1999; Goff et al., 1991; Honig et al., 1998; Laddis & Dell, 2012; Lysaker & LaRocco, 2008; Maggini et al., 2002; Perona-Garcelán et al., 2013; Perona-Garcelán et al., 2014; Varese et al., 2011b; Varese et al., 2011a; Varese et al., 2012). Twelve of the 32 studies were considered non-clinical as the participants were recruited from non-clinical populations (n=2137). The remaining 20 studies recruited from clinical populations, the participants had diagnoses of psychosis (n=957), DID (n=192) and PTSD (n=184). Non-clinical control participant's (n=287) were also recruited within clinical studies for comparison purposes. Studies recruited across a range of mental health services (n=1256), non-mental health services (n=1037), mixed mental health and non-mental health services (n=160), universities (n=1211), authors' colleagues and friends (n=32) and elsewhere, such as a medical assessment centre and media channels (n=101). Studies were conducted within the UK (n=11), Spain (n=6), USA (n=4), Israel (n=2), Northern Ireland (n=1), Netherlands (n=3), Italy (n=1), Germany (n=1), Japan (n=1), with one study recruiting across two countries (Northern Ireland and Australia; Dorahy et al., 2009). The majority of the studies employed between-group designs (n=24). However, six studies used correlational and two studies used longitudinal designs.

3.1.3 Measures

Sixteen measures were used to investigate voices. The most commonly administered measures were the: Positive and Negative Syndrome Scale (PANSS; Kay, et al., 1987; n=10), the revised Launay-Slade Hallucination Scale (LSHS-R, Bentall & Slade, 1985b; n=6), the authors' own interview schedule (n=4) and the DES-item 27 (AH item; n=3). Additionally, 11 measures were used in order to investigate dissociation. The most commonly administered were the: DES (n=7), the DES-II (Carlson & Putman, 1993; n=8) and the DES-Taxon (DES-T; Waller et al., 1996; n=4). As the DES-II was often referred to as merely the DES, these

numbers have been based upon references provided. Two questionnaires were used in order to measure depersonalisation: Cambridge Depersonalisation Scale (CDS; Sierra & Berrios, 2000; n=3) and Bonn Scale for the Assessment of Basic Symptoms –items B3.4, C2.11 and D1.1 (BSABS; Italian version; Maggini et al., 1992; n=1). Three questionnaires were used in order to measure absorption: Tellegen Absorption Scale (TAS; Tellegen & Atkinson, 1974; n=3), Absorption Scale (AS; Glickson, 1991; n=1) and Self Absorption Scale (SAS; McKenzie & Hoyle, 2008; n=1). Table 1 presents all the measures used within the identified studies.

3.1.4 Study quality assessment

Table 2 presents the results of the quality assessment, using the EPHPP. In line with guidance from the EPHPP dictionary, each study is rated upon six individual domains, achieving either a strong, moderate or weak rating, with individual scores finally collated to achieve an overall global score.

Table 2: EPHPP Quality Ratings for the Six Components and Overall, Global Rating of Identified Studies.

Study Name	a. Selection Bias	b. Study Design	c. Confounders	d. Blinding	e. Data collection methods	f. Withdrawals and drop outs	OVERALL GLOBAL RATING
Altman et al (1997)	WEAK	MODERATE	MODERATE	MODERATE	STRONG	MODERATE	MODERATE
Anketell et al (2010)	WEAK	MODERATE	WEAK	MODERATE	STRONG	MODERATE	WEAK
Bradbury et al (2009)	MODERATE	WEAK	WEAK	STRONG	STRONG	MODERATE	WEAK
Brewin and Patel (2010)	WEAK	MODERATE	WEAK	MODERATE	STRONG	MODERATE	WEAK
Study one							
Study two	WEAK	MODERATE	WEAK	MODERATE	WEAK	MODERATE	WEAK
Dorahy et al (2009)	WEAK	MODERATE	WEAK	MODERATE	STRONG	MODERATE	WEAK
Ellason and Ross (1995)	WEAK	MODERATE	WEAK	MODERATE	STRONG	MODERATE	WEAK
Escher et al (2002a)	WEAK	MODERATE	WEAK	MODERATE	STRONG	WEAK	WEAK
Escher et al (2002b)	WEAK	MODERATE	WEAK	MODERATE	STRONG	WEAK	WEAK
Goff et al (1991)	MODERATE	MODERATE	WEAK	MODERATE	WEAK	MODERATE	WEAK
Glickson, et al (1999)	WEAK	MODERATE	MODERATE	MODERATE	WEAK	MODERATE	WEAK
Glickson and Barrett (2003)	WEAK	MODERATE	WEAK	MODERATE	WEAK	MODERATE	WEAK
Honig et al (1998)	WEAK	MODERATE	WEAK	MODERATE	WEAK	MODERATE	WEAK

Kilcomm- ons and Morrison (2005)	WEAK	WEAK	MODERATE	MODERATE	WEAK	MODERATE	WEAK
Kilcomm- ons et al (2008)	WEAK	MODERATE	WEAK	MODERATE	STRONG	MODERATE	WEAK
Laddis and Dell (2012)	WEAK	MODERATE	WEAK	MODERATE	STRONG	MODERATE	WEAK
Lysaker and LaRocco (2008)	WEAK	WEAK	WEAK	MODERATE	STRONG	MODERATE	WEAK
Maggini et al (2002)	WEAK	MODERATE	MODERATE	MODERATE	WEAK	MODERATE	WEAK
Morrison and Peterson (2003)	WEAK	MODERATE	WEAK	STRONG	WEAK	MODERATE	WEAK
Offen et al (2003a)	WEAK	WEAK	WEAK	MODERATE	STRONG	MODERATE	WEAK
Offen et al (2003b)	WEAK	MODERATE	WEAK	MODERATE	STRONG	MODERATE	WEAK
Perona- Garcelan et al (2008)	WEAK	MODERATE	WEAK	MODERATE	STRONG	MODERATE	WEAK
Perona- Garcelan et al (2010)	WEAK	MODERATE	WEAK	MODERATE	STRONG	MODERATE	WEAK
Perona- Garcelan et al (2012a)	WEAK	WEAK	WEAK	MODERATE	STRONG	MODERATE	WEAK
Perona- Garcelan et al (2012b)	WEAK	MODERATE	WEAK	MODERATE	STRONG	MODERATE	WEAK

Perona-Garcelan et al (2013)	WEAK	MODERATE	MODERATE	STRONG	STRONG	MODERATE	MODERATE
Perona-Garcelan et al (2014)	WEAK	MODERATE	WEAK	STRONG	STRONG	MODERATE	WEAK
Spitzer et al (1997)	WEAK	MODERATE	WEAK	STRONG	WEAK	MODERATE	WEAK
Varese et al (2011a)	WEAK	MODERATE	MODERATE	MODERATE	STRONG	MODERATE	MODERATE
Varese et al (2011b)	WEAK	MODERATE	WEAK	MODERATE	MODERATE	MODERATE	WEAK
Varese et al (2012)	WEAK	MODERATE	WEAK	MODERATE	STRONG	MODERATE	WEAK
Yoshizumi et al (2004)	MODERATE	MODERATE	WEAK	STRONG	WEAK	MODERATE	WEAK

With regards to selection bias, the majority of the studies were rated within the weak range (n=29), with three studies rated within the moderate range and no studies in the strong range. There are two parts to the selection bias domain; firstly, whether the participants are likely to represent the target population. The EPHPP guidelines state that studies employing a non-systematic referral from a source or a self-referral should be rated within the weak range. Therefore, where studies reported that participants had been identified or approached by mental health services or key workers, it was assumed this was not systematic. Secondly, the EPHPP also evaluates the percentage of individuals agreeing to participate. Only a limited number of studies (Altman, Collins & Mundy, 1997, Offen et al., 2003a; Offen et al., 2003b) reported this information.

The studies identified in the literature search used either longitudinal, case-control (between-group) or correlational designs. In line with the study design domain within the EPHPP tool, a moderate rating was given to those studies utilising longitudinal (n=2) and case-control designs (n=24) and a weak rating to those using a correlational design (n=6). In terms of potential confounding variables, the majority of the studies were considered weak (n=27) by the EPHPP tool, in that they took into account less than 60% of potential confounders in the study design or analysis. By design, studies analysing data using regression analysis took into account confounding variables. The EPHPP tool outlines potential demographic confounders such as age, gender and education. The authors also included confounding variables specific to the research area such as paranoia, delusions, meta-cognitive beliefs, trauma exposure and post-traumatic stress disorder (PTSD) symptoms. It was agreed that studies taking into account five confounders, including at least one demographic variable outlined by the EPHPP, would be scored in the moderate range (i.e. 61-79%). Studies taking into account eight confounders, including at least two demographic variables would be scored in the strong range (i.e. 80-100%). Consequently, a limited number of studies were rated as moderate (n=5) as they took into account between 60-79% potential confounders, whilst no studies were rated as strong on this domain.

With regards to blinding, studies were rated as strong if both the outcome assessor and participants were blind to the research question. Six studies fell into the strong range. These were studies that asked all participants to complete measures independently and return them

to the researchers for analysis. In these cases, it was assumed that participants were blind to the research question and, as they were completing the measures alone, the influence of the outcome assessor was not relevant. The majority of the studies (n=26) did not describe blinding procedures and therefore were rated in the moderate range, which is in line with EPHPP guidance.

The majority of the measures used to assess voices and dissociation were considered valid and reliable and therefore gained a strong quality rating (n=21); however, one study gained a moderate rating and ten studies were given weak ratings. Where measures of internal consistency, test-retest reliability and validity were not reported in the paper, it was assumed that for published measures the scores were acceptable and rated as strong. Where measures were written in the English Language and translated into participants' native language (e.g. Hebrew, Spanish or German), the measure was considered valid and reliable if the appropriate validation process had been carried out, or the measure had been translated using a thorough process of translation followed by back translation. Three studies scored within the weak range for not utilising the appropriate validation processes (Spitzer et al., 1997; Glickson et al., 1999; Glickson and Barrett, 2003).

In terms of withdrawals and drop outs the EPHPP tool outlines that if the percentage of participants completing the study is less than 60% the study should score within the weak range. As only two studies employing longitudinal designs were identified in the review and both studies reported that the percentage of participants completing the study was less than 60%, they scored within the weak range (Escher et al., 2002a; 2002b). The remaining studies employed cross-sectional designs (n=30). The EPHPP tool outlines that this domain is not applicable to 'one time studies,' and as such advises ratings within the 'moderate' range.

Finally, the six individual section ratings were then reviewed to achieve an overall, global rating score as follows: strong (no individual weak ratings), moderate (one individual weak rating) or weak (two or more individual weak ratings). The majority of studies achieved a weak rating (n=27), a small proportion achieved a moderate range (n=3), and none of the studies achieved a strong rating (n=0).

3.1.5 Non-clinical studies

Twelve studies were identified in which the participants were reported to have no clinical diagnoses and were consequently considered ‘non-clinical’ (Altman, Collins & Mundy, 1997; Bradbury et al., 2009; Escher et al., 2002a; Escher et al., 2002b; Glickson et al., 1999; Glickson & Barrett, 2003; Kilcommons et al., 2008; Morrison & Peterson, 2003; Perona-Garcelán et al., 2013; Perona-Garcelán et al., 2014; Varese et al., 2011a; Yoshizumi et al., 2004). Escher et al’s (2012a; 2012b) samples were self-identified voice-hearers. However, diagnostic interviews were not carried out; instead, the authors measured problem behaviour and social functioning. Three studies reported the prevalence of voice-hearing in their non-clinical sample, ranging from 9.2% in a sample of 11-12 year olds (Yoshizumi et al., 2004) to 46.2% in an sample with experience of sexual assault (Kilcommons et al., 2008). One study described the prevalence of dissociative pathology in their non-clinical student sample, reporting that 21% of participants scored within the DES-T pathological range (Glickson & Barrett, 2003).

Each of the twelve studies examined the link between voices and dissociation and significant results were found within all studies. Escher et al’s (2012a; 2012b) papers are the only two longitudinal studies included within the current review and the authors are likely to have reported data upon the same 80 child participants (range: 8-19 years). The findings of Escher (2012a) showed that higher scores on the DES were associated with an increased likelihood of voice persistence over time. Overall, the number of non-clinical studies which controlled for a range of potentially confounding variables was limited. For example, some studies controlled for variables such as schizotypal thinking and depression (Altman, Collins & Mundy, 1997), age, gender and modality of hallucinations (Yoshizumi et al., 2004), sex, age, education, field of study and motivation to participate in the study (Glickson et al., 1999), meta-cognitive beliefs (Morrison & Petersen, 2003; Perona-Garcelan et al., 2013) and paranoia (Varese et al., 2011a). When studies did control for potential confounds the relationship between voices and/or hallucination-proneness and dissociation remained significant. In comparison to studies recruiting from clinical samples, the majority of studies recruiting from non-clinical samples included large sample sizes. The largest sample size included 388 participants (Varese et al., 2011a). Moreover, approximately one third of non-clinical studies used a data collection method which ensured the participants were blind and

therefore not influenced by researcher bias. However, an obvious limitation to non-clinical studies is that the majority measured hallucination-proneness, in comparison to a state measure of voice-hearing. As such, the findings may not necessarily be generalizable to clinical populations of voice-hearers.

3.1.6 Clinical studies

3.1.6a Clinical studies – PTSD

Three studies were identified that included a PTSD sample (Anketell et al., 2010; Brewin & Patel, study 1 & 2, 2010) and all three studies reported a significant relationship between voice-hearing and dissociation. However, there are some limitations within these clinical PTSD studies. For example, two of the three samples were likely to be unrepresentative of a typical PTSD sample as they recruited ex-servicemen (Brewin & Patel, 2010; study 1) and recruited from Northern Ireland, which has a history of conflict (Anketell et al., 2010). As the participants within these samples are likely to have been exposed to a history of chronic trauma, the results may not generalise to other PTSD samples. In contrast, the third study recruited from a specialist psychological trauma clinic which accepted clients with a primary diagnosis of PTSD arising from exposure to a traumatic event in adulthood (Brewin & Patel's, 2010; study 2). Therefore, this sample may be more reflective of a typical PTSD sample. However, the participants were referred to the study by clinicians and consequently were not randomly selected. Whilst all three studies included exclusion criteria regarding co-morbidity of schizophrenia-spectrum disorders (i.e. a suspicion or reported diagnosis), none of the studies formally evaluated the presence of clinical presentations such as psychosis, DID or substance misuse. As such, due to differences in prevalence of voices across diagnoses (e.g. McCarthy-Jones, 2012), as well as suggested differences in voice characteristics across diagnoses (e.g. Anketell et al., 2010), this may further reduce the generalizability to other PTSD samples.

3.1.6b Clinical studies –Dissociative Identity Disorder (DID)

Four studies compared participants with a DID diagnosis to other groups of participants, including those with a diagnosis of schizophrenia (Dorahy et al., 2009; Ellason & Ross, 1995; Honig et al., 1998; Laddis & Dell, 2012). Two of these studies found that, in comparison to participants with a diagnosis of schizophrenia, participants with a diagnosis of DID reported a significantly higher prevalence of symptoms, such as hearing voices before 18 years old, hearing two or more voices, hearing children's voices, angry voices, persecutory voices and reporting other forms of hallucinations (Dorahy et al., 2009; Laddis & Dell, 2012). Additionally, logistic regression analysis with clinical (schizophrenia and DID) voice-hearing participants showed that five dependent variables (hearing two or more voices, being told what to do by voices, feeling controlled by voices, voice content relating to someone influential in your life and voices replaying past memories) were significantly predicted by the DES-T, when the DES-T was entered as the independent variable within the regression model (Dorahy et al., 2009). Further multiple regression analysis examined the differences between groups of clinical voice-hearers (schizophrenia and DID) by entering five non-dissociation subscales as dependent variables (rare symptoms, cognitive distraction, attention-seeking behaviour, factious behaviour and emotional suffering) and one dissociation subscale from the Multidimensional Inventory of Dissociation (MID; Dell, 2006) entered as a predictor or independent variable (schizophrenia=voices scale; DID=ego-alien experience). The results showed that, among participants with a diagnosis of schizophrenia, voices significantly predicted dissociation; however, among participants with a diagnosis of DID, ego-alien experiences significantly predicted dissociation (Laddis & Dell, 2012). An important limitation within this study is that multiple regression analysis conventions recommend using data from 10 participants per predictor (Field, 2009). Therefore, six predictor variables within a group of 40 participants may have resulted in a type II error. Furthermore, 20 participants in Laddis and Dell's (2012) study were asked to rate their dissociative experiences retrospectively. Consequently, the data could be biased through inaccurate memory recall and reporting.

In contrast to the significant findings reported above, Honig et al (1998) found no significant differences between schizophrenia and DID groups regarding voice prevalence and characteristics. The small sample size (schizophrenia, n=18; DID, n=15) in the study might

explain the null findings due to limits in statistical power being unable to detect differences between variables. Additionally, Honig et al (1998) employed a semi-structured interview with open and closed questions (Auditory Hallucination Interview; AHI) which may not have been sufficiently sensitive in detecting differences within the schizophrenia and DID groups. A further study reported that participants with a diagnosis of schizophrenia scored higher than participants with a diagnosis of DID on the PANSS positive, negative and general subscales (Ellason & Ross, 1995). However, a significant limitation of this study was that scores for the hallucination subscale of the PANSS was not reported for participants with these individual diagnoses, thus limiting the interpretation of the data.

3.1.6c Clinical studies – Psychosis

Thirteen studies investigated a psychosis sample (Goff et al., 1991; Kilcommons & Morrison, 2005; Lysaker & LaRocco, 2008; Maggini, et al., 2002; Offen et al., 2003a; Offen et al., 2003b; Perona-Garcelán et al., 2008; Perona-Garcelán et al., 2010; Perona-Garcelán et al., 2012a; Perona-Garcelán et al., 2012b; Spitzer, 1997; Varese et al., 2011; Varese et al., 2012). The five studies that employed a correlational design showed significant relationships between dissociation and voice-hearing (Kilcommons & Morrison, 2005; Lysaker & LaRocco, 2008; Offen et al., 2003a; Perona-Garcelán et al., 2012a; Varese et al., 2012). The eight studies employing a between-group design also showed significant relationships between dissociation and voice-hearing. The group comparisons included: 1) sexual abuse vs non-sexual abuse (Goff et al., 1991; Offen et al., 2003b); 2) schizophrenia (voice-hearing), schizophrenia (non-voice-hearing) vs non-clinical controls (Perona-Garcelán et al., 2008; Perona-Garcelán et al., 2012b; Spitzer et al., 1997; Varese et al., 2011b), and 3) depersonalisation vs non-depersonalisation groups (Maggini et al., 2002; Perona -Garcelán et al., 2010). Multiple regression analysis showed that dissociation variables predicted voices (Perona-Garcelán et al., 2008; 2012b; Varese et al., 2011b), especially under high levels of stress. Furthermore the results remained significant after controlling for paranoia (Varese et al., 2011b).

There are several limitations regarding the studies cited above that warrant mention. The majority of studies recruited relatively small samples (range: 26-71 participants), which limits

the power of studies and generalisability of results. In addition, only a limited number studies controlled for potential confounding variables (Goff et al., 1991; Kilcommons & Morrison, 2005; Perona-Garcelán et al., 2008; Perona-Garcelán et al., 2010; Perona-Garcelán et al., 2012a; Perona-Garcelán et al., 2012b Spitzer et al., 1997; Maggini et al., 2002; Varese et al., 2011b). Further to this point, none of the studies reviewed assessed or controlled for comorbid conditions (e.g. DID). Therefore, an unmeasured variable may account for the relationship between voice hearing and dissociation. Finally, the majority of studies recruited participants via mental health services, with support from staff members which may have led to sampling bias.

3.1.7 Trauma, dissociation and voice-hearing

Seventeen studies used a trauma measure (Anketell et al., 2010; Brewin & Patel, 2010; study 1 & 2; Dorahy et al., 2009; Goff et al., 1991; Honig et al., 1998; Kilcommons & Morrison, 2005; Kilcommons et al., 2008; Laddis & Dell, 2012; Lysaker & LaRocco, 2008; Offen et al., 2003a; Offen et al., 2003b; Morrison & Peterson, 2003; Perona-Garcelán et al., 2010; Perona-Garcelán et al., 2012a; Perona-Garcelán et al., 2014; Varese et al., 2012). Six studies examined the relationship between trauma exposure and voices and/or hallucination-proneness measures (Goff et al., 1991; Kilcommons & Morrison, 2005; Kilcommons et al., 2008; Morrison & Petersen, 2003; Perona-Garcelán et al., 2012a; Perona-Garcelán et al., 2014). The results showed that trauma was associated with higher scores on measures of voices and/or hallucination-proneness using correlational analysis (r values ranging from $r=.11$ to $r=.36$) and between group analyses (f values ranging from $f=6.77$ to $f=9.43$). Furthermore, Kilcommons and Morrison (2005) found that dissociative responses to trauma (particularly depersonalisation) were significant predictors of hallucinations within multiple regression analyses ($\beta=0.41$).

A further three studies investigated the relationship between trauma exposure and dissociation, reporting significant correlations (Perona-Garcelán et al., 2012a; Perona-Garcelán et al., 2014; Varese et al., 2012) with r values ranging from $r=.43$ to $r=.14$. Furthermore, significant negative correlations were found between age of first sexual abuse and dissociation (Offen et al., 2003b) and sexual abuse was found to significantly predict dissociation when controlling for the effect of stimulant abuse in a multiple regression

analysis (Goff et al., 1991). In contrast, Honig et al (1998) found no significant correlation between trauma exposure and dissociation in each voice-hearing group they examined (DID; n=15, schizophrenia; n=18 and non-patients; n=15). As highlighted previously, there were limitations to this study which may, in part, explain the null findings. In addition to what was outlined above, the measure used to explore trauma exposure (AHI) was unvalidated and relatively crude (yes/no). Therefore, its ability to examine subtle information within the data was arguably limited. Similarly, Laddis and Dell (2012) found no significant correlation between trauma exposure and dissociation in a between groups design. The three groups examined were: 1) participants with a diagnosis of schizophrenia recruited in the current study (Laddis & Dell, 2012); 2) a mixed sample of non-clinical adults (n=63), mixed psychiatric outpatients (not defined; n=67), outpatients with dissociative disorder not otherwise specified (DDNOS; n=19) and DID outpatients (n=55) recruited in a previous study (Dell, 2006); and 3) undergraduate students and their family/friends (n=125) recruited in a previous study (Somer & Dell, 2005). The lack of association between trauma and dissociation may be due to a type II error. Additionally, these findings may be potentially confounded by PTSD symptoms, as PTSD in schizophrenia is rarely ruled out. Furthermore, it is possible that dissociation in schizophrenia presents differently at the etiological level, in comparison with other clinical samples (Laddis & Dell, 2012). However, as mentioned previously, a significant limitation within this study is that half of the participants with a diagnosis of schizophrenia (n=20) were asked to complete the dissociation measure (MID) retrospectively.

3.1.8 Dissociation as a potential mediating variable

Four studies examined dissociation as a potential mediating variable (Offen et al., 2003a; Perona-Garcelán et al., 2012a; Perona-Garcelán et al., 2014; Varese et al., 2012). Of the four studies, three investigated dissociation as a potential mediating variable between the trauma and voice-hearing relationship (Perona-Garcelán et al., 2012a; Perona-Garcelán et al., 2014; Varese et al., 2012). Perona-Garcelán et al (2012a) found that depersonalisation alone mediated the relationship between childhood trauma and voices in a psychosis sample, whereas Perona-Garcelán et al (2014) found that both depersonalisation and absorption mediated the relationship between childhood trauma and hallucination-proneness within a non-clinical sample; depersonalisation and absorption together accounted for 51.38% of the

total effect. Furthermore, Varese et al (2012) found that the relationship between trauma and hallucination-proneness was mediated by dissociation in both clinical and non-clinical samples (measures of voices were not entered into the model). Specifically, dissociation was found to significantly mediate the relationship between sexual abuse and hallucination-proneness in both samples. In the non-clinical sample, dissociation also mediated the relationship between neglect/negative home environment and hallucination-proneness. Offen et al (2003b) investigated dissociation as a potential mediating variable between paternal overprotection and depression/ voice-malevolence. Results showed that dissociation mediated the relationship between paternal overprotection and depression; however, dissociation did not mediate the relationship between paternal overprotection and voice-malevolence. These results suggest that dissociation may mediate the relationship between: 1) earlier life experiences and voices; 2) earlier life experiences and hallucination-proneness; and 3) earlier life experiences and depression within voice-hearers. However, the mediation analyses did not include other potential confounding variables, such as negative affect, other psychotic experiences or demographic information.

3.2. Meta-analysis results

3.2.1 Statistical analysis for the overall sample

The results of the summary effect size (Hedges g) for the overall sample analysis ($k=19$) for the relationship between voices and total dissociation scores are presented in Figure 2. The analysis showed a significant association, with a summary effect of 1.215 (95% CI [0.995-1.436], $p < .001$). These results are suggestive of a large association between voices and dissociation, based on Cohen's (1988) criteria (i.e. $ES \geq 0.8$ indicates a 'large' effect).

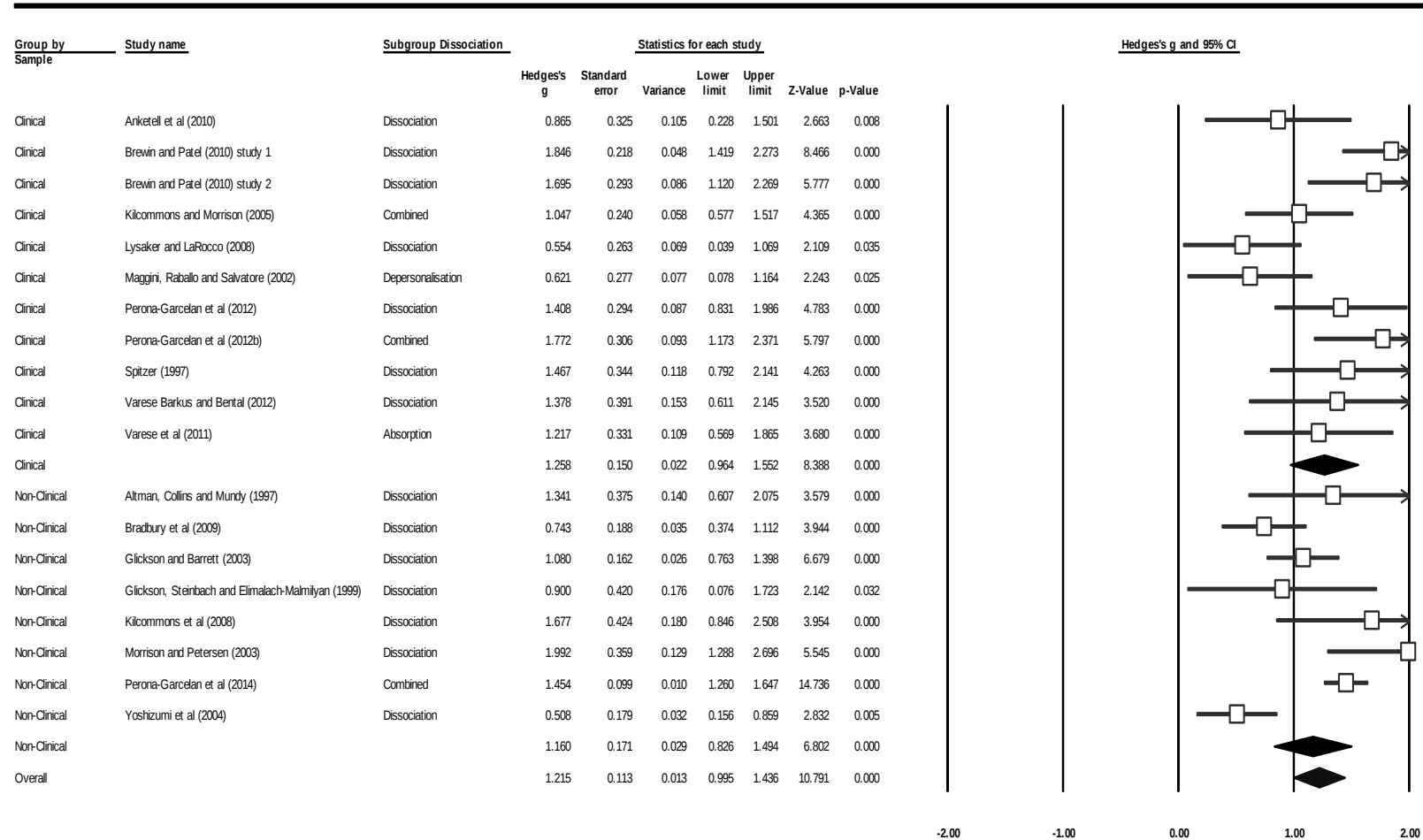


Figure 2: Forest plot of clinical, non-clinical studies and overall effect

3.2.2 Statistical analysis for clinical and non-clinical groups

Analysis of the subgroups indicated that the association between voices and dissociation was large and significant in both clinical ($k=11$, $g=1.258$, 95% CI [0.964 - 1.552], $p < .001$) and non-clinical studies ($k=8$, $g=1.160$, 95% CI [0.826 – 1.494], $p < .001$). Differences between the groups were not found to be significant ($Q=0.187$, $df=1$, $p=0.666$), indicating that the magnitude of this association was similar across clinical and non-clinical samples. Results are displayed in Figure 2.

3.2.3 Statistical analysis for subtypes of dissociation

Figure 3 shows analysis of the dissociation sub-groups. The results indicated that the relationship between voices and all types of dissociation were large and significant: depersonalisation ($k=7$, $g= 1.355$, 95% CI [1.013-1.638], $p < .001$, after the exclusion of one outlier, see section 3.2.5), absorption ($k=8$, $g= 1.221$, 95% CI [0.716-1.726], $p < .001$), amnesia ($k=4$, $g=1.028$, 95% CI [0.313-1.744], $p < .001$) and pathological dissociation ($k=2$, $g=0.939$, 95% CI [-0.030-1.908], $p < .001$). As these analyses are estimated on dependent effects (i.e. effects for absorption, depersonalisation and amnesia were often extracted from the same studies), it was not possible to statistically contrast the summary effects estimated in these different subgroup analyses (Borenstein et al., 2009).

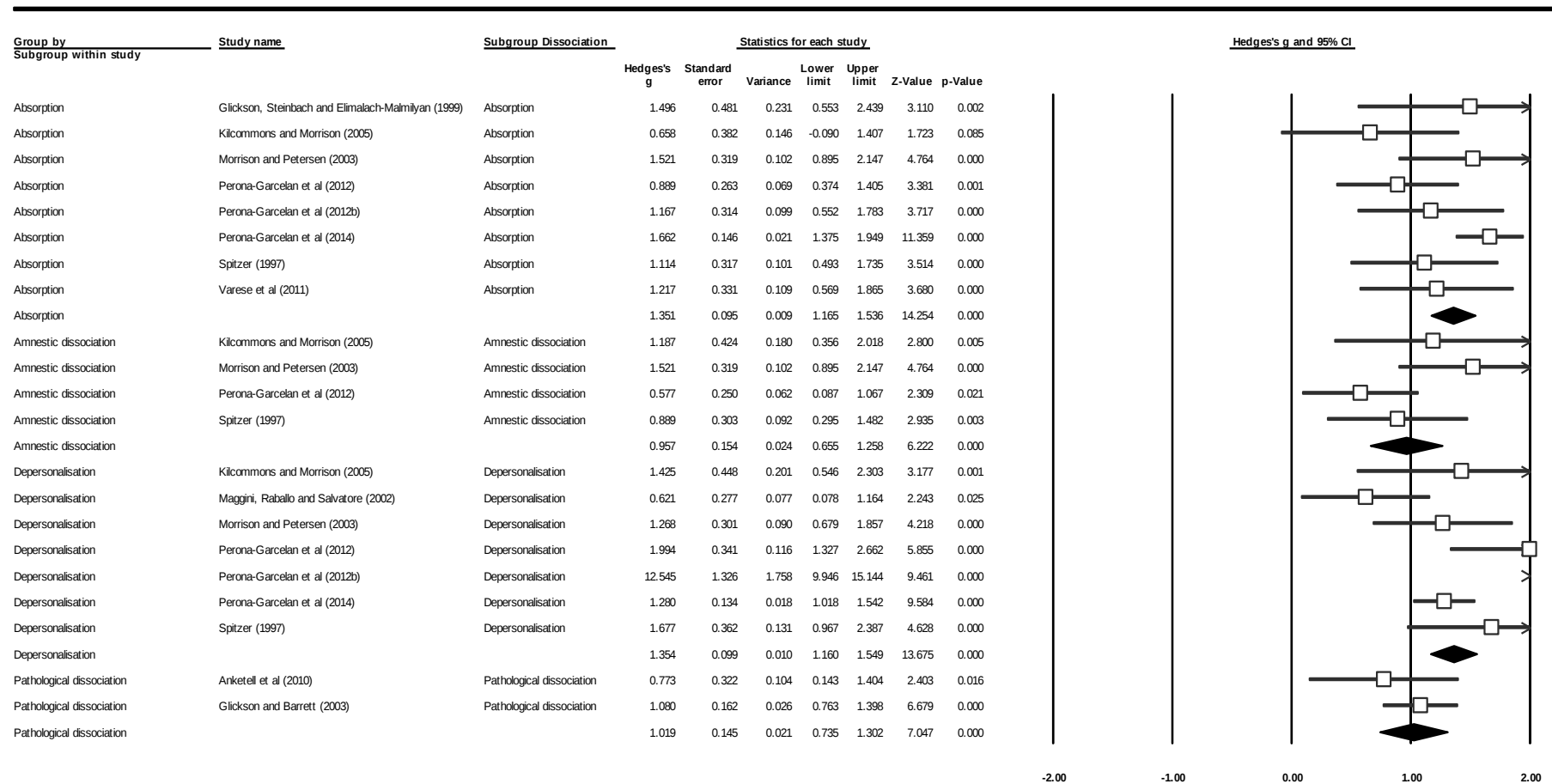


Figure 3: Forest plot of dissociation type; absorption, amnestic dissociation, depersonalisation, pathological dissociation.

3.2.4 Publication bias assessment and sensitivity analysis

According to existing conventions (i.e. $I^2 = 25\%$ = low, 50% = moderate, 75% = high heterogeneity; Higgins, Thompson, Deeks & Altman, 2003), heterogeneity analyses for the overall sample of studies indicated that the observed consistency of the effects was in the moderate-to-large range ($Q=62.997$, $df=18$, $p < 0.001$, $I^2=71.427$). Further examination of heterogeneity statistics within the subgroup analyses (clinical, non-clinical studies and depersonalisation, absorption and amnesia) revealed considerable statistical inconsistency amongst the effect considered (i.e. $I^2 > .43$; Appendix G)

Egger's test for funnel plot asymmetry (Egger et al., 1997) was applied to assess publication bias within the whole sample analyses. The results showed that Egger's test was not significant ($p=0.997$), which indicated that the results of the whole sample analysis were not influenced by publication bias or other selection bias. As the results of the Egger's test might be unreliable in meta-analyses with a small k , visual inspection of the funnel plot (Appendix G) was also carried out which revealed no evidence of funnel plot asymmetry, corroborating the above findings. In addition, trim-and-fill method was then applied to the overall sample analyses, which did not alter the pattern of findings reported in these analyses (adjusted $g=1.180$, adjusted $Q=68.044$, 95% CI [$1.001-1.426$]).

'One study removed' influence analysis was carried out in order to assess whether any of the studies had an undue influence over the meta-analytic results. These influence analyses were carried out both within the overall sample and the separate subgroup analyses. For overall sample analyses, it was hypothesised that Varese et al (2011b) may have required exclusion, due to their measure of dissociation (in which they drew items from the FFMQ, but validated it against the DES) and the study design (experience-sampling), which departed considerably from other reported studies. However, as the results of the 'one study removed analysis' showed that none of the included studies exerted undue influence on the results within the overall sample, it was concluded that this study should remain within the analysis. Similar findings were observed in the clinical and non-clinical subgroup analyses. However, within the types of dissociation subgroup, one report (Perona-Garcelán et al., 2012) was indicated to be a clear outlier that considerably inflated the summary effect obtained in the depersonalisation analysis ($k=7$, $g= 1.793$, 95% CI [$1.224-2.363$], $p < .001$). Therefore, it was

excluded from the depersonalisation sub-groups results, bringing the summary effect size for the depersonalisation subgroup to 1.355 (as reported in section 3.2.4).

4. Discussion

The aims of the current review were to systematically investigate the relationship between voice-hearing and dissociation, to evaluate the quality of the evidence and to assess the magnitude of the suggested relationship, across studies. The review identified 32 studies which examined the association between voices and/or hallucination proneness and dissociation and 19 studies for which it was possible to extract effect sizes pertaining to this relationship.

The results from the narrative review found a significant relationship between dissociation and voices and/or hallucination-proneness across a variety of non-clinical and clinical (PTSD, psychosis, DID) populations. The meta-analysis results showed that magnitude of the relationship between dissociation and voices is large within the overall sample, according to the conventional criteria proposed by Cohen (1988). Furthermore, the magnitude of this association was consistent across both clinical and non-clinical samples and dissociation subtypes (depersonalisation, amnesia and absorption). These results suggest that dissociative experiences might be implicated in voice-hearing and may potentially be a mediating factor within the well-established trauma and voice-hearing relationship (e.g. Longden et al., 2012; Moskowitz et al., 2009; Moskowitz & Corstens, 2008).

4.1 Systematic review

A large number of studies (n=17) included a trauma measure. All the studies examining associations between trauma and voices (n= 6) reported significant results, which is consistent with past research (e.g. Read et al., 2005). The majority of studies examining the relationship between trauma and dissociation did report significant results (Goff et al., 1991; Offen et al., 2003b; Perona-Garcelán et al., 2012a; Perona-Garcelán et al., 2014; Varese et al., 2012). However, two studies did not report significant results (Honig et al., 1998; Laddis & Dell, 2012), although significant limitations with these studies were identified. Findings from longitudinal studies suggested that scoring highly on the DES in childhood/ adolescence may predict development of persistent voices in later life (Escher et al 2002a; 2002b). Although childhood adversity did not predict voices in their study, Escher et al (2002a) proposed that dissociation could be a mediating factor within the relationship between trauma and voices.

Indeed, three (cross-sectional) studies reported findings which indicated that dissociation could be a potential mediating variable between trauma and voice-hearing (Perona-Garcelán et al., 2012a; Perona-Garcelán et al., 2014; Varese et al., 2012). These mediation findings provide some preliminary support to theories regarding trauma-induced dissociation increasing vulnerability to voices (e.g. Allen et al., 1997; Longden et al., 2012).

The majority of studies found significant results regardless of the disorder studied. Furthermore, non-clinical and clinical samples do not appear to differ significantly in terms of their aggregated effect sizes. These findings suggest that the link between voices and dissociation may be transdiagnostic and cut across traditional diagnostic boundaries (e.g. Moskowitz & Corstens, 2008). In contrast, Anketell et al (2010) proposed that the content of voices in psychosis is symbolically different to the content of voices in PTSD, in that the PTSD participants in their study did not obviously relate voices to past trauma and/or abuse. Furthermore, voice-hearing appeared distinctively different to other dissociative symptoms of PTSD, such as flashbacks, which have been described as an individual feeling as if they are reliving the traumatic event. Similarly, Laddis and Dell (2012) suggest that dissociation in samples of individuals diagnosed with schizophrenia-spectrum disorders present with similar dissociative experiences (e.g. intrusions and derealisation) to other clinical samples, such as individuals with a diagnosis of DID on current measures of dissociation. However, they argue that the underlying mechanisms regarding dissociative experiences may be different at the etiological level for individuals with different diagnoses, such as schizophrenia and DID. However, they have not hypothesised what the etiological differences may be.

4.2 Meta-analysis

It should be remarked that the effect sizes extracted from the studies considered in this meta-analysis varied considerably in terms of consistency, or statistical heterogeneity. These results suggest that the overall effect size might be misleading, in that the true effect size could be somewhat larger or smaller than reported. Therefore, in an attempt to interpret and determine the underlying reasons for the variation, a number of sensitivity/subgroup analyses were carried out. These analyses showed that there were no differences in the effect sizes after selection bias or publication bias were accounted for. Additionally, clinical and non-

clinical studies did not differ in effect size magnitude. These results indicated that the observed inconsistency in effect sizes are unlikely to be due to these factors. However, it is observed that there was a wide range of studies included within the analysis. Therefore, it is possible that the methodological limitations highlighted in the quality assessment, the wide range of demographic variables between samples, or an unmeasured variable may account for the relationship found between voices and dissociation. Statistical heterogeneity is likely to be affected by these sources of clinical and methodological variance, and given the relatively small number of studies included in the meta-analysis it was not possible to systematically account for all these possible determinants of heterogeneity. Therefore, it may be that the sub-group analyses were limited in explaining the heterogeneity in our findings.

4.3 Study quality/ limitations

Although consistent positive findings were reported for the relationship between voices and dissociation across the included studies, a number of methodological limitations were highlighted. The quality of the studies was examined using the EPHPP quality assessment tool, which identified the majority of studies (n=29) scored within the weak range and a minimal number of studies (n=3) scored within the moderate range. These results highlighted consistent methodological limitations across all identified studies in the area, most notably, the majority of the studies used biased samples and did not take into consideration confounding variables. Additionally, the majority of the identified studies, with the exception of Escher et al (2002a; 2002b), were cross-sectional in nature, which reflects the early stage of research in this area. As such, conclusions cannot be made regarding the direction or causation of the relationship between dissociation and voice-hearing. Although one longitudinal study suggested a positive association between DES scores and persistent voices (Escher et al., 2002a), these results require replication.

4.4 Dissociation measurement and conceptualisation

The majority of the included studies used the DES or one of its variants to measure dissociation. In terms of design, the original DES asks participants to mark on a 100-mm line an estimate of the percentage of time they experience the particular dissociative symptom. In contrast, the DES-II asks participants to circle a percentage number indicating the frequency

of which they experience the dissociative symptom. Finally, the DES-T is an eight item subscale (based on the DES-II) and is designed to measure pathological dissociation. There are a number of advantages to using these measures in that they allow for reliable comparison across studies. In addition, they have been shown to have good psychometric properties. The benefits of using the measures include their easy completion and scoring. However, limitations include the measurement of frequency rather than severity of dissociative experiences in general life, which may be less reliable/specific than if participants were asked about their experiences over the past weeks. Additionally, absorption is viewed by some authors (e.g. Waller & Ross, 1997) to be a common, non-pathological process. Therefore, it could be argued that a subscale regarding absorption should not be included in the measure. Furthermore, it has been suggested that some items on the DES (e.g. item 27) overlap with measures of voices and could potentially confound data collection. However, some of the included studies allowed for this and removed the item when analysing the DES alongside measures of voices (e.g. Perona-Garcelán, 2012a). Additionally, it could be argued that the original DES is less accurate than the DES-II and DES-T due to the methodological differences (i.e. a mark on a line). Furthermore, Brown (2006) argues that there is a need to be more specific about the types of phenomena referred to when describing dissociation and suggests that the DES total score may not be the best way of describing the range of different dissociative experiences.

As well as the measurement of dissociation, the conceptualisation of dissociation itself continues to divide opinion. Brown (2006) highlighted that the term dissociation has been applied to a vast number of psychological symptoms. The modal model of dissociation suggests a unitary construct characterised by “a disruption of normal integrative functions,” which are qualitatively similar and fall on a continuum; differences between phenomena are accounted for by the amount of dissociation experienced (in Brown, 2006). However, the concept of a dissociative continuum has been criticised. It has been argued that the continuum model has generated considerable confusion as it appears overly broad and presents fundamental differences in phenomenological distinct experiences which underpin dissociation in an unclear and vague manner (Holmes et al., 2005). Holmes et al (2005) propose two qualitatively different kinds of dissociation: detachment (an altered state of consciousness characterised by a sense of separation from aspects of everyday experience) and compartmentalization (a deficit in the ability to deliberately control processes or actions

that would normally be amenable to such control). In addition, they propose the mechanisms underlying these phenomena are different, in that detachment is a hard-wired neurobiological response to threat (Sierra & Berrios, 1998), whereas compartmentalisation results from subtle disturbances in the processes underlying consciousness and mental control (The Integrative Cognitive Model; Brown, 2004; 2013). Therefore, current measures of dissociation, despite their appropriate detections of phenomenological dissociation and good psychometric properties, are over-inclusive and are unable to detect aetiology or underlying mechanisms (e.g. Dell, 2009; Van der Hart, Nijenhuis, Steele & Brown, 2004; Laddis & Dell, 2012). As such, similarly presenting phenomena from different aetiologies across disorders cannot be subtly detected (Laddis & Dell, 2012).

4.5 Limitations of the review

The current review has a number of limitations. With regards to exclusion criteria, studies not written in the English language were omitted due to resource limitations. Furthermore, as the aim of the study was to examine the nature and magnitude of the relationship between voice-hearing and dissociation, qualitative studies were also excluded from the review. In doing so, it is acknowledged that potentially rich and detailed information may have been overlooked. The exclusion of unpublished studies may have biased the accuracy of the review on account of the ‘file drawer’ phenomenon (Rosenthal, 1979), as positive findings are more likely to be published than null findings. It is important to highlight that this phenomenon results in an over-estimation of effect size (Field, 2003). Therefore, the ‘grey literature’ (Auger, 1989) could have been more thoroughly searched and authors in the field contacted. The inclusion of peer-reviewed studies was decided upon in order to improve the reliability and validity of the review. Furthermore, the non-significant selection bias assessment within the meta-analyses suggests that any file drawer/grey literature bias may not have substantially affected the results reported in this review. Nonetheless, future reviews may employ a more comprehensive approach and systematically examine unpublished sources/reports.

It is acknowledged that the use of a quality assessment tool is flawed as these tools are subjective in nature. Indeed, quality rating tools have been associated with biased ratings and poor inter-rater reliability (The Cochrane Collaboration, 2009). In addition, according to the assessment guidelines, many studies were rated ‘weak’ methodologically because they did

not report all the information assessed by the quality assessment (i.e. uptake to the study). There is evidence to suggest that failure to report a method does not necessarily mean that it has not been used (Soares, Daniels, Kumar, Clarke, & Scott, 2004). Therefore, the current assessment tool may have underestimated the quality of included studies. Despite these issues, the EPHPP has been found to have good inter-rater reliability (Armijo-Olivo, et al., 2010) and the research team attempted to overcome any limitations of the quality assessment tool by meeting regularly to discuss studies reviewed. Furthermore, MP and a colleague independent to the review rated a proportion of the studies. It is hoped that this process may have gone some way to control for the acknowledged subjective bias in using the tool.

In terms of the meta-analysis, the results should be interpreted with caution given the small number of studies included. Hedges' method was applied in line with Field (2002) who recommends this meta-analysis method when including a limited number of studies in a bid to enhance control over the risk of finding type I errors. Further sub-group analyses could have been carried out regarding systematic differences amongst studies with different levels of methodological quality. However, as outlined above, analyses such as these were thought to be inappropriate given the small number of studies available for meta-analysis and the associated reduced variance in the studies, as the majority were considered to have weak methodologies. The review was inclusive of a wide range of studies, including clinical, non-clinical, child, adolescent and adult populations, which allows for less specific inferences to be made about particular populations. However, the current review mirrors the early stage of research within this area and does allow for wide generalizability of the results across populations. In addition, the criteria within the review did not differentiate between auditory verbal hallucinations (i.e. voices) and general auditory hallucinations, which may have included sounds. Therefore, the inclusion of these measures may not reflect a pure measure of voices. However, the inclusive nature of the review is seen as reflective of the early stage of research in the area. Therefore, the conclusions regarding the overall relationship between voices and dissociation are put forward in a cautionary manner.

4.6 Future Research

The results of the current review show that there is a clear relationship between voices and dissociation. In addition, trauma exposure appears to be associated with these two constructs. However, what is less clear is what underlying mechanisms dispose certain individuals to

experience voices and dissociation; individuals experiencing dissociation do not always hear voices and vice versa. We have a limited understanding of the mechanisms that underpin dissociative experiences, such as compartmentalisation and detachment (e.g. Kennerley & Kischka, 2013), and the extent to which some of these mechanisms might overlap or interact with cognitive processes believed to underlie hallucinatory experiences (Bentall, 1990; Waters, Woodward, Allen, Aleman, & Sommer, 2012; Brookwell, Bentall & Varese, 2013). Therefore, research from a cognitive, neurobiological or neuropsychological perspective may provide further insight. Additionally, longitudinal studies which consider random sampling techniques and control for potential confounding variables are recommended with a view to exploring the aetiology of the relationship between voices and dissociation and possibly their shared mechanisms. As the studies included in the review showed that trauma (e.g. Varese et al., 2012) and quality of childhood relationships (e.g. Offen et al., 2003a) have implications in the development of dissociation and voices, the experience of trauma and early relationships should also be taken into account in future studies. It is possible that the introduction of interpersonal psychological theories, such as attachment theory (Bowlby, 1969) may also be indicated (Offen et al., 2003a). Future studies should utilise pure continuous measures of voices. Studies using the DES should report the subscale totals, rather than simply the total score, to allow for comparison of different subtypes of dissociation. Furthermore, robust measures of dissociation subtypes should be developed to measure the aetiology of the experience. In order to explore whether the underlying mechanisms are different in different disorders, formal assessment of co-morbidity is recommended. Furthermore, an operational definition of dissociation within disorders such as psychosis (Newman-Taylor & Sambrook, 2013) may be helpful in guiding such research.

4.7 Clinical implications

The findings of the current review confirm the importance of early intervention in voice-hearing. When voices are reported during clinical assessment, it is advisable to routinely enquire about the experience of dissociation (Newman-Taylor & Sambrook, 2013) and trauma (Read, 2006). Therefore, information regarding dissociative experiences and traumatic experiences should inform idiosyncratic formulations regarding the development and maintenance of distressing voices. Furthermore, interventions should be designed to target dissociative experiences as well as voices. Newman-Taylor and Sambrook (2013)

outline a helpful framework in developing interventions focused upon dissociative experiences which are unlikely to cause high levels of emotion in individuals experiencing distressing psychosis. They recommend supporting individuals to use grounding and other distress tolerance skills early in therapeutic work, with a view to supporting an extended formulation in order to help individuals develop a clear understanding of their current difficulties. It is thought that the techniques outlined are transferable across disorders. Indeed, the results of this review showed that both dissociation and voice-hearing are transdiagnostic and significantly associated. Consequently, we may need to move away from the view that these constructs are mainly prevalent in individuals with a particular diagnosis.

5. Conclusion

In summary, the current review is the first in the area of dissociation and voice-hearing which has aimed to bring a broad and varied range of studies together. The findings are presented with caution, as the research thus far is developing and there a number of limitations to consider. Nonetheless, the evidence synthesised within the current review shows a strong relationship between dissociation and voice-hearing. It is recommended that further research is undertaken in this area with a view to developing our understanding regarding this relationship.

6. References

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**Does insecure-attachment mediate the relationship between
trauma and voice-hearing in psychosis?**

The following paper has been prepared for submission to 'Schizophrenia Research.' The guidelines for authors are presented in appendix B.

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Abstract

The current study aimed to investigate the associations between trauma, insecure-attachment and dimensions of voice-hearing and explore the potential mediating role of insecure attachment within this relationship. The study had a cross-sectional design and included 55 voice-hearers with a diagnosis of psychosis. Participants were recruited from acute and community settings and completed self-report measures investigating experiences of childhood trauma, insecure-attachment, voice-related severity and distress, beliefs about voices, relationships with voices and perceptions of social rank. The results showed that insecure-anxious attachment was significantly associated with the voice-hearing dimensions examined. However, insecure-avoidant attachment was not associated with dimensions of voice-hearing. Mediation analysis showed that insecure-anxious attachment mediated the relationship between childhood sexual and emotional abuse and voice-related severity and distress, voice-malevolence, voice-omnipotence, voice-resistance and hearer-dependence. Furthermore, insecure-anxious attachment mediated the relationship between childhood physical neglect and voice-related severity and distress and hearer-dependence. The findings suggest attachment theory may help develop our understanding of the relationship between trauma and voice-hearing.

Key words: voices, auditory hallucinations, attachment theory, interpersonal theory, social rank.

1. Introduction

Distressing voices (auditory hallucinations) often occur in the context of psychosis (e.g. Moritz & Larøi, 2008); it has been estimated that 70% of individuals diagnosed with schizophrenia spectrum disorders hear voices (McCarthy-Jones, 2012). It is now well established that the experience of childhood adversity can increase the risk of developing psychosis (Varese et al., 2012). Interpersonal traumas such as childhood bullying, physical, sexual and emotional abuse have particularly been linked to voice-hearing (Bentall, Wickham, Shelvin & Varese, 2012).

Arguably, the cognitive model of voices is the most well-established psychological model of voices. This model proposes that distress in relation to voice-hearing is influenced by beliefs or appraisals about voices and is maintained by affective and behavioural responses (e.g. Chadwick & Birchwood, 1994; Morrison 1998; 2001). In support of the cognitive model, there is evidence that voices appraised as malevolent and/or powerful are associated with significant distress. In comparison, voices appraised as benevolent are thought to be less distressing (Mawson, Cohen & Berry, 2010). Additionally, there is evidence that voice-malevolence is associated with resistance (i.e. reluctance/non-compliance with voice content), whereas voice-benevolence is associated with engagement with voices (i.e. elective listening and attempts to regularly hear voices; Sayer, Ritter & Gournay, 2000).

It has been proposed that voice appraisals and patterns of relating to voices are significantly influenced by interpersonal relationship experiences within an individual's external social world (Chadwick & Birchwood, 1994). Focusing specifically on perceptions of power and control, Birchwood et al. (2004) found that an individual's perception of being powerless and controlled by others within external social relationships is reflected within the voice-hearer relationship. Additionally, Hayward (2003) found similarities between individual's styles of relating to their voices and their styles of relating to others in terms of both power and intimacy. Consequently, the voice-hearing experience has been understood in terms of an individual being in a meaningful interpersonal relationship with their voice, involving interaction and identification of the voice as an 'other' with knowledge, intent and history (Hayward & Fuller, 2010). The concept of being in an interpersonal relationship with a voice has both been accepted and rejected by voice-hearers (Chin, Hayward & Drinnan, 2009).

Additional empirical evidence suggests that not only perceptions of current social relationships but also past interpersonal relationships can impact on beliefs about voices and the nature of relationships with voices. For example, Offen, Waller and Thomas (2003) found that voice-malevolence was associated with low levels of parental care, high levels of overprotection and experience of childhood sexual abuse (CSA) at an early age. Furthermore, Andrew, Gray and Snowden (2008) found that number of traumatic events, history of CSA and symptoms of post-traumatic stress disorder significantly predicted negative beliefs about voices.

The potential influence of interpersonal relationships and early relational trauma on the voice-hearing experience suggests that Bowlby's (1969) attachment theory may help to develop understanding of distressing voices (Berry, Barrowclough & Wearden, 2007; Longden, Madhill & Waterman 2012; Read & Gumley, 2008). Attachment theory is a key developmental theory of interpersonal relationships. According to Bowlby (1969), earlier experiences of caregiving influence methods of regulating distress and interpersonal functioning in adulthood via 'internal working models.' Experiences of responsive and sensitive caregiving lead to the development of a secure attachment style which is associated with a positive self-image, a capacity to manage negative affect and appropriate levels of comfort or autonomy in relationships with others. Conversely, sub-optimal experiences of caregiving lead to the development of insecure-attachment styles. Adult insecure-attachment is frequently conceptualised in terms of two dimensions: insecure-anxious and insecure-avoidant attachment (e.g. Hazan & Shaver, 1987). An insecure-anxious attachment is associated with a negative image of the self, an overly dependent interpersonal style, fear of rejection and a tendency to become overwhelmed by negative affect. It is thought to develop in response to caregivers who are inconsistently available or relate overly intrusively towards the infant. An insecure-avoidant attachment is associated with a negative image of others, interpersonal hostility, social withdrawal and minimisation of affect. It is thought to develop in response to caregivers who are consistently emotionally unavailable, critical and rejecting towards the infant.

It has been proposed that earlier interpersonal traumas increase vulnerability to the development of voice-hearing via disruptions in the attachment system (Longden et al., 2012). It has also been argued that insecure-attachment styles may maintain voice-related distress by impacting on beliefs about, and ways of relating to, voices (Berry, et al., 2007).

Thus far, relatively few studies have investigated associations between attachment patterns and voice-hearing. However, there is evidence of associations between insecure-attachment and voice-related distress (Berry, Wearden, Oakland, Bradley & Barrowclough, 2012; Ponizovsky, Vitenberg, Baumgarten-Katz, & Grinshpoon, 2013; Robson & Mason, 2014) and associations between insecure-avoidant attachment and themes of rejection, criticism and threat in the voice-hearing experience (Berry et al., 2012). In a sample of 44 voice-hearing participants recruited via the internet, Robson and Mason (2014) found that insecure-avoidant attachment was associated with voice-intrusiveness (i.e. voice perceived by hearer as intrusive) and hearer-distance (i.e. hearer related to their voice from a distanced position), and insecure-anxious attachment was related to voice-intrusiveness and hearer-dependence (i.e. individual relates to their voice from a dependent position). Furthermore, the relationship between insecure-attachment and voice-related distress was mediated by voice-malevolence and voice-omnipotence. Whilst these studies highlight the possible role of attachment within the voice-hearer relationship, there are some limitations, including recruitment of non-clinical samples, not integrating important elements of the cognitive model of voices (e.g. social rank) and not measuring trauma.

As such, the current study has two aims: 1) to explore associations between trauma, insecure-attachment and dimensions of voice-hearing in psychosis; and 2) to explore whether insecure-attachment has a mediating role within the trauma and voice-hearing relationship. Three primary hypotheses were identified. Firstly, insecure-attachment (both insecure-avoidant and insecure-anxious attachment) will be positively associated with voice-related severity and distress. Secondly, insecure-attachment (both insecure-avoidant and insecure-anxious attachment) will mediate the relationship between trauma and voice-related distress. In addition, a number of secondary hypotheses were identified. It was hypothesised that insecure-anxious attachment, which is characterised by a tendency for individuals to be dependent on others for a sense of self-worth, will be positively associated with voice-benevolence, voice-omnipotence, voice-dominance, voice-intrusiveness, voice-engagement and hearer-dependence, and negative perceptions of social rank. Furthermore, it was hypothesised that insecure-avoidant attachment, which is characterised by negative beliefs about others and the devaluing of social relationships, will be positively associated with voice-malevolence, voice-omnipotence and voice-dominance and greater relational distance from voices, in addition to negative perceptions of social rank.

2. Method

2.1 Participants

Participants were recruited from in-patient and out-patient services within four mental health Trusts, one independent hospital and voluntary services (e.g. Hearing Voices Network) across the North West of England between July 2013 and March 2014. The inclusion criteria were: 1) diagnosis of a psychotic disorder (schizophrenia, schizoaffective disorder, schizophreniform disorder, delusional disorder or psychosis not otherwise specified (NOS); 2) presence of voices within the past week, as indicated by a score of three or above on the Positive and Negative Syndrome Scale –Auditory Hallucination (P3) item (PANSS-AH; Kay, Fiszbein, & Opler, 1987); and 3) aged 18 and over. Participants were excluded if: 1) they were not fluent in English; 2) the cause of voices was judged to be due to organic factors (assessed by clinical team); and 3) they were unable to provide informed consent. The study was approved by the local ethical research committee (Appendix C). Sixty-seven potential participants were initially identified and agreed to take part in the study. One individual did not meet the inclusion criteria, three withdrew at an early stage during the interview and eight declined when the researcher approached them at a later date. Therefore, a total of 55 (82%) participants completed the study.

2.2 Procedure and measures

Potential participants were identified and either approached by staff working within services or volunteered through a HVN group setting. Individuals willing to take part met with the researcher to discuss the study and obtain informed consent. Participants completed the measures in the order presented below (Appendices H-M). Having completed the measures, participants were de-briefed and reimbursed a nominal fee for their time.

Psychotic Symptom Rating Scales–Auditory Hallucinations Scale (PSYRATS-AH; Haddock, McCarron, Tarrier & Faragher, 1999). The AH scale of the PSYRATS was used to determine severity and distress in relation to voices. This subscale is comprised of 11 items relating to the experience of auditory hallucinations (e.g. frequency, intensity, distress and duration) over the past week.

Beliefs about Voices Questionnaire-Revised (BAVQ-R; Chadwick, Lees & Birchwood, 2000). This 35-item self-report questionnaire measures the beliefs an individual holds about his or her dominant voice. There are five subscales: voice-malevolence, voice-benevolence, voice-omnipotence, voice-resistance and voice-engagement.

The Voice and You (VAY; Hayward, Denney, Vaughan, & Fowler, 2008). The VAY is a self-report measure of inter-relating between the participant and his or her dominant voice. There are 28 items divided into four subscales: hearer-distance, hearer-dependence, voice-dominance (i.e. voice perceived by hearer as dominant) and voice-intrusiveness.

Childhood Trauma Questionnaire (CTQ; Bernstein et al, 1994). The CTQ is a self-report, retrospective measure of the severity and frequency of childhood (0-17 years old) maltreatment. This questionnaire consists of 28 items and is divided into five subscales: emotional, sexual and physical abuse and emotional and physical neglect.

Psychosis Attachment Measure (PAM; Berry, Barrowclough & Wearden, 2008). The PAM is a 16-item self-report psychosis attachment measure, which assesses insecure-anxious and insecure-avoidant attachment in the context of current close relationships in adulthood (Berry, Barrowclough, & Wearden, 2006). A total score is obtained by averaging an individual's item scores for each dimension. Higher scores indicate higher levels of insecure-anxious and insecure-avoidant attachment.

The Social Comparison Scale (SCS; Allan & Gilbert, 1995). The SCS is an 11-item measure originally designed to assess perceived social status in individuals with a diagnosis of depression (Allan & Gilbert, 1995). The scale has been previously used in studies with individuals with a diagnosis of psychosis (e.g. Birchwood, Meaden, Trower, Gilbert, & Plaistow, 2000) and includes six items regarding perceived competence, superiority, acceptance, likability, difference and confidence.

2.3 Data Analysis

Data were analysed using SPSS for windows (version 20) and Stata (version 9). The study was a cross-sectional correlational design. The data was examined for skewness and kurtosis. Two variables were transformed using logarithmic functions; CTQ-physical abuse and CTQ-sexual abuse. As all the variables met parametric assumptions following transformations, associations between two continuous measures were assessed using Pearson's correlation coefficient. To explore the mediation hypotheses, the variables found to be significant within the correlational analysis were entered into the mediation analysis. This involved estimating parameters from three regression models: 1) the effect of the independent variable on the dependent variable; 2) the effect of the independent variable on the mediator and; 3) the effect of the mediator and the independent variable on the dependent variable in the same model. Indirect effects were calculated by multiplying the coefficient of the independent variable in model 2 and the coefficient of the mediator in model 3; the direct effect is the coefficient of the independent variable in model 3. A statistically significant indirect effect provides evidence of mediation, and bootstrapping with 1,000 replications was used (Preacher & Hayes, 2004). There was limited missing data; exact numbers for each analysis (n) are presented within the Tables.

3. Results

3.1 Demographic and clinical information

Table 1 presents demographic and clinical information. The participants were sampled across the age range and the majority were male, White-British, single status, living in either rented or another form of accommodation and having gained either GCSE level or no form of educational attainment. The most prevalent diagnosis was schizophrenia. Participants described a wide range of experiences regarding length of time hearing voices, age of voice onset and number of hospital admissions.

Table 1: Demographic and clinical information (N=55)

Demographic/clinical information	Subgroup	Descriptive statistic
Age Mean (SD)		42.16 (11.33)
Range (years)		21-66
Gender n (%)	Male	44 (80)
	Female	11 (20)
Ethnicity n (%)	White British	46 (83.6)
	Black British	3 (5.5)
	Mixed race	6 (10.9)
	Other ethnicity	0 (0)
Marital Status n (%)	Single	44 (80)
	Co-habiting	3 (5.5)
	Married	4 (7.3)
	Separated/Divorced	4 (7.3)
Educational attainment n (%)	None	22 (40)
	GCSE or equivalent	25 (45)
	A-Level or equivalent	6 (10.9)
	Higher education	2 (3.6)
Accommodation n (%)	Own home	10 (18.3)
	Rented accommodation	17 (30.9)
	Supported flat/home	3 (5.5)
	Live with parents	7 (12.7)
	No fixed abode	3 (5.5)
	Other (eg. rehab ward)	15 (27)
Diagnosis n (%)	Schizophrenia	44 (80)
	Schizoaffective	6 (10.9)
	Psychosis (not otherwise specified)	5 (9.1)
Age of Voice Onset Mean (SD)		24.16 (10.86)
Range		5-52
Length of Time Hearing Voices (months and years) Mean (SD)		16.72 (11.62)
Range		1 month - 43years
Number of Hospital Admissions Median (Range)		3 (0-20)
PAM Mean (SD)	Insecure-anxious attachment	18.29 (6.53)
	Insecure-avoidant attachment	20.36 (4.51)
CTQ Mean (SD)	Emotional abuse	10.40 (7.35)
	Physical abuse	.936 (.243)
	Sexual abuse	.924 (.276)
	Emotional neglect	11.87 (5.75)
	Physical neglect	9.04 (5.04)
PSYRATS Mean (SD)	AH-total score	27.78 (6.80)
BAVQ-R Mean (SD)	Malevolence	15.91 (5.15)
	Benevolence	11.40 (5.21)
	Omnipotence	16.11(4.74)
	Resistance	25.58 (7.17)
	Engagement	14.62 (5.38)
VAY Mean (SD)	Voice-dominance	18.55 (5.87)
	Voice-intrusiveness	12.67 (4.25)
	Hearer-dependence	16.20 (5.28)
	Hearer-distance	18.36 (5.90)
SCS Mean (SD) (n=54)	Total score	30.02 (11.34)

3.2 Primary hypotheses: insecure-attachment and voice-related severity and distress

As predicted, significant positive correlations were found between insecure-anxious attachment and the PSYRATS-AH. Contrary to predictions, no significant correlations were found between insecure-avoidant attachment and the PSYRATS-AH (Table 2).

3.2.1 Insecure-attachment as a mediating variable between childhood trauma and voice-related severity and distress

Only variables with significant correlations in line with the mediation hypothesis were carried forward for the mediation analysis. Therefore, only insecure-anxious attachment was entered as a potential mediator variable as no significant correlations were evident between insecure-avoidant attachment and PSYRATS-AH. Additionally, as insecure-anxious attachment was not significantly correlated with CTQ physical abuse and CTQ emotional neglect they were not entered as independent variables. Consequently, CTQ sexual abuse, emotional abuse and physical neglect were entered as independent variables and PSYRATS-AH, as the dependent variable. As predicted, insecure-anxious attachment mediated the relationship between: 1) CTQ sexual abuse and PSYRATS-AH; 2) CTQ emotional abuse and PSYRATS-AH and; 3) CTQ physical neglect and PSYRATS-AH.

3.3 Secondary hypotheses: insecure-attachment, beliefs about voices, relationship with voices and social rank

As hypothesised, significant positive correlations were found between insecure-anxious attachment and voice-omnipotence, voice-dominance, voice-intrusiveness, hearer-dependence and SCS. However, contrary to hypotheses, no significant correlations were found between insecure-anxious attachment and voice-benevolence or voice-engagement. Furthermore, significant correlations were found between insecure-anxious attachment and hearer-distance, voice-malevolence and voice-resistance (Table 2). In contrast to hypotheses, no significant correlations were found between insecure-avoidant attachment and voice-malevolence, voice-omnipotence, voice-resistance, voice-dominance, hearer-distance and SCS (Table 2).

3.3.1 Insecure-attachment as a mediating variable between childhood trauma and beliefs about voices, relationship with voices and social rank

Of the secondary hypotheses voice-malevolence, voice-omnipotence, voice-resistance, voice-dominance, voice-intrusiveness, hearer-dependence, hearer-distance and SCS were significantly correlated with insecure-anxious attachment and were therefore entered as dependent variables into the mediation analysis. As mentioned above, insecure attachment was significantly associated with CTQ sexual abuse, emotional abuse and physical neglect variables and therefore they were entered as independent variables into the mediation analysis. Results showed that insecure-anxious attachment mediated the relationship between CTQ sexual abuse and voice-malevolence, voice-omnipotence, voice-resistance and hearer-dependence. Furthermore, insecure-anxious attachment was found to significantly mediate the relationship between CTQ emotional abuse and voice-malevolence, voice-omnipotence, voice-resistance and hearer-dependence. Finally, insecure-anxious attachment mediated the relationship between CTQ physical neglect and hearer-dependence (Table 3).

Table 2: Associations between insecure-attachment, trauma and dimensions of voice-hearing

Measure	Subscale	Insecure-anxious attachment			Insecure-avoidant attachment		
		N	Test Statistic	P value	N	Test Statistic	P value
CTQ	Emotional abuse	55	$r = .345^{**}$	.010	55	$r = .291^*$	.031
	Physical abuse	55	$r = .181$	.187	55	$r = .325^*$	.015
	Sexual abuse	55	$r = .336^*$	.012	55	$r = .299^*$	.027
	Emotional neglect	55	$r = .198$	.147	55	$r = .371^{**}$	.005
	Physical neglect	55	$r = .285^*$	.035	55	$r = .304^*$	.024
PSYRATS	AH-total score	55	$r = .422^*$	.001	55	$r = .211$	.123
BAVQ-R	Malevolence	55	$r = .299^*$	.027	55	$r = .171$	.211
	Benevolence	55	$r = -.075$	.588	55	$r = -.128$	.353
	Omnipotence	55	$r = .399^{**}$	.003	55	$r = .225$	.098
	Resistance	55	$r = .472^{**}$	.000	55	$r = .056$	.683
	Engagement	55	$r = .065$	.636	55	$r = -.107$	.437
VAY	Voice Dominance	55	$r = .330^*$	.014	55	$r = .056$	.685
	Voice Intrusiveness	55	$r = .300^*$	.026	55	$r = .135$	.326
	Hearer Dependence	55	$r = .423^{**}$	.001	55	$r = .070$	.611
	Hearer Distance	55	$r = .284^*$	.035	55	$r = -.033$	.812
SCS	Total score	54	$r = -.295^*$	.030	54	$r = -.260$	.058

* = $p < .05$; ** = $p < .01$

Table 4: Indirect, direct and total effects for the relationship between trauma and dimensions of voices, mediated by insecure-anxious attachment

Independent Variable (CTQ subscale)	Dependent Variable:		Indirect effect (95% confidence interval)	Direct effect (95% confidence interval)	Total effect (95% confidence interval)	P Value (indirect effect)
	Measure	Subscale				
Sexual Abuse	PSYRATS	AH-total score	.138 (.024-.253)	.025 (-.218-.268)	.163(-.092-.418)	.018*
		Malevolence	.086 (.001-.171)	-.115 (-.325-.095)	-.029 (-.244-.186)	.049*
	BAVQ-R	Omnipotence	.090 (.004-.176)	-.012 (-.197-.173)	.078 (-.115-.271)	.040*
		Resistance	.156 (.026-.287)	.020 (-.224-.265)	.177 (-.087-.440)	.018*
	VAY	Voice Dominance	.090 (-.006-.187)	.005 (.234-.243)	.095 (-.145-.335)	.065
		Voice Intrusiveness	.051(-.012-.114)	.074 (-.073-.222)	.125 (-.027-.278)	.114
		Hearer-dependence	.112 (.007-.216)	-.058 (-.234-.119)	.054 (-.122-.230)	.036*
		Hearer-distance	.063 (-.028-.154)	.129 (-.109-.367)	.193 (-.045-.430)	.172
	SCS	Total score	-.131 (-.309-.047)	-.243 (-.636-.150)	-.373 (-.747-0.000)	.151
	PSYRATS	AH-total score	.138 (.024-.253)	.025 (-.218-.268)	.163 (-.091-.418)	.002**
Emotional abuse	BAVQ-R	Malevolence	.086 (.001-.171)	-.115 (-.325-.095)	-.029 (-.244-.186)	.049*
		Omnipotence	.090 (.004-.176)	-.012 (-.197-.173)	.078 (-.115-.271)	.040*
	VAY	Resistance	.156 (.026-.287)	.020 (-.224-.265)	.177 (-.087-.440)	.018*
		Voice Dominance	.090 (.005-.187)	.005 (-.234-.243)	.095 (-.145-.335)	.065
		Voice Intrusiveness	.051 (-.012-.114)	.074 (-.073-.222)	.125 (-.027-.278)	.114
		Hearer-dependence	.112 (.007-.216)	-.058 (-.234-.119)	.054 (-.122-.230)	.036*
	SCS	Hearer-distance	.063 (-.028-.154)	.129 (-.109-.367)	.193 (-.045-.430)	.172
		Total score	-.131 (-.309-.047)	-.243 (-.636-.150)	-.373 (-.747--.835)	.151
	PSYRATS	AH-total score	.156 (.003-.310)	.168 (-.126-.461)	.324 (.007-.641)	.046*
		Malevolence	.085 (-.016-.186)	.027 (-.247-.300)	.112 (-.168-.391)	.099
Physical Neglect	BAVQ-R	Omnipotence	.101(-.004-.206)	.071(-.158-.299)	.172 (-.052-.396)	.059
		Resistance	.197 (-.007-.310)	-.067 (-.388-.254)	.130 (-.225-.484)	.058
	VAY	Voice Dominance	.095(-.022-.213)	.172 (-.097-.441)	.267 (-.012-.547)	.112
		Voice Intrusiveness	.061 (-.020-.143)	.132 (-.111-.375)	.194 (-.051-.438)	.139
		Hearer-dependence	.124 (.005-.243)	.020 (-.195-.234)	.144 (-.065-.353)	.041*
		Hearer-distance	.082 (-.039-.204)	.152 (-.127-.432)	.235 (-.044-.514)	.185
	SCS	Total score	-.164 (-.414-.086)	-.331(.834-.172)	.495 (-.985--.005)	.199

* $=p < .05$; ** $=p < .01$

4. Discussion

The aims of the current study were to explore associations between trauma, insecure-attachment and dimensions of voice-hearing and to examine insecure-attachment as a potential mediator between trauma and voice-hearing in the context of psychosis. Insecure-anxious attachment was found to be significantly associated with voice-related severity and distress and further dimensions of voice-hearing, including, voice-omnipotence voice-dominance, voice-intrusiveness, hearer-dependence and social rank. However, no associations were found between insecure-avoidant attachment and voice-related severity and distress or the additional dimensions of voice-hearing that were explored. Mediation analyses showed that insecure-anxious attachment mediated the relationship between childhood trauma (sexual abuse, emotional abuse, physical neglect) and voice-related severity and distress. Insecure-anxious attachment also mediated the relationship between childhood sexual/emotional abuse and voice-malevolence, voice-omnipotence, voice-resistance and hearer-dependence and childhood physical neglect and hearer-dependence.

In line with previous research, insecure-anxious attachment was positively associated with voice-related severity and distress, whereas insecure-avoidant attachment was not associated with voice-related severity and distress (Berry et al, 2012; Ponizovsky et al, 2013). These findings are in keeping with current understandings regarding insecure-attachment and emotional regulation. Individual's with an insecure-anxious attachment are likely to experience difficulties regulating negative affect and consequently may become overwhelmed by the voice-hearing experience. In contrast, individuals with an insecure-avoidant attachment are likely to suppress or distance themselves from negative affect related to voice-hearing. However, at times of crisis, negative affect may be so overwhelming that this emotional regulation strategy is no longer effective (Mikulincer & Shaver, 2007).

Insecure-anxious attachment was found to play a mediating role in the relationship between childhood trauma and voice-related severity and distress. These findings lend support to attachment theory contributing to our understanding of the mechanisms underlying distressing voices (Berry, et al., 2007; Longden, et al., 2012; Read & Gumley, 2008). Based on the findings from the current study, a model is proposed which shows the relationship between trauma and voice-hearing as mediated by insecure-anxious attachment (Figure 1). It

is now well-established that early interpersonal trauma is strongly implicated in voice-hearing (e.g. Bentall et al, 2012) and sub-optimal experiences of early caregiving, including traumatic experiences, impact on later interpersonal relationships and attachment patterns (Bowlby, 1969). It is suggested, albeit cautiously, that insecure-attachment is one important factor that may influence the way in which an individual appraises and relates to a voice-hearing experience; individuals with an insecure-attachment pattern will likely hold negative appraisals about their voice and relate to their voice in a maladaptive way which consequently, influences voice-related distress.

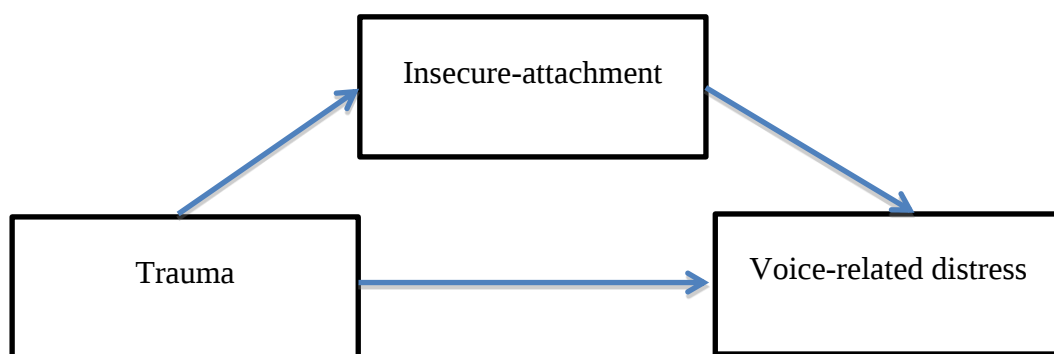


Figure 1: The indirect effect of insecure-attachment on trauma and voice-related distress

As current understandings regarding insecure-anxious attachment view individuals as having a tendency for being dependent on others for a sense of self-worth, associations between insecure-anxious attachment and voice-malevolence, voice-omnipotence, hearer-dependence, voice-dominance and voice-intrusiveness were expected. Our results were consistent with these predictions and that of previous research (Robson & Mason, 2014). In contrast to predictions, associations were also found between insecure-anxious attachment and voice-resistance/hearer-distance, although these findings were consistent with Robson and Mason's (2014) results. These findings, which are contradictory to hypotheses, may be consistent with understandings of insecure-disorganised attachment patterns. Insecure-disorganised attachment has been consistently linked to early relational trauma (e.g. Schuengel, Bakersman-Kranenburg & Van Ijzendoorn, 1999) and has been characterised by a lack of consistent or contradictory interpersonal and affect regulation strategies (Read & Gumley, 2008). The attachment measure used within the current study does not include an insecure-disorganised dimension of attachment. Therefore, it is possible that individuals with insecure-

disorganised patterns of relating may have scored highly upon insecure-anxious and insecure-avoidant dimensions of attachment, in that they seek relationships but are avoidant of them due to fear of rejection and negative perceptions of others. Furthermore, in contrast to previous research (Robson & Mason, 2014), no associations were found between insecure-avoidant attachment and beliefs about voices or relationship with voices. As individuals with insecure-avoidant attachment have been described as dismissing and devaluing of relationships (Bartholomew & Horowitz, 1991), this finding may suggest that individuals scoring high on this domain may not have conceptualised their voice as an ‘other’ (Chin et al, 2009). Therefore, participants may have experienced difficulties in providing consistent responses to questionnaire items.

In terms of social comparisons to others, significant associations were found between insecure-anxious attachment and negative perceptions of social rank. Contrary to expectations, no significant associations were found between insecure-avoidant attachment and negative perceptions of social rank, although the relationship was approaching statistical significance ($p=.058$). Limited research has been carried out in the area of attachment and social rank in mental health samples. However, one study found no significant associations between insecure-attachment dimensions and social rank in a sample of individuals diagnosed with bipolar disorder (Gilbert, McEwan, Hay, Irons & Cheung, 2007). Gilbert et al (2007) utilised the adult attachment scale (Collins & Read, 1990), which consists of three subscales: depend (i.e. dependence on others), anxiety (i.e. fear of abandonment) and closeness (i.e. ease of getting close to others). Gilbert et al (2007) attribute their findings to high scores on depression measures and bi-modal scores on the SCS. That is, as high or low manic symptoms were not controlled for, it is possible that results may have been influenced by the noted extremes in affect. As it is unlikely that the participants in the current study experienced such levels of extreme affect, it is possible that, just as individuals with psychosis report feeling down-ranked in relation to their voice, they might also feel down-ranked in relation to others and their primary caregiver, if the relationship is sub-optimal.

Whilst not the focus of the current study, a post hoc mediation model similar to Robson and Mason’s (2014) was investigated. Beliefs about voices and nature of relationships with voices were entered as the mediation variables (indirect effect) between the insecure-attachment and voice-related distress relationship. Mixed results were found. Similar to Robson and Mason

(2014), the relationship between insecure-anxious attachment and voice-related distress was mediated by voice-malevolence (indirect effect= .179, 95% CI= .017-.342, $p=.031$), voice-omnipotence (indirect effect= .203, 95% CI= .050-.356, $p=.009$) and voice-resistance (indirect effect= .213, 95% CI= .042-.384, $p=.014$). In contrast to Robson and Mason (2014), an indirect effect of hearer-distance and voice-dominance between the insecure-anxious attachment and voice-related distress relationship was not found. Furthermore, voice-omnipotence and voice-malevolence did not mediate the relationship between insecure-avoidant attachment and voice-related distress. These contradictory results may be related to the studies using different measures of voice-related distress. For example, the distress measure used in the current study was the PSYRATS-AH (Haddock et al., 1999), whilst Robson and Mason (2014) used a 5-point Likert scale from 0 (no distress) to 5 (extremely distressed). Furthermore, the participants within the current study were recruited from a clinical population, as opposed to a non-clinical sample in the Robson and Mason (2014) study. It is likely that clinical participants would be significantly more distressed than non-clinical participants. Therefore, clinical participants may find it more difficult to relate to their voice from a distanced position (hearer-distance). Finally, both studies recruited modest sample sizes. Therefore, larger samples would be more able to rigorously explore this mediation model.

4.1 Limitations

The current study has a number of limitations. The cross-sectional design of the current study means that conclusions cannot be made regarding the direction or causation between variables. Furthermore, self-report measures may not be adequate in detecting subtle associations within insecure-avoidant attachment and voice-hearing. There is evidence to show that individuals with insecure-avoidant attachment report fewer psychiatric symptoms (e.g. hallucinations, delusions and quality of life) compared to individuals with secure and insecure-anxious attachment patterns (Dozier & Lee, 1995). However, interviewers in the Dozier and Lee (1995) study observed and rated individuals with insecure-avoidant attachment as experiencing higher levels of symptoms than secure and insecure-anxious attachment patterns, highlighting a discrepancy in self and observer reports. The sample size recruited in this study was relatively modest and the number of participants limited the power of the study. Additionally, multiple analyses of the data may have increased the chance of a type I error, although, bootstrapping was used within the mediation analysis in a bid to control for multiple tests. Furthermore, although participants were recruited across the

psychosis-spectrum (acute and community-based clients) allowing generalizability of findings across a broad clinical sample, it is possible that there may be selection bias within the sample as clinicians put forward the names of eligible participants. In addition, the current sample was biased in terms of gender as there were 44 male and 11 female participants and it is acknowledged that these differences may have impacted upon the results. One systematic review has shown a number of gender differences in the experience of trauma and subsequent experience of distress; for example in comparison to men, women are more likely to appraise events as stressful, have less perceived control, higher reliance on blaming others and report a lack of available alternative coping strategies (Olff et al., 2007). Furthermore, one study investigating gender differences in a psychosis sample an association was found between severe childhood physical/sexual abuse with psychosis symptoms in women but not in men (Fisher et al., 2009). Additionally, attachment patterns themselves may have biased the sample as there is evidence to show that individuals with an insecure-avoidant attachment style are less likely to engage with mental health services in general (Gumley et al., 2014). Therefore, individuals with insecure-anxious attachments may have agreed to participate, due to a wish to please others, whereas individuals with insecure-avoidant attachments may have been reluctant to participate due to the interpersonal nature of the interview. Finally, the indirect effect regarding the relationship between trauma and voice-related severity and distress is likely to be multifaceted and involve a range of variables that have not been studied here, such as dissociation (e.g. Varese, Barkus & Bentall, 2012; Longden et al, 2012). Notwithstanding these issues, this is the first study that has collectively examined a range of measures, including trauma, attachment and key elements of the cognitive model of voice-hearing, including power and social rank.

4.2 Future research

Future research should involve larger sample sizes and employ a range of sampling methods, including recruitment over the internet and within NHS (National Health Service) settings, which may allow for greater generalizability of the findings. The opportunity for participants to independently complete the measures may encourage individuals with insecure-avoidant attachment patterns to participate, and all participants may feel more comfortable in disclosing traumatic life events. Due to the possibility that individuals with insecure-avoidant attachment may under-report their experiences of distress, an informant-rated attachment scale is also recommended. Measures of insecure-disorganised attachment should also be incorporated, as well as measures of dissociation. Finally, longitudinal studies should be

carried out in order to look at the direction and causation of the role early attachment experiences have on dimensions of voice-hearing.

4.3 Implications

Preliminary support has been found regarding the role of insecure-anxious attachment as one possible mechanism that underlies the relationship between trauma and voice-hearing. These findings warrant further investigation and highlight the importance of including attachment theory in therapeutic work with voice-hearers with a diagnosis of psychosis. The high prevalence of trauma (indicated by CTQ mean scores) reported in the current study lends support to the importance of directly asking about traumatic experiences when working with individuals with a diagnosis of psychosis (Read, 2006). The current findings also reflect the importance of enquiring about the quality of early attachment relationships among voice-hearers with a diagnosis of psychosis. Finally, professionals should be mindful about the impact attachment patterns may have on voice-related severity and distress, appraisals of voices and relationships with voices and should consider using attachment theory to inform formulations and interventions.

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Critical evaluation and reflection

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1. Introduction

A recent national audit of schizophrenia (NAS; Royal College of Psychiatrists, 2012) outlined that approximately 220,000 individuals across England and Wales have a diagnosis of schizophrenia and this diagnosis accounts for approximately 30% of adult mental health and social care monetary budgets. The audit highlights that symptoms related to schizophrenia severely restrict individual's lives and functioning and the diagnosis is often associated with premature mortality. However, it has been argued that the validity of psychiatric diagnoses holds little meaning and is overly general, given the wide range of variation amongst individuals (Bentall, 2004). Although voice-hearing is a symptom that is often associated with psychosis (Mccarthy-Jones, 2012), it is not unique to the diagnosis; evidence has shown that it is a relatively common experience in the general population (e.g. Beavan, Read & Cartwright, 2011). Therefore, Bentall (2003) argues that in order to research the processes underlying psychosis, researchers need to consider each symptom in isolation.

The National Institute for Health and Care Excellence (NICE; 2009) guidelines for schizophrenia recommends evidenced-based psychological interventions such as CBT and family interventions, although it has been acknowledged that outcomes vary greatly from individual to individual (NAS; Royal College of Psychiatrists, 2012). The cognitive model of voices is arguably the most well-developed and researched model of voice-hearing. However, trials do not consistently report significant improvements in voice-related distress post-intervention (Mawson, Cohen, & Berry, 2010). Ongoing research within the area is required in order to develop our understanding of the mechanisms underlying the development and maintenance of voices. This research should be carried out with a view to developing improved treatments for psychosis and voice-hearing and ultimately to apply this evidence to clinical practice (Schizophrenia Commission, 2012).

Consequently, the aim of this thesis was to build on current research into possible mechanisms underlying voice development and maintenance. It has been hypothesised that concepts of attachment and dissociation may underlie the development of voices and once voices develop, may maintain them (e.g. Longden, Madill, & Waterman, 2012). The current thesis provides a systematic review and meta-analysis regarding the relationship between dissociation and voices (Paper 1) and presents an investigation into whether attachment

mediates the relationship between trauma and voice-hearing in psychosis (Paper 2). It is argued that these two papers will make a significant contribution to this area of research, with implications for theory, clinical practice and future research. The aim of the present critical reflection is to consider the strengths and weaknesses of the two papers that have been presented within the current thesis. With this in mind, methodological considerations, reflections on the research process and directions for theory, clinical practice and future research will be discussed.

2. Systematic review and meta-analysis (Paper 1)

Within the psychosis and voice-hearing literature, dissociation has become increasingly considered and researched, and has been proposed as a possible mechanism underlying voice-hearing (e.g. Moskowitz, 2011). As there appeared to be increasing research in the area, with a range of different samples/populations being investigated using a range of different measures, it seemed an important area for systematic evaluation. The review aimed to systematically investigate the relationship between voice-hearing and dissociation whilst evaluating the quality of evidence regarding this relationship. In addition, the review aimed to use meta-analytic methods in order to assess the magnitude of the reported relationship between voice-hearing and dissociation across identified studies.

As this was the first review investigating dissociation and voices, in terms of inclusion criteria it was decided to be over-inclusive rather than under-inclusive. This could be considered a strength as the results could be generalised across a wide range of clinical and non-clinical samples, child and adult populations and diagnostic groups. Indeed, the demographic data showed that a large range of participants were studied. However, due to the over-inclusive nature of studies included in the review, there are several differences between the included studies; for example, within participant groups (i.e. culture, age), outcome measures and methodologies used. Consequently, these differences make it difficult to make conclusions about specific groups of participants (i.e. diagnoses, age). Therefore, conclusions were made in a broad sense as the review highlighted that the experience of voice-hearing and dissociation appear to be associated regardless of demographic characteristics and diagnosis.

2.1 Quality assessment tool

The aim of using a quality assessment tool was to use it to guide critical evaluation of the quality of the included studies. However, having reviewed the literature in this area, the identification of an appropriate quality assessment tool proved challenging. There appeared to be no published assessment tools that were designed to review cross-sectional studies. The majority of quality assessment tools seemed to be designed with a view to evaluating intervention studies alone. However, these tools often put a lot of emphasis upon the

reporting of follow-up data, intention to treat analysis and random allocation to intervention groups. Therefore, as the majority of studies identified in the review were cross-sectional in nature, these domains seemed inappropriate to consider. Furthermore, there appeared to be very little consensus or recommendations from within the field, with the exception of a review by Deeks and colleagues (2003), who identified and evaluated almost 200 tools of which six tools were recommended. Consequently, it was decided through discussion in supervisory meetings that the Effective Public Health Practice Project tool (EPHPP; Thomas, 2003) would best fit the aims of the present systematic review due to the evaluation of a variety of intervention designs and because of its clear scoring guidance.

It is acknowledged that the use of a quality assessment tool is limited as they are subjective in nature. The Cochrane Collaboration (2009) argues that quality rating tools are associated with biased ratings and often have poor inter-rater reliability. Research has also shown poor agreement between the EPHPP and other quality assessment tools such as the Cochrane Collaboration Risk of Bias tool (Armijo-Olivio, Stiles, Hagen, Biondo & Cummings 2010). With the potential for bias in mind, two methods were developed in order to control for this. Firstly, all quality assessments were monitored through regular supervision meetings where queries and discrepancies in ratings were discussed and resolved. Secondly, a proportion of these studies were rated and agreed upon by a reviewer independent to the study in order to ensure agreement. As the independent reviewer was unfamiliar with the current area of research a shared understanding of the EPHPP dictionary was developed before independent rating commenced. In particular, a list of potential confounds was established to ensure reliability in rating. This method of rating appeared comprehensive as high levels of agreement were found (90%) and these minor disagreements were discussed and resolved without difficulty. It is hoped that this process improved the possible bias in using the EPHPP tool, and could be considered a strength of the systematic review.

2.2 Meta-analysis

Meta-analysis has been described as a statistical tool used for estimating the mean and variance of underlying population effects from a collection of empirical studies addressing a similar research question (Field & Gillett, 2010). It was hypothesised that completing a meta-

analysis would add an extra dimension to the review, in terms of consideration of statistical analysis, which could not be gained by qualitative review alone. However, there are criticisms of the meta-analytic method in that there is a risk it can be viewed in a reductionist manner. Bailer (1997) argues that reducing a range of studies down to one number ignores the variance within those studies and may lead to the wrong conclusions. However, this view is argued to be a misinterpretation of meta-analysis, as the aim of the approach is to synthesise effect sizes and consider heterogeneity in effect sizes rather than merely report a summary effect (Borenstein, Hedges, Higgins & Rothstein, 2009).

However, the results of the meta-analysis do need to be interpreted with caution, as the number of studies included ($k=19$) was small, which increases the risk of producing a type I error (i.e. a false positive, where there appears to be a difference when there is not). Therefore, as mentioned in paper one, Hedges' method was employed as Field (2003) recommends using this method in cases of 20-40 studies due to it having improved control over type I errors when compared to other methods. In addition, the random-effect model of meta-analysis was chosen in comparison to the fixed-effect model. This was due to the lack of restrictions placed on the search, in terms of including varied samples of participants (e.g. child and adult) and populations (e.g. non-clinical and clinical). Consequently, the numbers of covariates between the studies were likely to be higher than if a narrow population had been selected and these potential covariates were likely to impact upon the effect sizes. Through the use of the random-effect model, the statistical programme (CMA; Comprehensive Meta-Analysis) allowed for this variation as it assumes that the true effect can vary from study to study. Having carried out initial analysis, the results were then synthesised beyond that of one number/effect size, with the aim of further understanding the findings.

2.3 Consideration of potential sources of bias (heterogeneity, publication and sensitivity analyses)

The matter of publication bias is clear in both the systematic narrative review and the meta-analysis. Rosenthal (1979) defined this as 'the file draw' phenomenon as positive findings are more likely to be published than null findings, yet both are important when reviewing research. The effect of publication bias is that the review is more likely to over-estimate the

true effect size (Field, 2003). It is acknowledged that contacting experts in the field for unpublished studies, as recommended by Field and Gillett (2010), may have improved the risk of bias. In addition, the grey literature could have been searched (Auger, 1989). However, an inclusion criterion regarding peer reviewed studies was included to ensure quality control. Furthermore, studies that were not written in English were also excluded, due to resource limitations. Consequently, the literature review as a whole may have overlooked relevant research in the field. As mentioned above, the result of publication bias on meta-analytic results is that effect sizes may become inflated. The CMA statistical programme allows for investigation in to this problem and results indicated that publication bias may not have substantially affected the overall summary effect.

Due to the early stage of research in this area, a wide range of studies was included in the review with little restrictions placed on demographic data. It is thought that the high level of heterogeneity or inconsistency across the effect sizes reflects the inclusion of a wide range of studies. A common criticism of meta-analysis is that the approach combines a wide range of different studies. This approach has been described as including “apples and oranges,” in the same analysis and has been criticised for ignoring potentially important differences across studies (in Borenstein et al., 2009). Although it is inevitable that studies within meta-analysis will differ in terms of characteristics, these differences can be assessed formally. Furthermore, the advantage of including a wide range of studies is that it allows for greater generalisation of the results across studies (Borenstein et al., 2009). In a bid to explain some of the inconsistency in effects between studies included in the meta-analysis, subgroup, publication and sensitivity analyses were carried out. However, these analyses showed no observable differences in effect sizes. It is recognised that additional subgroup analysis could have been further investigated in terms of considering different levels of methodological quality. However, as there were relatively small numbers of studies available for meta-analysis and the majority of studies did not appear to vary greatly in terms of methodological quality (i.e. 90% of studies were rated with the weak range on the EPHPP) further subgroup analysis was thought to be inappropriate.

3. Empirical research (Paper 2)

Within the psychosis and voice-hearing research field, Bowlby's (1969) attachment theory has become increasingly considered and researched. It has been proposed that attachment theory might help to develop our understanding of distressing voices (Berry, Barrowclough & Wearden, 2007) and has been proposed as a possible underlying mechanism within voice-hearing (Longden et al., 2012). A recent review identified 21 studies within the area of attachment and psychosis concluded that attachment theory may be a useful means of understanding the developmental and interpersonal nature of recovery with the context of psychosis, although further research is recommended (Gumley, Taylor, Schwannauer, & MacBeth, 2014). The current research aimed to investigate the associations between trauma, attachment patterns and voice-hearing dimensions, such as voice-related severity and distress, beliefs about voices and relationships with voices. Additionally, the current study investigated insecure-attachment as a potential mediating variable within the well-established relationship between trauma and voices.

3.1 Questionnaire measures

It might be argued that a strength of the current research is the inclusion of measures which reflect key components of the cognitive model. An advantage of using self-report measures is that they are easy to administer to a range of individuals without the risk of overburdening. However, there are also limitations with using a number of questionnaires; self-report measures could be viewed as a blunt or crude method which may overlook rich and detailed information.

The attachment measure identified for use within this study was the Psychosis Attachment Measure (PAM; Berry, Barrowclough & Wearden, 2008). The advantage of using this measure was that it is the only attachment measure validated for use with individuals with psychosis. Additionally, the measure asks participants to consider all important others in their lives, rather than purely romantic relationships. This was considered to be particularly important because evidence has shown that individuals with a diagnosis of psychosis often have limited social networks (Harley, Boardman & Craig, 2012). On the other hand, a potential disadvantage is that the PAM only measures insecure-anxious and insecure-avoidant

attachment patterns. It may have been helpful to have measured secure attachment, which has been defined as an individual developing high self-worth, believing that others are responsive and consequently, feeling comfortable with both intimacy and autonomy in relationships with others (Bartholomew & Horowitz, 1991). In addition, it may have been helpful to measure insecure-disorganised attachment, which was proposed by Main and Solomon (1990) and hypothesised to develop when an infant experiences the attachment figure as frightening, frightened, or dissociated. Bartholomew & Horowitz (1991) propose that individuals with a insecure-disorganised pattern of relating to others hold a negative self-view, lack trust in others, are apprehensive about close relationships and experience high levels of distress. In addition, the PAM is a self-report measure and the attachment system itself could bias the results. For example, it has been proposed that individuals with an insecure-avoidant pattern of relating have a tendency to self-report their attachment as autonomously secure (Gumley et al., 2014).

An alternative measure, such as the Adult Attachment Interview (AAI; Main Kaplan & Cassidy, 1985), may have been a more thorough tool to use as it uses a semi-structured interview to measure unconscious representations of attachment. The interview is transcribed and rated in terms of attachment categories or dimensions. This is a different way to conceptualise attachment, as the AAI is based on a narrative approach to attachment and is conceptualised in terms of secure, dismissing (considered to overlap with avoidant), preoccupied (considered to overlap with anxious) and unresolved (considered to mirror disorganised attachment) patterns. Although the AAI is considered the gold standard measure of attachment and has been found to be reliable within psychosis populations (MacBeth, Gumley, Schwannauer & Fisher, 2010), it was not chosen due to the time-consuming nature and potential burden to participants as a considerable number of voice-related questionnaires were also being administered. Therefore, due to acceptable levels of internal consistency demonstrated across a range of studies (Gumley et al., 2014) as well as consistency in results across these studies, the PAM was considered an appropriate alternative.

It has been argued that self-report measures of attachment, such as the PAM, are superficial and do not correlate well with the AAI (Roisman et al., 2007). Therefore, using the AAI could have produced different results within the current study. However, narrative and self-

report approaches to measuring attachment are similar in that working models of attachment are perceived as having developed as a result of earlier interpersonal experiences influencing psychosocial functioning in adulthood. Additionally, in a recent review of the psychosis and attachment literature, good consistency in terms of construct validity was found across studies and measures (e.g. measures of engagement, hospitalisation, interpersonal problems and trauma; Gumley et al., 2014).

In terms of the non-attachment measures included in the study, the majority of the measures administered required participants to reflect on their relationship with their most dominant voice (e.g. Beliefs about Voices Questionnaire-Revised, BAVQ-R; Chadwick, Lees & Birchwood, 2000; The Voice and You, VAY; Hayward, Denney, Vaughan, & Fowler, 2008). Thus, the questionnaires may have missed potentially important information about less dominant but nevertheless significant voices. Additionally, evidence has shown that both children and adults have multiple attachment figures and different ways of relating in different relationships (Doherty & Feeney, 2004). Consequently, it could be hypothesised that individuals who hear more than one voice may have different ways of relating with each of their voices. In terms of data collection, early in the interview individuals were asked to briefly describe the voices they heard. Later in the interview specific measures were administered (e.g. BAVQ-R & VAY) whereby individuals were asked to identify their most dominant voice. At a subjective level, a pattern emerged where individuals seemed to consider the voice they interpreted as the most negative or powerful or dominant, even if they heard that voice less frequently than voices they perceived as benevolent or with ambivalence. Consequently, the question of dominance may be subjective and it is possible that non-clinical voice-hearers would have chosen to reflect upon more benevolent voices.

3.2 Confounding variables

A potential weakness of the study could be that no measures of paranoia were included. One previous study found that, in a non-clinical sample, the relationship between insecure-attachment and voices did not remain significant when controlling for paranoia (Pickering, Simpson & Bentall, 2008). A recent review has also found that insecure-avoidant attachment is associated with positive and negative symptoms, paranoia and delusions (Gumley et al., 2014). In retrospect, due to the co-morbidity between voices and paranoia within psychosis

samples, measures of paranoia, negative symptoms and delusions would have been advisable in order to measure possible confounding factors.

3.3 Data collection methods

A potential strength of the data collection was that the researcher guided the participants through the measures. It is proposed that this guidance gave an opportunity to those participants who were less literate or motivated to take part in the study, as the researcher gave individuals the option of having the questions read aloud. The language used within the questionnaires was somewhat academic or advanced and frequently led to questions regarding word definitions. Additionally, double negatively phrased items often confused participants and responses were regularly discussed with the researcher. Therefore, it was hoped that with this guidance the data gathered was as accurate as was possible. On the other hand, a potential limitation may have been that participants did not complete questionnaires independently. Therefore, completing the questionnaires with another individual could have led to possible non-disclosure of information. Furthermore, participants were not randomly selected and were either referred by their key worker or self-selected through the hearing voices network (HVN). The feedback gathered from the majority of participants was that they had agreed to participate in the study due to a wish to contribute to research in a bid to help others in a similar situation to their own. However, it was considered that this wish to please others may have led to demand characteristics and participants may have changed their responses in order to fit with what they interpreted as the correct answers. Additionally, it is possible that there may be a bias of individuals with an insecure-anxious attachment style of relating (i.e. a wish to please others) within the sample. Evidence has shown that individuals with an insecure-avoidant attachment style are less likely to engage with mental health services (Gumley et al., 2014) and may therefore have been reluctant to take part in the research.

A further weakness in data collection may have been that information including diagnosis, trauma and relationships was not corroborated by clinicians or close family members/ friends. Indeed, retrospective self-report measures used in psychosis samples have been criticised because this clinical group are thought to have memory impairments due to current symptoms

(e.g. Bendall, Jackson, Hulbert & McGorry, 2008). Furthermore, research has shown that self-report measures of insecure-attachment do not always correlate with informant measures of insecure-attachment. For example, Arbuckle, Berry, Taylor, and Kennedy (2012) reported null results between self-reported insecure attachment and severity/distress regarding voice-hearing, yet a positive correlation was found between key-worker informant measures of insecure-avoidant attachment and voice-hearing. The informant version of the PAM could have been considered with a view to verifying self-reported attachment patterns. However, some participants had been discharged from services or did not report close trusting relationships and, as such, the application of this measure may have been challenging. In addition, further research with individuals with a diagnosis of psychosis has indicated that reports of child abuse has good validity in comparison to case notes and good test re-test reliability over time (Fisher et al., 2011). In light of these issues, the data collected in this study is thought to be an accurate reflection of participants' experiences.

Due to time pressures and difficulties in recruiting participants with a diagnosis of psychosis, the sample size recruited was relatively small (see section 3.4). The small sample size may limit the power of the data in order to detect differences within the results. In terms of external validity the small sample size limits the extent to which the results can be generalized or extended to others. However, the strength of recruiting a clinical sample was that the findings may be tentatively generalised for use within a clinical population. In addition, with the aim of being as inclusive as possible, participants were recruited from a variety of sources, such as acute and rehabilitation wards. Furthermore, home visits were offered to those individuals living in the community or within supported accommodation. Consequently, a range of participants were recruited, from those who were acutely unwell through to those that were considered to be functioning well enough to be discharged from mental health services. Although efforts were made to recruit from HVN to engage individuals not accessing services, the majority of participants were NHS (National Health Service) clients.

3.4 Recruitment challenges

As reflected upon in paper two, the sample size recruited for the study was relatively modest. However, compared to other studies in the area and in consideration of the time implications inherent within the study, 55 participants is a considerable sample size. A number of challenges were experienced when recruiting participants. At the time of recruitment the main NHS recruitment site was undergoing significant changes in terms of community mental health and crisis teams being reconfigured, staff members work patterns being changed and high levels of staff shortages and stress were subjectively reported. In addition, higher numbers of referrals and longer waiting lists were understandably having an impact on staff morale and engagement with the project as clinicians reportedly struggled to meet these demands. Consequently, a substantial amount of effort was required in recruitment regarding the main NHS site; regular attendance at meetings and a number of consistently timed follow-up emails and telephone calls were essential. Contact was made with additional NHS recruitment sites, HVN and other voluntary services, which did not appear to be experiencing such high levels of stress and demand. Indeed, an assertive approach was required throughout recruitment. The development of a pro-active approach was regularly reflected on during supervision meetings in terms of striking a balance between being too forceful versus too passive and ineffectual. Despite the current difficulties experienced by NHS and voluntary services in the current climate, the majority of individuals contacted regarding the research were enthusiastic about the research topic and keen to support recruitment. It is possible that the topic regarding individual's interpersonal relationships with their voices fit with clinician's current understanding and experience of working in the field. It is likely that clinicians perceived this topic as an interesting area for research and development, which may have implications for the way in which they work interpersonally with voice-hearers. The interest in this topic area is reflected by the number of clinicians that requested dissemination of the results.

Further challenges to recruitment were concerns raised by clinicians in terms of their client being too unwell or vulnerable to relapse. This was most often regarding the trauma measures and a number of potential participants that had been initially identified were later not approached by key workers, reportedly for fear of triggering past trauma memories. At these times the distress protocol and the nature of the trauma questionnaires were explained.

However, these clarifications rarely prompted a reverse decision by clinicians and individual autonomy may have been undermined as their clients were not provided with an opportunity to make an informed decision. Indeed, qualitative research has shown that clinicians primarily perceive themselves as carers to their clients and wish to protect them from stress, perceiving them as too psychologically fragile to deal with the consequences of taking part (Howard, de Salis, Tomlin, Thornicroft & Donovan, 2009). The result of these well-meaning clinicians is that clients are not given the opportunity to make an informed decision, weighing up the pros and cons regarding whether they would like to participate in research. Consequently, these challenges in recruitment may have led to biased representation of voice-hearers with a diagnosis of psychosis and may limit the generalizability of the results to the broader population.

The majority of participants who volunteered to take part in the research were seen at home. There were suggestions from clinicians that individuals with a diagnosis of psychosis may not engage with the research, they may not answer their door or may have forgotten and not be at home when called upon. In contrast to this view, once an appointment was made, all participants were at home when called upon. This finding challenges the assumption that individuals with psychosis may choose not to engage in research. Indeed, clinicians have been described as “gatekeepers” to research and a number of barriers have been outlined in recruiting to mental health research (Borschmann, Patterson, Poovendran, Wilson & Weaver, 2014). These barriers include an absence of research culture within NHS settings, clinicians not considering the relevance of research to their daily work and clinicians feeling ambivalent or intimidated by research. Moreover, the high demands experienced by clinicians in their daily work results in clinicians not prioritising research and perceiving recruitment as extra work when they already feel pressured.

3.5 Personal reflections upon the research process

As paper two was being written up for inclusion within the current thesis, a study by Robson and Mason (2014) was published. Upon reviewing the paper, although the aims of this study were different to the current study, it became clear that very similar measures of voice dimensions were used. At first, it felt challenging to integrate these findings into the write up when the focus of the two studies had been different. However, upon integration, it soon

became clear that including Robson and Mason's results and replicating them, built on their findings and allowed for further conclusions to be made.

Throughout the data collection process, the researcher reflected upon the difference between the researcher and clinician role both personally and within supervision meetings. The majority of the teaching and training within the Clinical Psychology Doctorate is from a clinical perspective. Therefore, having a background in this approach meant it was difficult to hear individual's trauma narratives and not follow this up. Additionally, from a human perspective, it was inevitable that personal feelings and reactions to traumatic experiences would be brought up. These feelings were reflected on and processed through personal reflection and during supervision meetings. As the questionnaires used in the study addressed potentially sensitive topics regarding trauma and distress levels, the researcher was concerned about striking a balance between offering empathy and comfort as well as trying to remain impartial in order to keep the answers unbiased. At times, participants wanted to share more of their history than the questionnaires required. At these times, the researcher was mindful that this was a one-off meeting and again, needed to strike the balance between building a relationship in which the client would be comfortable in disclosing personal information as well as not leaving the client distressed at the end of the meeting. In line with ethical recommendations, distress and safeguarding protocols were developed for use within the study. However, these protocols were not required to be implemented throughout the study.

Upon subjective feedback from participants, they often reported that they appreciated having some protected time in which to share their experiences with an interested other. One participant with a difficult trauma history reported to a colleague that they had found the process of data collection therapeutic. These comments lead to reflections regarding one-off meetings being a potential intervention in itself; however, on the other hand, a researcher who is not attuned to the difficulties faced by the participant could be detrimental. There is a risk that participants may be left feeling not listened to or understood, possibly stirring up unmanageable feelings regarding anger, rejection or abandonment. These feelings may reflect experiences of past interpersonal relationships and reinforce negative beliefs about others being untrustworthy and potentially harmful to one's sense of self. Therefore, it seems clear that the importance of interpersonal relating (i.e. attachment theory) even within a relatively

short meeting is fundamental. It could be argued that the process of being listened to by an understanding other mirrors 'good enough' parenting and subsequently develops 'good enough' attachment. Another individual who has the potential to listen attentively to distress, hold or contain the distress by offering helpful reflections may help an individual manage these difficult feelings. The importance of creating a therapeutic secure base cannot be overlooked.

Finally, as a whole, the research topic area documented within paper one was initially unfamiliar. Therefore, it was daunting to begin the research journey and it felt anxiety provoking and somewhat intimidating. As a consequence, a great deal of time and effort was placed into developing an understanding of the research topic area and the methods used. It is hoped that the time and effort put into this research is reflected in the considerable number of individuals recruited from a specialised group, given the number of challenges that have been faced, as well as the complex analysis that was carried out. Upon reflection, this journey has been challenging yet extremely rewarding.

4. Implications for theory, practice and future research

As directions for theory, practice and future research have been put forward throughout the discussion sections in paper one and two it is not the aim to repeat these points here. However, a brief summary of these implications will be built upon and presented below.

4.1 Implications for theory

In terms of theory, the importance of considering experiences of trauma in theories regarding voice-hearing was highlighted within both studies. Furthermore, both dissociation and attachment patterns were associated with voice-hearing. In the current thesis, both studies found that dissociation and insecure-anxious attachment might mediate the relationship between trauma and voice-hearing. However, the conclusions in both studies state that the current results should be interpreted with caution, given that research in these areas is at a relatively early stage. Therefore, caution must be taken in not over-estimating these initial results. Nevertheless, we might consider that insecure-attachment, dissociation and voice-hearing may all be linked in some way, which may have implications for current models of voice-hearing (e.g. Morrison, 2001).

4.2 Suggestions for further research

As the research into voices, dissociation and attachment is in its infancy, suggestions for future research within paper one and two were fairly extensive (given the word limit). The main recommendations for future research are that longitudinal studies are carried out with larger sample sizes, utilising a number of different recruitment strategies (e.g. NHS, voluntary services, online sources) using pure measures of voices and breaking dissociative experiences down into different types, rather than grouping the experiences together. This future research should be carried out with a view to more precisely exploring the underlying mechanisms or aetiology of the voice-hearing experience.

4.3 Implications for clinical practice

Papers one and two both consider voice-hearing within psychosis and other clinical and non-clinical samples. As mentioned in both papers, the importance of carrying out a thorough assessment regarding trauma and early life experiences was emphasised. Furthermore, the impact of trauma exposure may be linked to dissociative experiences and attachment patterns. Both dissociative experiences and attachment patterns should inform idiosyncratic

formulations regarding the development and maintenance of voice-related severity and distress, beliefs about voices and relationships with voices.

In terms of intervention, early intervention regarding dissociation was recommended. Furthermore, building on the results from paper two, the consideration of attachment patterns within assessment and formulation may guide interventions and the development of the therapeutic relationship. A growing body of research provides evidence that attachment security can increase during therapy (Taylor, Rietzschel, Danquah, & Berry, 2014). Therefore, it could be hypothesised that improvement in interpersonal relating within the therapeutic relationship may be internalised and used with others and within the relationship with the voice. Furthermore, Hayward, Overton, Doney and Denney (2009) have developed Relating Therapy for use with individuals who hear voices, with promising results. Relating Therapy aims to modify distressing relationships with voices through considering the interpersonal nature of the voice-hearing relationship and emphasising the acceptance of the voice-hearing experience through assertive engagement (Hayward et al., 2009).

5. Conclusion

The current critical evaluation has appraised the research presented within the thesis. It has outlined the strengths and weakness of the research carried out and considered how it might have been improved upon. As the research area that has been considered within the current thesis was initially unfamiliar, the process of conducting this research has felt challenging at times. Therefore, regular supervision combined with personal reflection has been an essential part of the process and has allowed ongoing development of skills and knowledge within research. Overall, this journey has been very rewarding and has enabled the completion of, what is hoped to be, an important and valuable contribution to the research area.

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Appendix A: Instructions to authors: Clinical Psychology Review



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DESCRIPTION

Clinical Psychology Review publishes substantive reviews of topics germane to **clinical psychology**. Papers cover diverse issues including: psychopathology, psychotherapy, behavior therapy, cognition and cognitive therapies, behavioral medicine, community mental health, assessment, and child development. Papers should be cutting edge and advance the science and/or practice of clinical psychology.

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Appendix B: Instructions to authors: Schizophrenia Research

Guide for Authors

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Appendix C: NHS ethical approval

NRES Committee North West - Greater Manchester East

3rd Floor, Barlow House
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M1 3DZ

Telephone: 0161 625 7820

10 June 2013

Miss Marie Pilton, Division of Clinical Psychology
2nd Floor, Zochonis Building, Brunswick Street
University of Manchester
Manchester
M13 9PL

Dear Miss Pilton

Study title: Associations between trauma, attachment and relationships with voices.
REC reference: 13/NW/0342
IRAS project ID: 121180

Thank you for your letter of 31 May 2013, responding to the Committee's request for further information on the above research and submitting revised documentation. The further information has been considered on behalf of the Committee by the Chair.

We plan to publish your research summary wording for the above study on the NRES website, together with your contact details, unless you expressly withhold permission to do so. Publication will be no earlier than three months from the date of this favourable opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to withhold permission to publish, please contact the Co-ordinator Elaine Hutchings, nrescommittee.northwest-gmsouth@nhs.net.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Ethical review of research sites

NHS sites

The favourable opinion applies to all NHS sites 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).

Conditions of the favourable opinion

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

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

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System 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 approvals from host organisations

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).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

<i>Document</i>	<i>Version</i>	<i>Date</i>
Evidence of insurance or indemnity		11 April 2013
Investigator CV	Marie Pilton	30 January 2012
Letter from Sponsor		11 April 2013
Other: Academic Supervisor 1 CV: Sandra Bucci		18 January 2013
Other: Academic Supervisor 2 CV: Katherine Berry		20 December 2010
Other: Keyworker letter	1	26 January 2013
Interview schedule:	Short form CAV	
Participant Consent Form	2	31 May 2013
Participant Information Sheet	2	31 May 2013
Protocol	1	26 January 2013
Questionnaire: Demographic information	2	31 May 2013
Questionnaire: Beck Anxiety Inventory (BAI)		
Questionnaire: Voice Power Differential Scale (VPD)		
Questionnaire: Beliefs about Voices questionnaire (BAVQ-R)		

Questionnaire: Calgary Depression Scale		
Questionnaire: CTQ		
Questionnaire: The Voice and You (VAY)		
Questionnaire: Kiddie-Sads-Present and Lifetime version (K-SADS-PL)	1.0	31 October 1996
Questionnaire: Social Comparison Scale		
Questionnaire: PANNS		
Questionnaire: Psychotic Symptoms Rating Scale (PSYRATS)	Auditory Hallucination Subscale	
Questionnaire: PAMSR		
Questionnaire: THQ		
REC application	121180/439935/1/988	17 April 2013
Response to Request for Further Information	1	31 May 2013

Statement of compliance

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

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

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

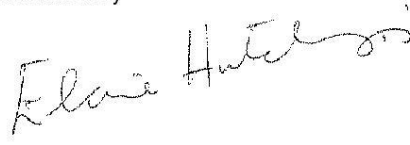
Further information is available at National Research Ethics Service website > After Review

13/NW/0342	Please quote this number on all correspondence
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We are pleased to welcome researchers and R & D staff at our NRES committee members' training days – see details at <http://www.hra.nhs.uk/hra-training/>

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

Yours sincerely



pp

Mr Francis Chan
Chair

Email: nrescommittee.northwest-gmsouth@nhs.net

Enclosures: "After ethical review – guidance for researchers"

Copy to: Catherine Barrow, University of Manchester

Damien Longson, Manchester Mental Health and Social Care Trust

Appendix D: Participant information sheet

31.05.2013 –Version 2(v2)

Marie Pilton
School of Psychological Sciences
2nd Floor
Zocohnis Building
Brunswick Street
Manchester
M13 9PL

Tel: 0161 3060400
Fax: 0161 306040

marie.pilton@postgrad.manchester.ac.uk

Participant Information Sheet (v2)

Associations between trauma, attachment relationships and voice hearing

Name of Investigator: Marie Pilton

We would like to invite you to volunteer to take part in our research study.

If you may be interested in volunteering it is important for you to understand why the research is being done and what it will involve before deciding.

Please read the following information carefully and discuss it with others if you wish. Please then decide whether you wish to take part. If there is anything that is not clear or you would like more information about please do not hesitate to ask us.

Thank you for your time.

What is the purpose of the study?

We are inviting you to volunteer for a study looking at the links between traumatic experiences, relationships with others and voice hearing. The study will look at whether experiencing traumatic events has an impact on people's relationships and their experience of hearing voices.

The results of this study will help the researchers to understand the links between the above aspects which we hope will lead to improved treatments.

The study is being completed as part of a research project with The University of Manchester.

Why have I been invited to take part?

We are approaching all patients who hear voices. Your key worker has agreed for us to approach you and thinks you may be interested in taking part in the study.

What will I have to do if I agree to take part?

We would like to recruit a total of 47 people. If you decide to take part in the study, you will be asked to take part in the following:

- To meet with a researcher to complete questionnaires about your experience of hearing voices, your relationships and any traumatic experiences you may have had. If there are any questions you would prefer not to answer that is ok, just let the researcher know.
- The questionnaires will take up to one and a half hours to complete and can be carried out in a single meeting or over several meetings. We will try our best to arrange times

to suit you. Where possible, a member of the research team will visit you at your home or in a private room within a NHS building close by.

- Whilst it will not be possible to pay travelling costs we are able to offer you a reimbursement of £5 for your time.

Will my taking part be kept confidential?

- All of the information which will be collected during the study will be strictly confidential. The only exception to this would be if you told us information that suggested that you or someone else may be harmed. In this case we have a responsibility to inform your key worker.
- With your permission, we would like to inform your key worker you have agreed to take part in the study before meeting with you.
- In accordance with the Data Protection Act of 1998, all the information you give the researcher will be kept strictly confidential. Your name will not appear on any of the forms; we will give you a study number instead.
- Some participants will be asked if the meeting could be digitally recorded, so the ratings can be checked by a second researcher. The recording will be destroyed after it has been used and your personal details will not be disclosed.
- As you are under the care of a mental health NHS Trust, a copy of your consent form will be filed in your medical records to confirm that you have given written informed consent to take part in our study. This copy may be reviewed by the NHS Trust's Clinical Audit Department. Also, responsible individuals from the University of Manchester may look at the research records to audit the way our study was carried out.

What are the possible disadvantages and risks of taking part in the study?

As far as we know, there are no disadvantages or risks in taking part in the study. The questionnaires in our study are short and simple to complete. Some of the questions do ask you about traumatic experiences but you do not have to answer any questions you do not want to and the meeting can be stopped at any time.

If at any point during your participation in the study you feel distressed, support will be made available for you. If you do feel distressed after meeting with the researcher you can contact your key worker or the researcher (at the University) on **0161 306 0400**. If you are feeling very distressed out of office hours, we suggest you go to your local crisis team on **0161 720 2045**

What are the possible benefits of taking part in the study?

The results of this study will help the researchers to understand the links between traumatic experiences, relationships with others and voice hearing. We hope that the findings will go on to improve future treatments for people who hear voices.

You will be asked if you would like feedback about the overall results. If you would like to receive feedback, the researcher will contact you once the results have been analysed. You will not be identified in any report about the study.

Do I have to take part in the study?

Taking part in the study is voluntary. If you do decide to take part you will be given this information sheet to take home and asked to sign a consent form.

However, if you would prefer not to take part you do not have to give a reason. The staff involved in your care will not be upset and your treatment will not be affected.

Also, if you decide to take part now but later change your mind, you can withdraw at any time from the study. The researchers and staff involved in your care will not be upset and your treatment will not be affected.

What do I do now?

If you are interested in taking part in this study or would like to know more about it, please complete the form at the end of this document and let your keyworker know. Your contact details will be passed to the research team and a researcher from the study will contact you as soon as possible. She will go through the information sheet with you and answer any questions you have. This should take about 10 minutes. You can let her know if you continue to be interested in taking part and arrange a meeting with her.

What do I do if something goes wrong?

If you have a concern about any aspect of this study, you should ask to speak to the researcher who will do their best to answer your questions. If they are unable to resolve your concern or you wish to make a complaint regarding the study, please contact a University Research Practice and Governance Coordinator on 0161 275 7583 or 0161 275 8093 or by email to research.complaints@manchester.ac.uk

Thank you very much for considering to volunteer for our research.

Please discuss this information with your family, friends or mental health team if you wish.

**If you are interested in taking part in our study or would to know more about it please
complete the details below.**

Contact details

Name	
Preferred contact number	
Can we leave an answerphone message? (please circle)	Yes/ No
When would you prefer to be contacted? (please circle)	Morning/ Afternoon/ Don't mind
Signature	
Date	

Please return this form to your keyworker. Your keyworker will pass it onto the researchers who will contact you as soon as possible.

Thank you very much for your interest in our study. We look forward to speaking with you soon.

Appendix E: Consent form

31.5.2013 –Version two (v2)

Marie Pilton
School of Psychological Sciences
2nd Floor
Zocohnis Building
Brunswick Street
Manchester
M13 9PL

Tel: 0161 3060400
Fax: 0161 306040

marie.pilton@postgrad.manchester.ac.uk

Consent form (v2)

Patient identification number:

**Title: Associations between trauma, attachment relationships and voice
hearing.**

Name of Investigator: Marie Pilton

Please initial the boxes

1. I confirm that I have read and understand the participant information sheet dated 31.05.2013 (version number two (v2)) 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 change my mind and withdraw at any time, without giving any reason, without my medical care or legal rights being affected. ☐

3. I understand that relevant sections of my data collected during the study may be looked at by individuals from the University of Manchester or from the NHS Trust for monitoring and audit purposes. I give permission for these individuals to have access to my records. ☐
4. I consent to my interview being digitally recorded. I understand that the recording will be stored in a secure place and listened to by the research team only. Once the recording has been listened to it will be destroyed. *(You do not have to agree to this point to take part in the study)* ☐
5. I consent to my key worker being informed about my involvement in the study. ☐
6. I would like to be informed of the results of the research study. *(You do not have to agree to this point to take part in the study)*. If you have answered yes, please provide your contact details on page three of this document. ☐
7. I agree to take part in the above study. ☐

Name of Participant _____

Signature _____ Date _____

Name of Researcher _____

Signature _____ Date _____

Providing Feedback

If you would like to be informed of the results of the research study, please provide your contact details below:

Full
name.....

Full address (including postcode)
.....
.....
.....
.....
.....
.....

Signature.....

Date.....

Please note: these details will only be used for the purpose of providing feedback. Once feedback has been provided these details will be destroyed.

Appendix F: Demographic form

31.05.2013 –Version two (v2)

Marie Pilton
School of Psychological Sciences
2nd Floor
Zocohnis Building
Brunswick Street
Manchester
M13 9PL

Tel: 0161 3060400
Fax: 0161 306040

marie.pilton@postgrad.manchester.ac.uk

Demographic Information (v2)

Patient identification number:

Date.....

**Title: Associations between trauma, attachment relationships and voice
hearing.**

Name of Investigator: Marie Pilton

Age: _____

Gender: (please circle) M F

Ethnicity: (please circle)

White

1. British
2. Any other white background (please specify)_____

Black

1. British
2. Caribbean
3. African
4. Any other black background (please specify)_____

Asian

1. British
2. Indian
3. Pakistani
4. Bangladeshi
5. Any other Asian background (please specify)_____

Chinese

1. British
2. Chinese
3. Any other Chinese background (please specify)_____

Mixed

1. White & Black Caribbean
2. White & Black African
3. White & Asian
4. White & Chinese
5. Any other mixed background (please specify)_____

Other ethnic group

1. Other ethnic group not above (please specify)_____

Occupational status: (please circle)

1. Managers and Senior Officials
2. Professional Occupations
3. Associate Professional and Technical Occupations
4. Administrative and Secretarial Occupations
5. Skilled Trades Occupations
6. Personal Service Occupations
7. Sales and Customer Service Occupations
8. Process, Plant and Machine Operatives
9. Elementary Occupations

Full-time / Part-time (please circle)

Marital Status (please circle)

1. Single
2. Cohabiting
3. Married
4. Separated/divorced
5. Widowed

Number of children: _____

Accommodation (please circle):

1. Own home
2. Rented
3. Supported flat/home
4. Live with parents
5. No fixed abode
6. Other

(please specify): _____

Years in full time education: _____

Highest educational attainment

Please specify: _____

Diagnosis:

Please specify:_____

Length of time hearing voices:

Please specify in months and years:_____

First contact with mental health services for symptoms of psychosis:

Please specify date:_____

Number of hospitalisations for difficulties related to psychosis:

Please specify:_____

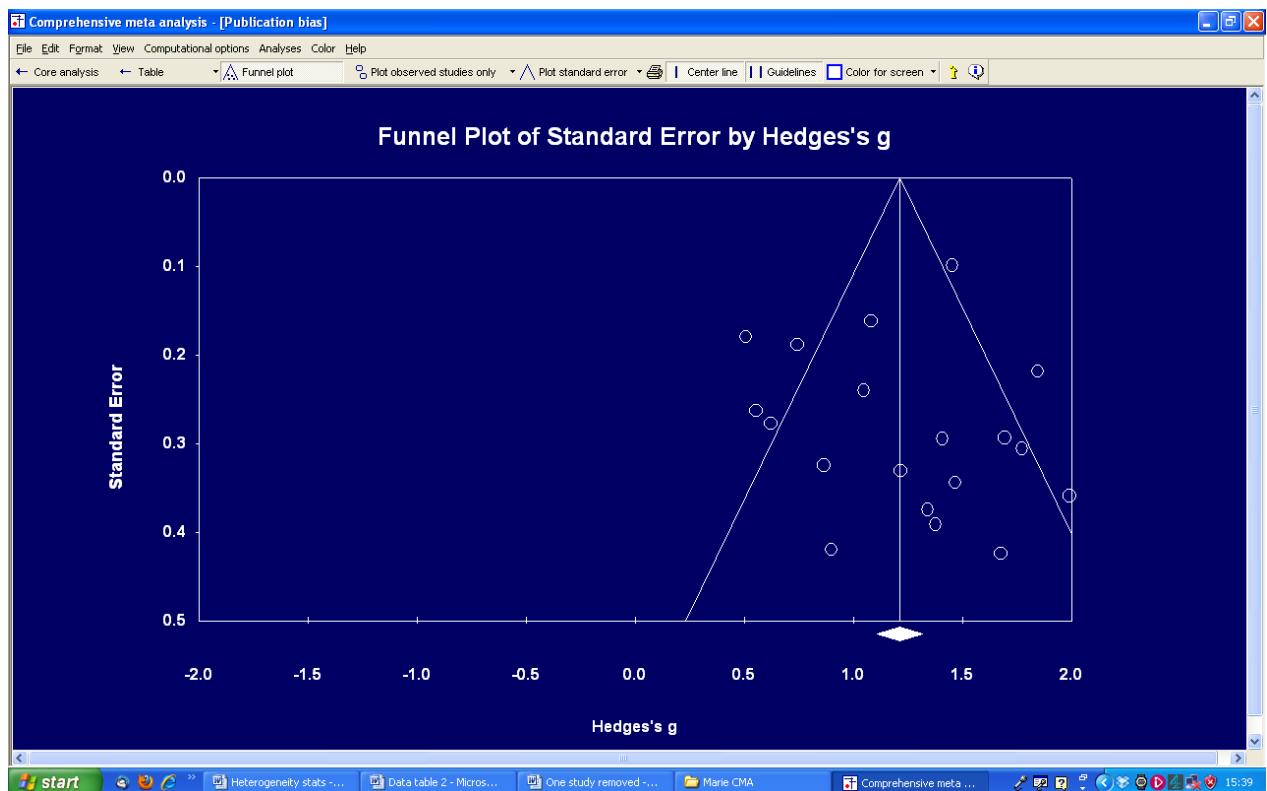
Age of onset of symptoms of psychosis:

Please specify:_____

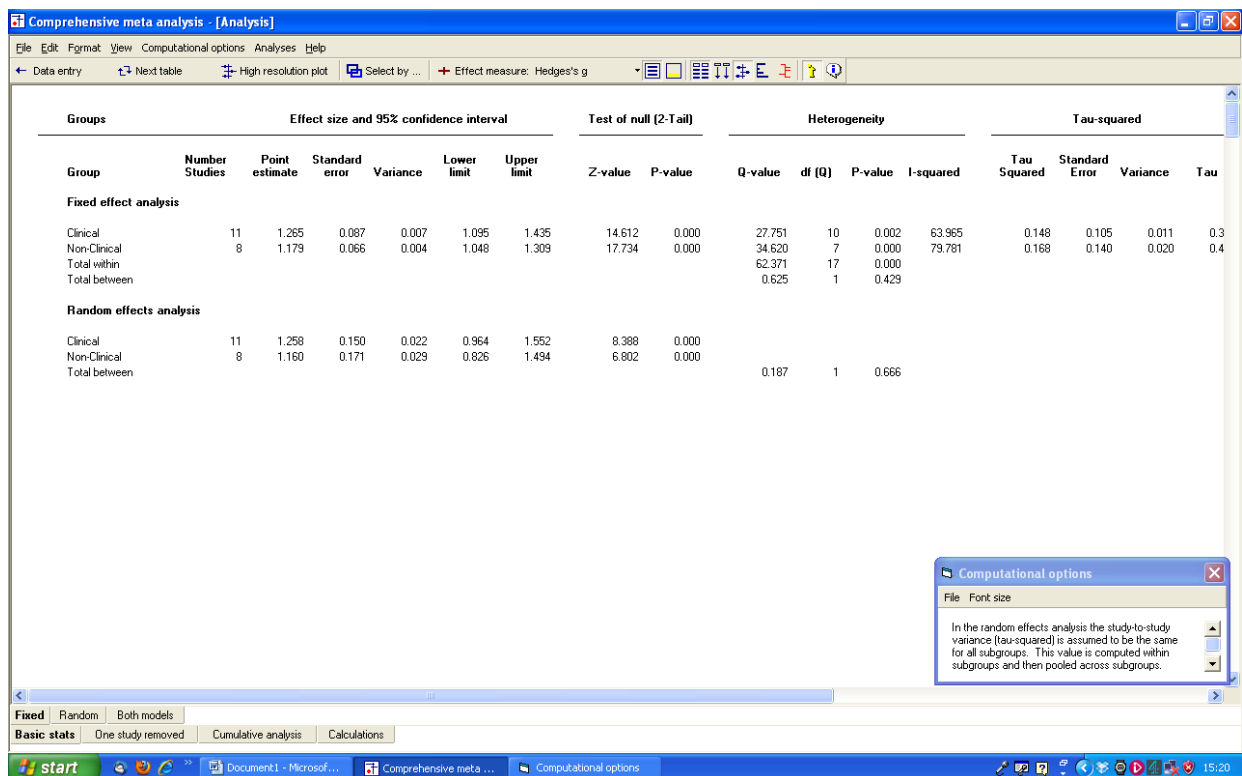
Duration of symptoms of psychosis:

Please specify:_____

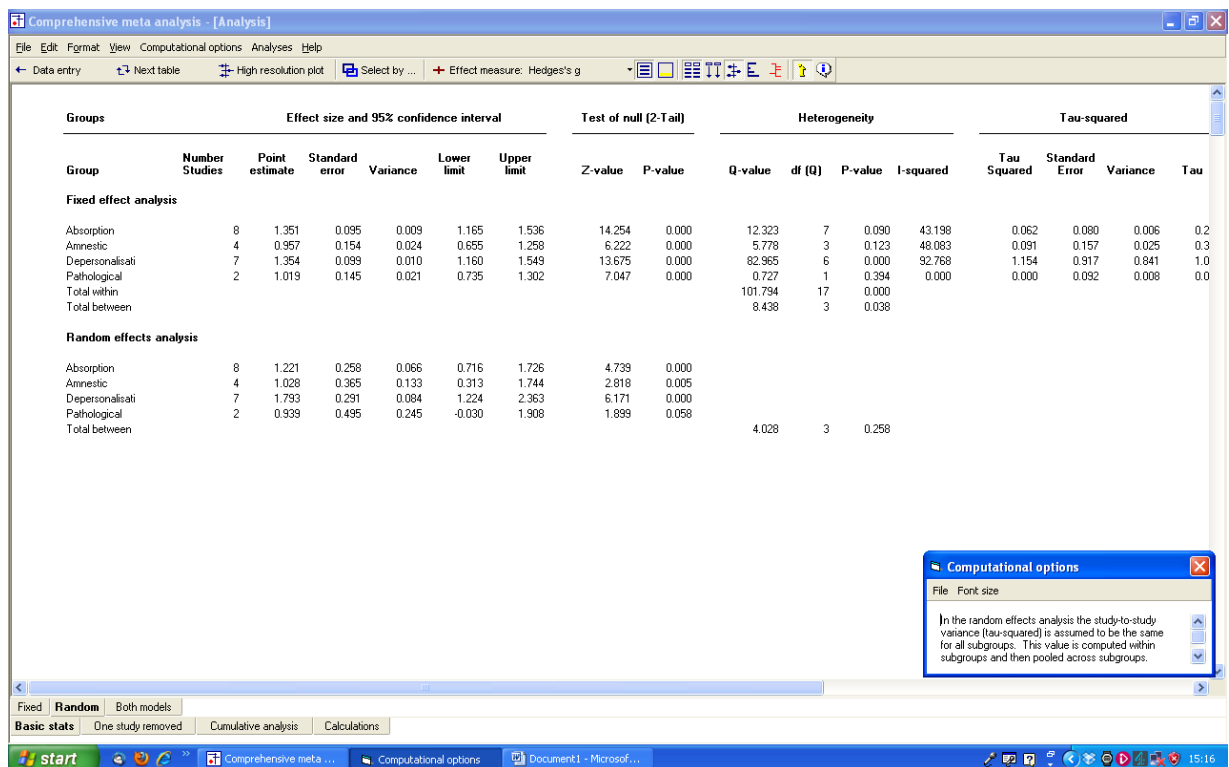
Appendix G: Funnel plot and heterogeneity analysis



Funnel plot analysis for the overall sample



Heterogeneity analysis: clinical and non-clinical subgroups



Heterogeneity analysis: dissociation subgroups

Appendix H: Psychotic Symptom Rating Scales–Auditory Hallucinations Scale

PSYCHOTIC SYMPTOM RATING SCALES:

AUDITORY HALLUCINATIONS

Haddock, G. , McCarron, J., Tarrier, N. and Faragher, E.B. (1999) Scales to measure dimensions of hallucinations and delusions: the psychotic symptom rating scales (PSYRATS). Psychological Medicine, 29, 879-889

GENERAL INSTRUCTIONS

The following structured interview is designed to elicit specific details regarding different dimensions of auditory hallucinations. When asking questions, the interview is designed to rate the patient's experiences over the last week for the majority of items. There are two exceptions to this e.g. when asking about beliefs regarding cause of voices, rate the patient's response based on what they believe at the time of the interview. Also loudness of voices should be rated according to the loudness of voices at the time of interview or the last time the patient experienced them.

Name:

Age:

Sex: M / F

Diagnosis: (if relevant)

Length of time experiencing voices (years) :

Hallucinations in other modalities: visual / olfactory / gustatory / tactile

AUDITORY HALLUCINATIONS: SCORING CRITERIA

1. FREQUENCY

How often do you experience voices? e.g. every day, all day long etc.

- 0. Voices not present or present less than once a week (specify frequency if present)
- 1. Voices occur for at least once a week
- 2. Voices occur at least once a day
- 3. Voices occur at least once an hour
- 4. Voices occur continuously or almost continuously i.e., stop for only a few seconds or minutes

2. DURATION

When you hear your voices, how long do they last, e.g. for a few seconds, minutes, hours, all day long?

- 0. Voices not present
- 1. Voices last for a few seconds, fleeting voices
- 2. Voices last for several minutes
- 3. Voices last for at least one hour
- 4. Voices last for hours at a time

3. LOCATION

When you hear your voices, where do they sound like they're coming from?

-inside your head and/or outside your head?

-if voices sound like they are outside your head, whereabouts do they sound like they are coming from?

- 0. No voices present
- 1. Voices sound like they are inside head only
- 2. Voices outside the head, but close to ears or head. Voices inside the head may also be present.
- 3. Voices sound like they are inside or close to ears and outside head away from ears
- 4. Voices sound like they are from outside the head only

4. LOUDNESS

How loud are your voices?

Are they louder than your voice, about the same loudness, quieter or just a whisper?

- 0. Voices not present
- 1. Quieter than own voice, whispers.
- 2. About same loudness as own voice
- 3. Louder than own voice
- 4. Extremely loud, shouting

5. BELIEFS RE-ORIGIN OF VOICES

What do you think has caused your voices?

-Are the voices caused by factors related to yourself or solely due to other people or factors?

If patient expresses an external origin:

- How much do you believe that your voices are caused by (add patient's contribution) on a scale from 0-100 with 100 being that you are totally convinced, have no doubts and 0 being that it is completely untrue?

0. Voices not present
1. Believes voices to be solely internally generated and related to self
2. Holds a less than 50% conviction that voices originate from external causes
3. Holds 50% or more conviction (but less than 100%) that voices originate from external causes
4. Believes voices are solely due to external causes (100% conviction)

6. AMOUNT OF NEGATIVE CONTENT OF VOICES

Do your voices say unpleasant things or negative things?

- Can you give me some examples of what the voices say? (record these examples)
- How much of the time do the voices say these types of unpleasant or negative items?

0. No unpleasant content
1. Occasional unpleasant content
2. Minority of voice content is unpleasant or negative (less than 50%)
3. Majority of voice content is unpleasant or negative (50% or more)
4. All of voice content is unpleasant or negative

7. DEGREE OF NEGATIVE CONTENT

(Rate using criteria on scale, asking patient for more detail if necessary)

0. Not unpleasant or negative
1. Some degree of negative content, but not personal comments relating to self or family e.g. swear words or comments not directed to self, e.g. "the milkman's ugly"
2. Personal verbal abuse, comments on behaviour e.g. "shouldn't do that or say that"
3. Personal verbal abuse relating to self-concept e.g. "you're lazy, ugly, mad, perverted"
4. Personal threats to self e.g. threats to harm self or family, extreme instructions or commands to harm self or others and personal verbal abuse as in (3)

8. AMOUNT OF DISTRESS

Are your voices distressing?

- How much of the time?

0. Voices not distressing at all
1. Voices occasionally distressing, majority not distressing (<10%)
2. Minority of voices distressing (<50%)
3. Majority of voices distressing, minority not distressing ($\geq 50\%$)
4. Voices always distressing

9. INTENSITY OF DISTRESS

When voices are distressing, how distressing are they?

-Do they cause you minimal, moderate, severe distress?

-Are they the most distressing they have ever been ?

0. Voices not distressing at all
1. Voices slightly distressing
2. Voices are distressing to a moderate degree
3. Voices are very distressing, although subject could feel worse
4. Voices are extremely distressing, feel the worst he/she could possibly feel

10. DISRUPTION TO LIFE CAUSED BY VOICES

How much disruption do the voices cause to your life?

-Do the voices stop you from working or other daytime activity?

-Do they interfere with your relationships with friends and/or family?

- Do they prevent you from looking after yourself, e.g. bathing, changing clothes, etc?

0. No disruption to life, able to maintain social and family relationships (if present)
1. Voices cause minimal amount of disruption to life e.g. interferes with concentration although able to maintain daytime activity and social and family relationships and be able to maintain independent living without support.
2. Voices cause moderate amount of disruption to life causing some disturbance to daytime activity and/or family or social activities. The patient is not in hospital although may live in supported accommodation or receive additional help with daily living skills.
3. Voices cause severe disruption to life so that hospitalisation is usually necessary. The patient is able to maintain some daily activities, self-care and relationships whilst in hospital. The patient may also be in supported accommodation but experiencing severe disruption of life in terms of activities, daily living skills and/or relationships.
4. Voices cause complete disruption of daily life requiring hospitalisation. The patient is unable to maintain any daily activities and social relationships. Self-care is also severely disrupted.

11. CONTROLLABILITY OF VOICES

- Do you think you have any control over when your voices happen?
- Can you dismiss or bring on your voices?

0. Subject believes they can have control over the voices and can always bring on or dismiss them at will
1. Subject believes they can have some control over the voices on the majority of occasions
2. Subject believes they can have some control over their voices approximately half of the time
3. Subject believes they can have some control over their voices but only occasionally. The majority of the time the subject experiences voices which are uncontrollable
4. Subject has no control over when the voices occur and cannot dismiss or bring them on at all.

NUMBER OF VOICES

How many different voices have you heard over the last week?

No. of voices =

FORM OF VOICES

1 st person	Yes/No	(n=	)
2 nd person	Yes/No	(n=	)
3 rd person	Yes/No	(n=	)
Single words or phrases without pronouns	Yes/No	(n=	)

Appendix I: Beliefs about Voices Questionnaire-Revised

Beliefs About Voices Questionnaire (BAVQ – R)

There are many people who hear voices. It would help us to find out how you are feeling about your voices by completing this questionnaire. Please read each statement and tick the box that best describes the way you have been feeling in the past week.

If you hear more than one voice then please complete the form for the voice that is dominant.

Thank you for your help.

Name:

Age:

	BELIEFS ABOUT VOICES	Disagree	Unsure	Slightly Agree	Strongly Agree
1	My voice is punishing me for something that I have done				
2	My voice wants to help me				
3	My voice is very powerful				
4	My voice is persecuting me for no good reason				
5	My voice wants to protect me				
6	My voice seems to know everything about me				
7	My voice is evil				
8	My voice is helping me to keep sane				
9	My voice makes me do things that I really don't want to do				
10	My voice wants to harm me				
11	My voice is helping me to develop my special powers or abilities				
12	I cannot control my voices				
13	My voice wants me to do bad things				
14	My voice is helping me to achieve my goal in life				
15	My voice will harm or kill me if I disobey or resist it				
16	My voice is trying to corrupt or destroy me				
17	I am grateful for my voice				
18	My voice rules my life				

	EMOTIONAL REACTIONS	Disagree	Unsure	Slightly Agree	Strongly Agree
19	My voice reassures me				
20	My voice frightens me				
21	My voice makes me happy				
22	My voice makes me feel down				
23	My voice makes me feel angry				
24	My voice makes me feel calm				
25	My voice makes me feel anxious				
26	My voice makes me feel confident				

When I hear my voice, usually ...

	BEHAVIOURAL REACTIONS	Disagree	Unsure	Slightly Agree	Strongly Agree
27	I tell it to leave me alone				
28	I try and take my mind off it				
29	I try and stop it				
30	I do things to prevent it talking				
31	I am reluctant to obey it				
32	I listen to it because I want to				
33	I willingly follow what my voice tells me to do				
34	I have done things to start to get in contact with my voice				
35	I seek the advice of my voice				

Appendix J: The Voice and You

The Voice and You (VAY)

**A PERSON'S ASSESSMENT OF THE RELATIONSHIP THEY HAVE WITH THEIR
PREDOMINANT VOICE**

**Mark Hayward
Psychology Department
University of Surrey
Guildford
2008**

PLEASE READ THIS BEFORE YOU START

The statements listed here are the sorts of feelings and attitudes which people sometimes have about or towards the voices they hear. Please read each statement carefully and indicate, by ticking the appropriate column, the extent to which you think it applies to you in relation to your predominant voice.

Try to be completely frank and honest about yourself. Avoid answering the way you would like to be or the way you would like others to think of you, rather than the way you really are.

Try as far as possible, to place your ticks in the “Nearly always true” and “Rarely true” columns. The two middle columns are really for if you cannot make up your mind.

Please state -

Your age:

Sex: M / F

Duration of voice hearing experience (years)

Diagnosis: (if relevant)

Are you currently taking anti-psychotic medication? Yes / No

	Nearly always true	Quite often true	Sometimes true	Rarely true
1. My voice wants things done his/her way				
2. My voice helps me make up my mind				
3. I prefer to keep my voice at a safe distance				
4. My voice makes hurtful remarks to me				
5. My voice does not let me have time to myself				
6. I have a tendency to look up to my voice				
7. When my voice gets too close to me, it makes me feel uneasy				
8. My voice constantly reminds me of my failings				
9. My voice dislikes it when I exclude him/her by showing an interest in other people				
10. I allow my voice to take control of me				
11. I feel I have little to offer my voice				
12. It is easy for my voice to change my mind				
13. My voice does not give me credit for the good things I do				

	Nearly always true	Quite often true	Sometimes true	Rarely true
14. My voice tries to accompany me when I go out				
15. I feel deserted when my voice is not around				
16. I try to hide my feelings from my voice				
17. My voice tries to get the better of me				
18. My voice dislikes spending time on his/her own				
19. My voice's judgment is better than mine				
20. I do not like to get too involved with my voice				
21. My voice makes me feel useless				
22. I need to have my voice around me a great deal				
23. I don't like my voice to know what I am thinking				
24. I have difficulty letting go of my voice				
25. My voice tries to make me out to be stupid				
26. My voice finds it hard to allow me to have time away from him/her				
27. I have a great need to talk to my voice				
28. I don't wish to spend much time listening to my voice				

Appendix K: Childhood Trauma Questionnaire



Name: _____

Age: _____ Sex: _____

Ready Score®
Answer Document

When I was growing up ...	Never True	Rarely True	Sometimes True	Often True	Very Often True
1. I didn't have enough to eat.	☐	☐	☐	☐	☐
2. I knew that there was someone to take care of me and protect me.	☐	☐	☐	☐	☐
3. People in my family called me things like "stupid," "lazy," or "ugly."	☐	☐	☐	☐	☐
4. My parents were too drunk or high to take care of the family.	☐	☐	☐	☐	☐
5. There was someone in my family who helped me feel that I was important or special.	☐	☐	☐	☐	☐
6. I had to wear dirty clothes.	☐	☐	☐	☐	☐
7. I felt loved.	☐	☐	☐	☐	☐
8. I thought that my parents wished I had never been born.	☐	☐	☐	☐	☐
9. I got hit so hard by someone in my family that I had to see a doctor or go to the hospital.	☐	☐	☐	☐	☐
10. There was nothing I wanted to change about my family.	☐	☐	☐	☐	☐
11. People in my family hit me so hard that it left me with bruises or marks.	☐	☐	☐	☐	☐
12. I was punished with a belt, a board, a cord, or some other hard object.	☐	☐	☐	☐	☐
13. People in my family looked out for each other.	☐	☐	☐	☐	☐
14. People in my family said hurtful or insulting things to me.	☐	☐	☐	☐	☐
15. I believe that I was physically abused.	☐	☐	☐	☐	☐
16. I had the perfect childhood.	☐	☐	☐	☐	☐
17. I got hit or beaten so badly that it was noticed by someone like a teacher, neighbor, or doctor.	☐	☐	☐	☐	☐
18. I felt that someone in my family hated me.	☐	☐	☐	☐	☐
19. People in my family felt close to each other.	☐	☐	☐	☐	☐
20. Someone tried to touch me in a sexual way, or tried to make me touch them.	☐	☐	☐	☐	☐
21. Someone threatened to hurt me or tell lies about me unless I did something sexual with them.	☐	☐	☐	☐	☐
22. I had the best family in the world.	☐	☐	☐	☐	☐
23. Someone tried to make me do sexual things or watch sexual things.	☐	☐	☐	☐	☐
24. Someone molested me.	☐	☐	☐	☐	☐
25. I believe that I was emotionally abused.	☐	☐	☐	☐	☐
26. There was someone to take me to the doctor if I needed it.	☐	☐	☐	☐	☐
27. I believe that I was sexually abused.	☐	☐	☐	☐	☐
28. My family was a source of strength and support.	☐	☐	☐	☐	☐

Appendix L: Psychosis Attachment Measure

SELF-REPORT MEASURE

We all differ in how we relate to other people. This questionnaire lists different thoughts, feelings and ways of behaving in relationships with others.

PART A

Thinking generally about how you relate to other key people in your life, please use a tick to show how much each statement is like you. Key people could include family members, friends, partner or mental health workers.

There are no right or wrong answers

	Not at all	A little	Quite a bit	Very much
1. I prefer not to let other people know my 'true' thoughts and feelings.	(..)	(..)	(..)	(..)
2. I find it easy to depend on other people for support with problems or difficult situations.	(..)	(..)	(..)	(..)
3. I tend to get upset, anxious or angry if other people are not there when I need them.	(..)	(..)	(..)	(..)
4. I usually discuss my problems and concerns with other people.	(..)	(..)	(..)	(..)
5. I worry that key people in my life won't be around in the future.	(..)	(..)	(..)	(..)
6. I ask other people to reassure me that they care about me.	(..)	(..)	(..)	(..)
7. If other people disapprove of something I do, I get very upset.	(..)	(..)	(..)	(..)
8. I find it difficult to accept help from other people when I have problems or difficulties.	(..)	(..)	(..)	(..)
9. It helps to turn to other people when I'm stressed.	(..)	(..)	(..)	(..)
10. I worry that if other people get to know me better, they won't like me.	(..)	(..)	(..)	(..)

	Not at all	A little	Quite a bit	Very much
11. When I'm feeling stressed, I prefer being on my own to being in the company of other people.	(..)	(..)	(..)	(..)
12. I worry a lot about my relationships with other people.	(..)	(..)	(..)	(..)
13. I try to cope with stressful situations on my own.	(..)	(..)	(..)	(..)
14. I worry that if I displease other people, they won't want to know me anymore.	(..)	(..)	(..)	(..)
15. I worry about having to cope with problems and difficult situations on my own.	(..)	(..)	(..)	(..)
16. I feel uncomfortable when other people want to get to know me better.	(..)	(..)	(..)	(..)

PART B

In answering the previous questions, what relationships were you thinking about?

(E.g. relationship with mother, father, sister, brother, husband, wife, friend, romantic partner, mental health workers etc)

Appendix M: The Social Comparison Scale

Please circle the number between each statement at the point which best fits the way which you see yourself in comparison to others at the moment.

Like this:

Small 1 2 3 4 5 6 7 8 9 10 Big

In relationship to others, I feel:

Inferior	1 2 3 4 5 6 7 8 9 10	Superior
Less competent	1 2 3 4 5 6 7 8 9 10	More competent
Less likable	1 2 3 4 5 6 7 8 9 10	More likeable
Less reserved	1 2 3 4 5 6 7 8 9 10	More reserved
Left out	1 2 3 4 5 6 7 8 9 10	Accepted
Different	1 2 3 4 5 6 7 8 9 10	Same

Thank you for your help.