Observed Relating Behaviours between Voice Hearers and Their Persecutory Voice during AVATAR Therapy Dialogue

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D.Clin. Psy thesis (Volume 1), 2017

University College London

UCL Doctorate in Clinical Psychology

Thesis declaration form

I confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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Overview

Distressing auditory verbal hallucinations (AVH) can cause suffering and significant impairment. This thesis focuses on psychological interventions for AVH and is presented in three parts.

Part I is a qualitative and quantitative review on the effects group therapy has on AVH. Twenty studies met inclusion criteria. The findings taken as a whole are mixed. There is not strong evidence to suggest that group therapy is effective in reducing AVH symptoms but there are more promising findings for group approaches in targeting AVH beliefs and distress.

Part II aimed to map relating behaviours observed between participants and their created avatars (visual representation of their persecutory voice) in the context of AVATAR therapy dialogue. A coding frame was developed to enable a fine-grained analysis of the therapy. The findings do indicate that relating behaviours between participants and avatars change over the course of therapy. The results also provide an insight into the specific therapeutic techniques delivered within AVATAR therapy dialogue.

Part III is a critical appraisal of the methodological developments presented in the empirical paper. It explores the rationale behind analysing complex psychological interventions and offers an account of the methodological, conceptual and practical issues faced when developing a coding frame.

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Acknowledgements

I would like to firstly thank my research supervisor, Dr. Miriam Fornells-Ambrojo, for all her support and guidance on this project. Her passion and expertise has truly been inspiring. Not only that but her warmth and humour has made it a most enjoyable journey.

I would also like to thank my external supervisor, Dr. Mar Rus-Calafell and the wider AVATAR team, who provided invaluable access to the trial data as-well-as ongoing advice and continued encouragement throughout this process.

This project would have of course not have been possible without the individuals who took part in the trial. I thank them for their participation and I do hope they have benefited from taking part in the study.

I would also like to thank my mum for her unwavering support over the years. This would not have been possible without you. Finally, I would like to add a special mention to Melissa-Jean who has offered nothing but continued support, compassion and understanding over this final leg. I can now begin to think about that trip to the ‘Cod’!

Part I: Literature Review

Group Therapy for Auditory Verbal Hallucinations: A Qualitative and Quantitative Review

Abstract

Aims:

Evidence for group therapy for auditory verbal hallucinations (AVH) has been mixed. This review aimed to update previous literature reviews and quantitatively evaluate the effectiveness of group therapy for AVH.

Methods:

A literature search was conducted using three literature databases. The inclusion criteria were as follows: 1) interventions were delivered in a group format; 2) papers were in English and published in peer reviewed journals; 3) at least 75% of study sample had a diagnosis of schizophrenia or schizoaffective disorder; 4) the study included at least one specific AVH quantitative outcome measure.

Results:

Twenty studies met inclusion criteria, with 15 of these defined as AVH specific. A meta-analysis of six studies produced a non-significant small pooled effect size (-0.06, 95% CI [- 0.26 – 0.14]). The qualitative review indicated more encouraging findings on the effect AVH specific groups have on reducing distress, challenging beliefs about voices and modifying certain aspects of the voice-hearer relationship.

Conclusion:

Findings from group therapies which target voice related distress are more encouraging than those which aim to reduce symptoms. However, these findings need to be replicated in larger, more methodological rigorous trials before more definitive conclusions on the effects group therapy has on AVH can be drawn.

Introduction

Auditory verbal hallucinations (AVH), also referred to as voices, occur frequently among individuals with psychosis. They are commonly associated with distress, reduced quality of life and increased risk of suicide (Shergill, Murray, & McGuire, 1998). Voices are particularly treatment resistant, with one in four people with schizophrenia failing to respond adequately to antipsychotic medication (Kane, 1996). Given high attrition rates (Lieberman et al., 2005) and well documented side-effects of pharmacology (Hirsch et al., 2017), alternative/augmentative treatments have and continue to be sought. With respect to psychological treatments, in the UK the National Institute for Health and Care Excellence (NICE, 2014) recommend cognitive behavioural therapy (CBT) for individuals with a psychotic disorder.

The Evidence for CBT

CBT for psychosis largely works at the meaning level in that appraisals of psychotic experiences are targeted to reduce distress and improve functioning (Thomas et al., 2014). Published meta-analyses have consistently evidenced small to moderate pooled effect sizes for the benefits of CBT for psychosis (Burns, Erickson, & Brenner, 2014; Hazell, Hayward, Cavanagh, & Strauss, 2016; Jauhar et al., 2014; Wykes, Steel, Everitt, & Tarrier, 2008; Zimmermann, Favrod, Trieu, & Pomini, 2005). Although demonstrating efficacy, these modest effect sizes may in part be due to the choice of assessment outcomes selected in trials (Steel et al., 2007). The majority of included studies typically use symptom based measurements such as the positive and negative syndrome scale (PANSS; Kay, Opler, & Fiszbein, 1987) better suited to pharmacology trials. Therefore, the reappraisal of symptoms and a reduction in distress, targeted areas of CBT, are likely to be missed when symptom-specific measures are used (Birchwood & Trower, 2006). In addition, interventions

with a broad focus (e.g., targeting hallucinations and delusions) result in sample heterogeneity potentially further limiting treatment efficacy (Thomas et al., 2014). Indeed there has been calls for a more symptom-specific orientated approach in the understanding and treatment of psychosis (Freeman & Garety, 2014). The benefits of this approach include sample homogeneity (Ruddle, Mason, & Wykes, 2011) and a greater proportion of time spent on the treatment target (Thomas et al., 2014). Evidence for CBT interventions which specify a single treatment target are promising. In Jauhar et al. (2014) meta-analyses, the effect size of CBT for positive symptoms was 0.25, compared to the larger effect size of 0.34 found in the hallucination specific studies. Van der Gaag and Valmaggia (2014) report similar findings. They pooled data from 11 studies of CBT for AVH, delivered individually and in groups, and report an overall effect size of 0.44.

Group Therapy

There has been a growing interest in group therapy for individuals with schizophrenia and the potential benefits they may hold over individual based treatments (Orfanos, Banks, & Priebe, 2015). Given recommendations that psychological therapies should be offered to people with schizophrenia, group therapy may prove cost-effective in that they increase clinical capacity (Ruddle et al., 2011). This is of importance considering that approximately only 10% of individuals with schizophrenia receive CBT (Schizophrenia Commission, 2012). Furthermore, group therapy may improve social functioning and increase individual's social contact in a population found to have depleted social networks (Gayer-Anderson & Morgan, 2013). There are also several non-specific group processes such as the instillation of hope, interpersonal learning and group cohesiveness which have been proposed as potential mechanisms of change (Yalom & Leszcz, 2005).

Meta-analytic reviews have provided support for group therapy in clinical settings. Orfanos et al. (2015) conclude that group therapy – irrespective of approach – can improve negative symptoms and social functioning in individuals with schizophrenia. In addition, two further reviews (Hazell et al., 2016; Wykes et al., 2008) found that CBT delivered in a group setting did not moderate psychosis outcomes.

AVH Groups

Group therapy may hold several advantages over individual treatment in targeting AVH. Voice hearing is a stigmatised phenomenon often leading to increased isolation (Ruddle et al., 2011). However, AVH groups can provide a sense of 'universality' (Yalom & Leszcz, 2005) in that members can discuss and compare similar experiences reducing isolation. Symptom-specific groups also allow an opportunity for the shared testing of symptom-specific negative beliefs (e.g., 'I am being punished', 'I must be mad') and the sharing of tailored coping mechanisms (Ruddle et al., 2011).

The hearing voice network (Romme & Escher, 1989) is one forum providing a reduction in stigma and isolation for voice-hearing individuals (Oakland & Berry, 2015). Groups are peer-led and members report to value the connectivity and the safe environment they provide (Payne, Allen, & Lavender, 2017). Qualitative feedback has been positive (Dos Santos & Beavan, 2015), although the nature of such groups (e.g., open format, diverse ways of measuring recovery, varied interventions) have made it difficult for more formal quantitative evaluations (Beaven, de Jager, & dos Santos, 2017).

Group therapy for AVH have increasingly been applied within in clinical settings (Ruddle et al., 2011). These have predominantly been CBT informed groups

but there has been an emergence of more ‘third wave’ based approaches. CBT and third wave approaches, such as mindfulness based interventions, share a commonality in that symptom reduction is not a targeted aim (Chadwick, 2014). CBT interventions for voices typically target beliefs such as perceived AVH power and omnipotence (Birchwood, Meaden, Trower, Gilbert, & Plaistow, 2000), whereas mindfulness approaches focus less on belief change and more on acceptance of the voice hearing experience (Thomas et al., 2014). Rather than trying to avoid psychotic experiences, the approach encourages acceptance in order to reduce the likelihood of individuals getting caught up in a struggle with them (Strauss, Thomas, & Hayward, 2015). Mindfulness based interventions have been proposed to be of potential benefit to people with psychosis given that distressing experiences (i.e., AVH) often have a chronic course (Louise, Fitzpatrick, Strauss, Rossell, & Thomas, 2017). Reflecting a growing interest in mindfulness based interventions, two articles have reviewed its efficacy in improving AVH. Strauss et al. (2015), in their qualitative review, conclude that the mindfulness groups are acceptable for people with distressing voices but evidence for effectiveness is lacking. However, a recent quantitative analysis (Louise et al., 2017) did find a moderate and significant effect of the approach on general psychotic symptoms.

A qualitative review (Ruddle et al., 2011) provided mixed support for group therapy for AVH. Group approaches proved popular to members but there was limited support to justify their inclusion in clinical settings (Ruddle et al., 2011). Mindfulness groups had no clinical benefits and CBT groups showed some encouraging findings but results from controlled trials were less promising. A limitation of that review was that there was no quantitative examination of studies and a recommendation from that paper was that there may be value in including

diagnostic specific voice groups (Ruddle et al., 2011). Although AVH phenomenology appear similar across differing psychiatric disorders (Waters & Fernyhough, 2017), other factors may reduce likelihood of success in open groups. For example, emotional dysregulation and higher suspiciousness in individuals with borderline personality (Tschoeke, Steinert, Flammer, & Uhlmann, 2014) may impede participation. In addition, some AVH have distinct underlining origins such as in certain substance misuse populations (Mitchell & Vierkant, 1991). Therefore, the question of whether group therapy for AVH is more effective within a homogenous sample remains.

Review Aims

To date, the evidence for group therapy on AVH has been mixed (Ruddle et al., 2011). However, there has recently been an expansion in psychological interventions which may lend itself better to group formats such as mindfulness based approaches (Thomas et al., 2014). These 'third-wave' approaches have shown promise (Louise et al., 2017). To our knowledge there has been no meta-analysis conducted assessing the efficacy of group therapy – across therapeutic approaches – on AVH specific outcomes.

The current review therefore had two aims:

1) to update previous literature reviews and provide a synthesis of the current evidence base of group therapy for AVH within a diagnostic specific sample;
2) and evaluate the effectiveness of group therapy for AVH using a meta-analytic technique.

Methodology

Literature Search

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed (Moher et al., 2009). A literature search was conducted using three literature databases: MEDLINE, PsycINFO and Web of Science (WoS). All searches were conducted up to the end of December 2016. Each database was searched using the following terms (and Boolean operators): Group OR Group therap* OR group based therap* OR group psycho* (title) AND Auditory verbal hallucinations OR AVH OR auditory hallucinations OR voices OR positive symptoms OR psychosis OR schizo* OR hallucinations.

In addition, a hand search of relevant reviews and meta-analyses was carried out (Hazell et al., 2016; Jauhar et al., 2014; Orfanos et al., 2015; Ruddle et al., 2011; van der Gaag et al., 2014). This search resulted in an extra four articles for review. Please refer to Figure 1 for search strategy.

Inclusion Criteria

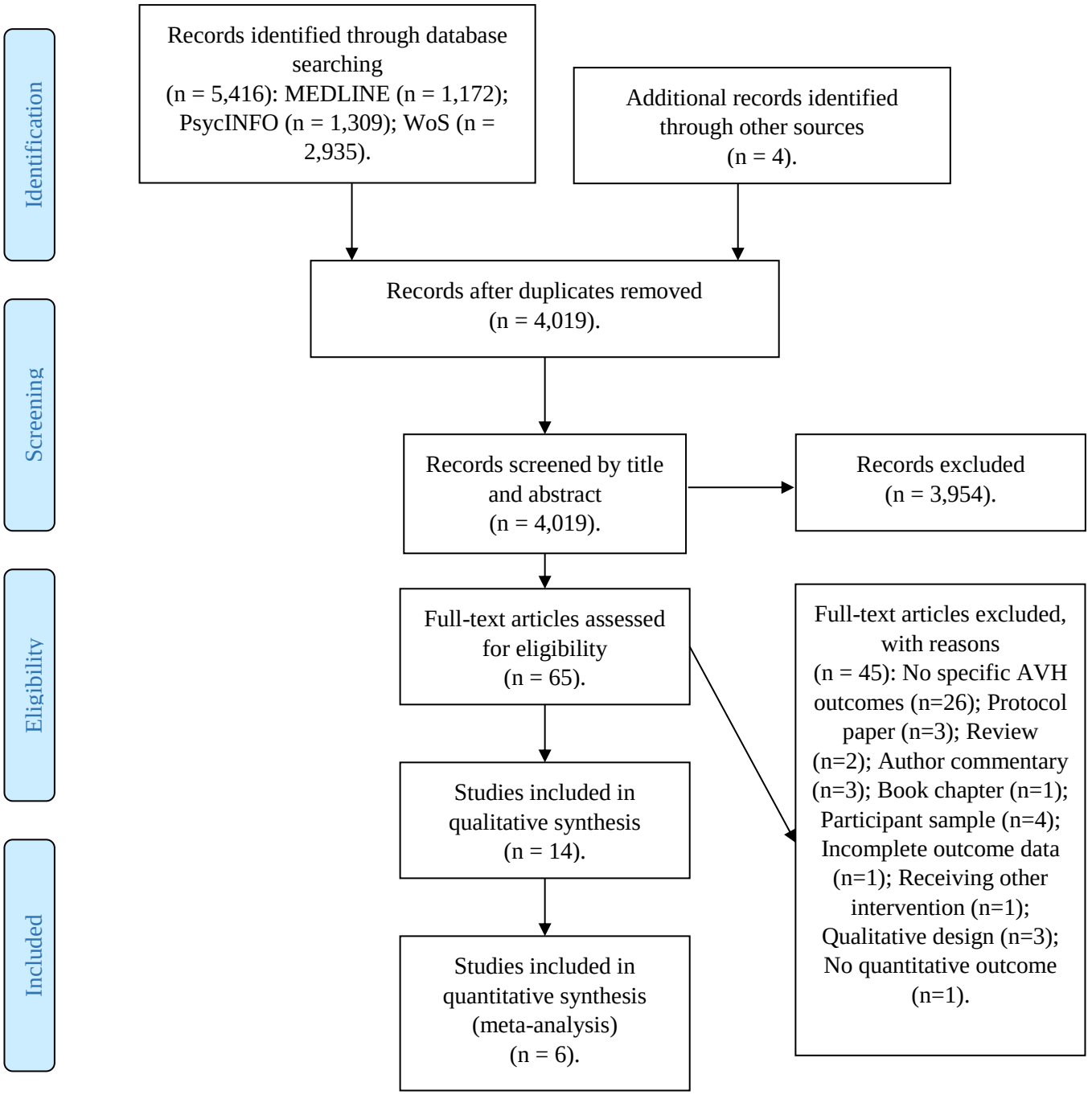
Studies were included if: 1) interventions were delivered in a group format; 2) papers were in English and published in peer reviewed journals; 3) at least 75% of the study sample had a diagnosis of schizophrenia or schizoaffective disorder, according to ICD (World Health Organisation, 1992) or DSM (American Psychiatric Association, 2000) criteria; 4) the study included at least one specific AVH quantitative outcome measure.

Exclusion Criteria

Articles were excluded if: 1) papers did not provide diagnostic information; 2) had no specific AVH quantitative outcome measure (e.g., only report totalled

PANSS scores); 3) participants were receiving another form of psychological therapy alongside group intervention.

Figure 1: *PRISMA diagram illustrating search strategy*



Study Extraction

All generated papers (n = 4,019) were screened at the title and abstract level. Sixty-five papers were then read and either included or excluded based on the criteria described above. Please see Appendix 1 for a reference list of excluded papers.

Quality Assessment

Included studies were assessed using the clinical trials assessment measure (CTAM; Tarrier & Wykes, 2004). The CTAM rates interventions across six areas of trial design: sample, allocation, assessment, control groups, analysis and active treatment. The maximum score a trial can receive is 100. Scores of 65 or above are suggestive of adequate methodology (Wykes et al., 2008). All trials included in this review were rated by the first author.

Meta-Analysis Procedure

The meta-analysis was conducted using Review Manager 5 (Version 5.3. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2014). Trials were included in the meta-analysis if they met the above-mentioned inclusion criteria and randomly allocated participants to either arm of the study. Post treatment data was selected to assess interventions. Mean and standard deviations derived from published trials were used to compute effect sizes. All trials used the same outcome measure - hallucination scale of the Psychotic Symptom Rating Scale (PSYRATS-AH; Haddock, McCarron, Tarrier, & Faragher, 1999).

A random effects model was selected as in accordance with recommendations made by Field and Gillett (2010). Although all included studies used the same outcome measure, we followed the consensus that the standardised mean difference (SMD) is more interpretable than the mean difference (Takeshima et al., 2014). We

therefore opted to present the SMD statistic, with <0 favouring the treatment condition.

Six studies met criteria for inclusion in the meta-analysis. Two trials included in the meta-analysis warrant careful evaluation. One study reported change from baseline scores (Chadwick, Hughes, Russell, Russell, & Dagnan, 2009). Authors were contacted but final measurement outcomes were unobtainable. One study reported non-full scale data (McLeod, Morris, Birchwood, & Dovey, 2007). Authors were contacted but we were unable to retrieve full-scale scores. Effect sizes for this study was therefore calculated by summing the two items (frequency, distress) together (Jauhar et al., 2014).

Sensitivity Analysis

Sensitivity analysis using a one-study-removed method were conducted to assess the influence of two trials on overall pooled effect sizes. The first sensitivity analysis was carried out to examine the effects of potential bias of selective reporting (McLeod et al., 2007). Next the removal of the non-specific AVH intervention (Moritz et al., 2013) was expected to increase the overall effect-size.

Heterogeneity

Heterogeneity was assessed using the statistical significance of Q and the I^2statistic. An approximate estimate to interpreting the I^2 is when 0%, 25%, 50%, 75%; no, low, moderate and high heterogeneity is assumed (Higgins, Thompson, Deeks, & Altman, 2003).

Publication Bias

Due to the small number of studies included in the meta-analysis funnel plots were not produced to examine publication bias (Higgins & Green, 2011).

Results

Interventions that specified AVH as the treatment target were defined as AVH specific. Broader treatments such as those which aimed to reduce overall psychotic symptomatology were considered non-AVH specific.

The results presented below are separated by AVH specific interventions and non-AVH specific interventions. The assessment of efficacy is then separated into a qualitative review (n = 14) and meta-analytic review (n = 6).

Characteristics of Included Studies

Fifteen articles reported outcomes from AVH specific interventions (Buccheri et al., 2004; Buccheri, Trygstad, & Dowling, 2007; Chadwick, Sambrooke, Rasch, & Davies, 2000; Chadwick, Hughes, Russell, Russell, & Dagnan, 2009; Chadwick et al., 2016; Dannahy et al., 2011; McLeod et al., 2007; Penn et al., 2009; Pinkham, Gloege, Flanagan, & Penn, 2005; Ruddle et al., 2014; Trygstad et al., 2002; Mortan, Sutcu, & Kose, 2011; Wykes et al., 2005; Wykes, Parr, & Landau, 1999; Zanello, Mohr, Merlo, Huguelet, & Rey-Bellet, 2014). Five papers described non-AVH specific interventions (Chung, Yoon, Park, Yang, & Oh, 2013; Gledhill, Lobban, & Sellwood, 1998; Lecomte, Leclerc, & Wykes, 2012; Moritz et al., 2011; Moritz et al., 2013).

Studies were predominately conducted in the UK (n = 9) and North America (n = 6). Six were undertaken since 2012. The average quality score of the included studies (Table 1) was 40 out of 100 (range 16-86). Only four trials are considered methodologically adequate (score of > 65 on the CTAM; Wykes et al., 2008). There were seven randomised controlled trials (RCT), six of which were included in the

meta-analysis. Low CTAM scores reflect the predominance of uncontrolled designs, unblinded assessments and the use of convenience sampling (i.e., clinic attenders).

Table 1: *Quality assessment of included studies*

Study. Year, country.	Design	Blind Assessments	CTAM Score
Penn et al. (2009), USA.*	RCT	Yes	86
Moritz et al. (2013), Germany.*	RCT	Yes	82
Chadwick et al. (2016), UK.*	RCT	Yes	81
Wykes et al. (2005), UK.*	RCT	Yes	73
Moritz et al. (2011), Germany.	RCT	Yes	61
Lecomte et al. (2012), Canada.	Follow up	Yes	52
Chadwick et al. (2009), UK.*	RCT	No	46
Dannahy et al. (2011), UK.	Pre-post	No	40
Wykes et al. (1999), UK.	Non-randomised	No	39
McLeod et al. (2007), UK.*	RCT	No	35
Zanello et al. (2014), Switzerland.	Pre-post	No	33
Chadwick et al. (2000), UK.	Pre-post	No	29
Ruddle et al. (2014), UK.	Case series	No	28
Mortan et al. (2011), Turkey.	Non-randomised	No	25
Pinkham et al. (2005), USA.	Pre-post	No	19
Chung et al. (2013), Korea.	Pre-post	No	19
Trygstad et al. (2002), USA.	Pre-post	No	19
Buccheri et al. (2004), USA.	Follow up	No	19
Buccheri et al. (2007), USA.	Pre-post	No	19
Gledhill. et al (1998), UK.	Pre-post	No	16

Note. * = Study included in the meta-analysis. RCT = Randomised controlled trials. CTAM = Clinical Trials Assessment Measure.

Scales that measure symptom reduction were most common and the majority of trials used summed scores to assess efficacy. Included symptom measures were: the PSYRATS-AH (Haddock et al., 1999); Brief Psychiatric Rating Scale – Auditory Hallucinations (BPRS-AH; Ventura, Green, Shaner, & Liberman, 1993); Characteristics of Auditory Hallucinations (CAHQ; Trygstad et al., 2002); Characteristics of Auditory Hallucinations – Expanded Version (CAHQ-EV; Buccheri, Trygstad, & Dowling, 2007); Topography of Voices Rating Scale (TVRS; Hustig & Hafner, 1990); and the Psychiatric Assessment Scale (PAS; Krawiecka, Goldberg, & Vaughan, 1977).

More in line with the aims of psychological therapies for psychosis were the selection of outcomes which assessed change in beliefs and relating with voices. Included questionnaires were: Beliefs About Voices Questionnaire (BAVQ; Chadwick & Birchwood, 1995); Beliefs About Voices Questionnaire – Coping Strategies (BAVC; Chadwick & Birchwood, 1995); Beliefs About Voices Questionnaire – Revised (BAVQ-R; Chadwick, Lees, & Birchwood, 2000); and the Voice and You scale (VAY; Hayward, Denney, Vaughan, & Fowler, 2008).

Three studies (Chadwick et al., 2000; Dannahy et al., 2011; Ruddle et al., 2014) used idiosyncratic measures to rate subjective experiences in AVH beliefs, distress and control.

Participant Characteristics

Across all 20 studies, a total of 587 participants were recruited to a group intervention under review. Out of these, 97.7% had a diagnosis of either schizophrenia or schizoaffective disorder (as determined by ICD or DSM criteria). Details on how these diagnoses were established (i.e., though clinical interviews, chart reviews) were not available in most of the papers.

AVH Specific Interventions

Where articles provided demographic data the average age of participants was 41.6 years. All but one study (Dannahy et al., 2011) recruited more males than females. Regarding symptomatology, a chronic picture emerged with participants experiencing severe and chronic AVH, hearing voices for at least two years. Where baseline PSYRATS-AH total scores are reported (Chadwick et al., 2009; Chadwick et al., 2016; Penn et al., 2009; Pinkham et al., 2004; Wykes et al., 2005) the average

total score was 28.42 out of a possible 44. This is similar to other scores found in schizophrenia samples (e.g., Steel et al., 2007).

Non-AVH Specific Interventions

The average age of participants was 32.42 years, with more males than females recruited. Two (Chung et al., 2013; Lecomte et al., 2012) of the five non-AVH specific interventions were conducted within an early onset psychosis setting aimed at improving clinical status and obtaining personal goals. Less detail on AVH symptomology is provided across the non-AVH specific interventions. Where baseline PSYRATS-AH total scores are reported (Chung et al., 2013; Moritz et al., 2011; Moritz et al., 2013) the average total score was 4.63, representing a low symptom profile.

Intervention Characteristics

Details of the 20 included group interventions are provided in Table 2. Group interventions can be clustered into four broad interventions: CBT approaches, mindfulness based cognitive therapy interventions (MI), behavioural management strategies (BM) and metacognitive training (MCT). Group interventions were typically low-intensity, with only two groups (Lecomte et al., 2012; Pinkham et al., 2005) providing more than 16 sessions.

Table 2*: Intervention characteristics*

	Study	Intervention approach and aim	Description of intervention	Number of sessions	Number of weeks	Therapy dropout n (%)
AVH Specific interventions	Wykes et al. (1999).	CBT. Reduce AVH symptoms and increase insight.	Manual based CBT intervention with each session having a different aim. These were: sharing information about AVH; exploring models of psychosis; exploring beliefs about AVH; developing effective coping strategies; improving self-esteem; developing an overall model of coping with AVH.	6	6	NR
	Wykes et al. (2005).*	CBT. Reduce AVH symptoms.	Followed Wykes et al. (1999) manual (see above).	6	6	NR
	Pinkham et al. (2005).	CBT. Reduce AVH symptoms among inpatients.	Two groups: Group 1 = Followed the Wykes et al. (1999) manual (see above). Group 2 = Followed expanded version of the Wykes et al. (1999) manual (see above). The main change was that more time was spent on difficult topics (e.g., stigma) and additional homework assigned.	Group 1 = 7 Group 2 = 20	Group 1 = 7 Group 2 = 10	NR
	Penn et al. (2009).*	CBT. Reduce AVH symptoms and dysfunctional beliefs about AVH.	Modified Wykes et al. (1999) manual in the following way: emphasised coping skills rather than cognitive restructuring; deemphasised self-esteem work; expanded protocol to 12 sessions.	12	12	6 (19%)
	Ruddle et al. (2014).	CBT. Reduce AVH symptoms.	Followed Wykes et al. (1999) manual (see above). Updated to include discussion on stigma.	7	7	6 (29%)
	Zanello et al. (2014).	CBT. Reduce AVH symptoms and dysfunctional beliefs about AVH.	Followed Wykes et al. (1999) manual (see above).	7	7	15 (39%)
	Chadwick et al. (2000).	CBT. Challenge beliefs about AVH.	Manual based intervention which included: exploration of group members' experiences (i.e., when AVH first begun); Socratic dialogue aimed to weaken omnipotence and control beliefs; and AVH as internally generated.	8	8	3 (14%)

(cont.)	Study	Intervention approach and aim	Description of intervention	Number of sessions	Number of weeks	Therapy dropout n (%)
AVH Specific interventions	McLeod et al. (2007).*	CBT. Increase power and control over AVH.	Manual based intervention. First few sessions were designed to encourage engagement and promote group cohesion. Power and control of AVH were then examined and alternative explanations for AVH explored. Towards the end of therapy, focus turned to developing coping strategies.	8	8	0
	Mortan et al. (2011).	CBT. Reduce AVH symptoms among inpatients.	Manual based intervention which included: psychoeducation on AVH; developing coping strategies; behaviour experiments to enhance control over AVH; cognitive restructuring; and AVH as internally generated.	9-10	5	1 (14%)
	Trygstad et al. (2002).	BM. Reduce AVH symptoms.	Manual based intervention. In each session, members are taught and practice one behavioural strategy. These include: self-monitoring, talking with someone, listening to music, watching TV, ignoring AVH, relaxation techniques, and not talking alcohol/drugs.	10	10	NR
	Buccheri et al. (2004).	BM. Reduce AVH symptoms.	Followed Trygstad et al. (2002) manual (see above).	10	10	NR
	Buccheri et al. (2007).	BM. Reduce command AVH.	Followed Trygstad et al. (2002) manual (see above).	10	10	NR
	Chadwick et al.(2009).*	MI. Improve well-being, AVH distress, perceived AVH control and relationship with AVH.	Manual based intervention. Sessions comprised two (10 minutes) guided mindfulness practice exercises to facilitate acceptance of AVH. This was followed by reflective group discussion aimed at facilitating understanding and metacognitive understanding. Discussion used guided discovery to encourage participation rather than didactic teaching.	10	5	2 (18%)

(cont.)	Study	Intervention approach and aim	Description of intervention	Number of sessions	Number of weeks	Therapy dropout n (%)
AVH Specific interventions	Dannahy et al. (2011).	MI. Improve well-being, AVH distress, perceived AVH control and relationship with AVH.	Manual based intervention which included: exploration of group members' experiences (i.e., when AVH first begun); acceptance of hearing AVH in a way that reduces distress and allows self-acceptance; Socratic dialogue and behavioural experiments aimed to weaken omnipotence and control beliefs. Acceptance of hearing AVH was supported through mindfulness practice.	8-12	9-12	12 (19%)
	Chadwick et al. (2016).*	MI. Improve well-being, AVH distress, perceived AVH control and relationship with AVH.	As outlined in Dannahy et al. (2011; see above).	12	12	15 (28%; did not attend at least 8 sessions = 'non-completers')
Non-specific	Gledhill. et al (1998), UK.	CBT. To improve persistent positive symptoms. Increase self-esteem, control over experiences and knowledge.	First four sessions focused on engagement, setting goals and addressing issues around stigma. In the final four sessions, focus was on coping strategies with detailed assessment of the symptom along with specific antecedent/consequences. A symptom formulation (e.g., AVH as internally generated) was also introduced into group discussion.	8	8	1 (20%)
	Lecomte et al. (2012), Canada.	CBT. To improve symptoms in early psychosis.	Manual based intervention which is built in four parts: stress – how it affects me; testing hypotheses and looking for alternatives; drugs, alcohol, and how I feel; and coping and competence. Manual follows positive approach (rather than problem based) with specific emphasis on reaching personal goals etc[1].	24	12	6 (12%)[1]

(cont.)	Study	Intervention approach and aim	Description of intervention	Number of sessions	Number of weeks	Therapy dropout n (%)
Non-specific	Chung et al. (2013), Korea.	CBT. To improve positive symptoms in early psychosis.	Manual based intervention which included: enhancing emotional flexibility; enhancing thought flexibility; enhancing personality flexibility; and changing life direction.	12	12	NR
	Moritz et al. (2011), Ger.	MCT. Target cognitive biases putatively involved in the pathogenesis of schizophrenia.	Manual based intervention which targets delusion-relevant cognitive biases: dysfunctional attributions; jumping to conclusions; belief inflexibility; deficits in social cognition; overconfidence in errors; and emotional problems.	8	8	0
	Moritz et al. (2013), Ger.*	MCT. Target cognitive biases putatively involved in the pathogenesis of schizophrenia.	As outlined in Moritz et al. (2011; see above).	8	8	NR

Note. *=Included in the meta-analysis. CBT = Cognitive behavioural therapy. MI = Mindfulness based cognitive therapy. BM = Behavioural management. MCT = Metacognitive training. NR = Not reported. [1] = Detailed in Lecomte et al. (2008).

AVH Specific Interventions

Nine AVH specific interventions were CBT based (Chadwick et al., 2000; McLeod et al., 2007; Mortan et al, 2011; Pinkham et al., 2005; Penn et al., 2009; Ruddle et al., 2014; Wykes et al., 1999; Wykes et al., 2005; Zanello et al., 2014). Consistent with cognitive models of psychosis, the CBT programmes typically aimed to challenge dysfunctional beliefs about AVH. The groups provided information on voice hearing and explored models of hallucinations (e.g., identifying maintaining factors). Time was also spent on developing effective coping strategies and increasing self-esteem.

Three studies (Chadwick et al., 2009; Chadwick et al., 2016; Dannahy et al., 2011) emphasised acceptance of voice hearing through in-session mindfulness practice. During mindfulness practice participants were guided to attend to voices and to become aware of habitual unhelpful coping strategies (e.g., avoidance) and the role they play in perpetuating distress.

Three papers described a BM approach. The protocol included the development of behavioural strategies (e.g., talking with someone, watching TV, ignoring voices) to decrease distress in voice hearing. In two of these studies (Buccheri et al., 2004; Trygstad et al., 2002) BM strategies were taught to participants in order to improve symptom management. The same approach was later used to reduce prevalence of command AVH (Buccheri et al., 2004).

Non-AVH Specific Interventions

Three papers detail CBT interventions. Gledhill et al. (1998) provided eight weekly sessions with the aim of developing self-esteem and increasing control and awareness of positive symptoms. Participants received 24 sessions of group CBT in

Lecomte et al. (2012). The approach incorporated key principles of CBT but tailored these for individuals with early psychosis. It placed emphasis on reaching personal goals. Similarly, Chung et al. (2013) trialled a 12-week programme with emphasis placed on obtaining personal goals. It also aimed to enhance emotional, cognitive and personality flexibility.

Two MCT programmes (Moritz et al., 2011; Moritz et al., 2013) targeted cognitive biases in the putative maintenance of positive symptoms. The intervention focused on increasing participant knowledge about cognitive distortions (e.g., jumping to conclusions) and the effect these biases have on psychotic symptoms.

Acceptability

The acceptability of groups under review were measured by reported treatment dropout rates, a feasible proxy for satisfaction (Strauss et al., 2015).

AVH Specific Interventions

Nine papers provided data on intervention dropout rates (Chadwick et al., 2000; Chadwick et al., 2009; Chadwick et al., 2016; Dannahy et al., 2011; McLeod et al., 2007; Mortan et al., 2011; Penn et al., 2009; Ruddle et al., 2014; Zanello et al., 2014). Average group treatment dropout was 20% (range 0 – 39%; median 19%), suggesting that group therapy was acceptable. Dropout rates for the BM interventions are not reported. McLeod et al. (2007) was the only AVH specific intervention to report no dropouts. In this study, participants were offered the option of when the group should run suggesting that enhanced collaboration with potential members may improve attrition rates.

When group intervention was compared against a non-symptom specific therapy (supportive counselling in Penn et al., 2009) there was no significant difference between group dropout.

Non-AVH Specific Interventions

Three articles provide data on treatment drop out. One person refused group therapy (out of five) in Gledhill et al. (1998) intervention. Six individuals (out of 48) did not complete CBT group therapy in Lecomte et al. (2012; as detailed in Lecomte et al., 2008). Dropout rates were lower in the CBT group than the skills management group (as detailed in Lecomte et al., 2008), indicating that CBT groups proved more tolerable and appealing to individuals with early onset psychosis.

All 18 participants completed MCT in Mortiz et al., (2011). Treatment dropout in Moritz et al., (2013) is not reported. However, individuals allocated to the MCT group attended more sessions than those in the active individualised comparison arm of the trial. MCT seems a tolerable form of group therapy among remitted patients.

Efficacy

Qualitative Synthesis

There were 14 studies included in the qualitative synthesis. Table 3 provides study details and results.

AVH Specific Interventions

Evidence for CBT group therapy on AVH symptom reduction is mixed. Two uncontrolled trials (Chadwick et al., 2000; Pinkham et al., 2005) failed to show significant improvements on AVH symptoms following intervention. Zanello et al. (2014) study did find improvements on an AVH item (from the BPRS-AVH) but

statistical significance did not survive Bonferroni corrections. Despite this more positive finding there was no control group and dropout rates were high in that study. Wykes et al. (1999) assessed a CBT intervention against a wait list control and found that improvements in AVH symptoms in the CBT group approached significance. Individuals also increased their repertoire of coping strategies following therapy termination. Mortan et al. (2011) CBT group with inpatients found significant reduction in AVH symptoms following treatment, which was maintained at one year follow up. However, this study was methodologically limited and did not randomly allocate participants to treatment.

A BM programme was more successful in improving AVH topography items as measured by the CAHQ. Trygstad at al. (2002) found significant improvements on six out of the seven topography items (including the distress item). Buccheri et al. (2004) followed these participants up at three-month intervals. At one year follow up, four of the six AVH topography items remained significant. The findings suggest that for improvements to be sustained ongoing intervention may be necessary (Ruddle et al., 2011). The same intervention was also used for command hallucinations. This article (Buccheri et al., 2007) provides descriptive data to suggest that the intervention reduced prevalence of command hallucinations. A limitation of the collection of these findings is that a control group is not provided and therefore positive changes may have occurred outside group therapy.

A key aspect of CBT for voices is to weaken perceived voice omnipotence and increase hearer control (Birchwood et al., 2000). This was achieved in three studies (Chadwick et al., 2000; Dannahy et al., 2011; Pinkham et al., 2005). Two papers provide evidence that beliefs about voices may mediate voice related distress. Wykes et al. (1999) report a significant association between an increase in hearer

power and reduced hearer distress. Similarly, Ruddle et al. (2014) found that change in negative beliefs about AVH were closely associated with changes in distress. However, the authors of the latter study do acknowledge that the reverse may have occurred and caution against definitive conclusions in the absence of mediation analysis. Zanello et al. (2014) CBT group failed to find any changes in voice beliefs but this was a secondary aim of their group.

One aim of MI approaches is to support individuals change their relationship with their voices (Strauss et al., 2015). This was partially achieved in Dannahy et al. (2011) where hearer dependence improved. However, there were no benefits on hearer distance, voice dominance and intrusiveness. These findings are not entirely surprising given that mindfulness practice encourages engagement with voices.

Finally, where distress items are provided (Dannahy et al., 2011; Ruddle et al., 2014; Trygstad et al. 2002) there is support for the use of group therapy. However, caution is required. A reduction in distress was not sustained at follow up in one study (Buccheri et al., 2004). Furthermore, the use of non-standardised assessments (Dannahy et al., 2011; Ruddle et al., 2014) and the limitation that the CAHQ (developed by Trygstad et al., 2002) is yet to be psychometrically examined, means that the findings are at major risk from bias (Marshall et al., 2000).

Evidence for group therapy for AVH remains inconclusive. There is little evidence to support the use of CBT informed groups in reducing overall AVH symptoms. There is more promising evidence for the use of group therapy across approaches on reducing distress, challenging beliefs about voices and modifying certain aspects of the voice-hearing relationship. However, without a control group it is difficult to attribute improvements to group therapy. Furthermore, issues with

assessments (unblinded and non-standardised measures) caution against definitive conclusions.

Non-AVH Specific Interventions

AVH symptom reduction was not achieved in the non-AVH specific interventions. In Gledhill et al. (1998), treatment resulted in no change and in one case, worse AVH outcomes. Small intervention sample size (n = 4) makes it difficult to determine whether group therapy contributed to iatrogenic effects. Given low AVH symptom profiles in two studies (Chung et al., 2013; Moritz et al., 2011) floor effects may explain why changes in AVH symptoms were not observed.

Lecomte et al. (2012) provide one year follow up data from a methodological robust randomised controlled trial (as detailed in Lecomte et al., 2008). Individuals who received group CBT showed a significant decrease in beliefs of voice malevolence and omnipotence at 12-month follow up. However, hallucinations increased between six and 12-month follow up, returning closer to baseline values. With high attrition rates (only 14 participants were followed up at 12-month out of a possible 48) it is difficult to determine whether any changes were due to intervention or the fluctuating nature of early psychosis (Addington & Addington, 2008). What it does provide is some support that CBT is successful in challenging beliefs about voices but not reducing overall symptoms.

As expected, the non-specific interventions proved less successful in targeting AVH symptoms. This is unsurprising given the broad focus of interventions and that not all group members may have experienced AVH.

Table 3: *Description of included studies in the qualitative analysis*

	Study. Year, country.	Approach	Participants				Recruited sample description			Setting	AVH Outcomes	Results
			n	Age (SD)	M %	Scz %	AVH %	Duration of AVH	AVH daily %			
AVH specific interventions	Wykes et al. (1999),UK. [#]	CBT	21	40	NR	100%	100%	14 years	75%	O	• PSYRATS -AH • BAVC	• Difference on total PSYRATS-AH scores between group and wait-list[~]. Distress[+] Increase in coping strategies[+], although not maintained at follow up. Beliefs about power[~].
	Chadwick et al. (2000), UK.	CBT	22	NR	NR	100%	100%	>2 years	NR	O/I	• TVRS • Belief Conviction [&]	• No change on total TVRS scores. • Reduction in conviction in beliefs about AVH omnipotence[++]and control [++]. No change in beliefs about AVH personal meaning.
	Pinkham et al. (2005), USA.	CBT	11	39.6	73 %	100%	100%	NR	NR	I	• PSYRATS -AH • BAVQ-R	• Reduction in total PSYRATS-AH scores[~]. • Reduction in total BAVQ-R scores [+].
	Mortan et al. (2011), Turkey. [#]	CBT	7	44	100 %	100%	100%	NR	NR	I	• SAPS-AH	• Reduction in total SAPS-AH scores[+] in CBT group, not in the control group.
	Ruddle et al. (2014), UK.	CBT	21	NR	NR	100%	100%	NR	NR	O	• PSYRATS -AH[^] • BAVQ-R	• Change in beliefs about AVH malevolence and omnipotence correlated most frequently with a change in distress.
	Zanello et al. (2014), Swiz.	CBT	38	4 (9)	58 %	100%	100%	73%>15 years		O	• BPRS – AH • BAVQ-R	• Change on hallucinatory item[++] although did not remain significant after Bonferroni correction for multiple comparisons. • No change in any AVH beliefs.

	Study. Year, country.	Approach	Participants				Recruited sample description			Setting	AVH Outcomes	Results
			n	Age (SD)	M %	Scz %	AVH %	Duration of AVH (years)	AVH daily %			
AVH specific interventions	Dannahy et al. (2011), UK.	MI	62	41.1 (9.2)	35 %	89%	100%	14.3	100%	O	• VAY • Voice distress & control[&]	• Change on VAY hearer dependence at 1-month follow up[+]. No change on other VAY items (i.e., intrusiveness, dominance, distance). • Change in AVH distress[++] and control[++].
	Trygstad et al. (2002), USA.	BM	62	44.1	73 %	100%	100%	20	100%	O	• CAHQ	• Change on AVH topography items: frequency[++], self-control[+], clarity[++], tone[+], distractibility[++], distress[+]. No change on loudness item.
	Buccheri et al. (2004), USA.[%]	BM	62	44.1	NR	100%	100%	20	100%	O	• CAHQ	• Change on AVH topography items maintained at 1-year follow up: frequency[+], self-control[++], clarity[++], distractibility[+]. No change on loudness, tone and distress items.
	Buccheri et al. (2007), USA.[!]	BM	57[!]	NR	NR	100%	100%	20	100%	O	• CAHQ-EV	• Decrease in command hallucinations. No inferential statistics reported.
Non-specific	Gledhill et al. (1998), UK.	CBT	4	41	50 %	100%	100%	NR	NR	O	• PAS	• One of the 4 participant's AVH became worse. No change in the remaining 3 KGV scores. No inferential statistics reported.
	Lecomte et al. (2012), Canada.[!]	CBT	14[!]	25 (4.8)	NR	86%	NR	NR	NR	O; EP.	• BAVQ	• Change in beliefs about AVH malevolence[+] and omnipotence[+] at 1-year follow up. Beliefs about AVH benevolence, engagement and resistance items are not reported.

	Study. Year, country.	Approach	Participants				Recruited sample description			Setting	AVH Outcomes	Results
			n	Age (SD)	M %	Scz %	AVH %	Duration of AVH (years)	AVH daily %			
Non-specific *(cont.)*	Chung et al. (2013), Korea.	CBT	24	25.7 (4.8)	79 %	79%	NR	NR	NR	O; EP.	• PSYRATS -AH	• No change in total PSYRATS-AH scores.
	Moritz et al. (2011), Ger.[#]	MCT	18	33.6 (8.8)	100 %	100%	NR	NR	NR	O/I	• PSYRATS -AH	• No change in total PSYRATS-AH scores.

Note.[#] = Included control as comparison. [!] = Follow up study. Swiz = Switzerland. Ger = Germany. n = Recruited sample to treatment intervention . M = Male sex. Scz = Schizophrenia/schizoaffective disorder. I = Inpatient. O = Outpatient. EP = Early psychosis sample. NR = Not reported. CBT = Cognitive behavioural therapy. MI = Mindfulness based cognitive therapy. BM = Behavioural management. MCT = Metacognitive training. PSYRATS – AH = Psychotic symptom rating scale - Auditory hallucinations. BAVQ = Beliefs about voices questionnaire. BAVC = Beliefs about voices questionnaire – Coping Strategies. BAVQ-R = Beliefs about voices questionnaire – Revised. VAY = Voice and you scale. TVRS = Topography of voices rating scale. BPRS-AH = Brief psychiatric rating scale- Auditory hallucination. CAHQ =Characteristics of auditory hallucinations. CAHQ-EV = Characteristics of auditory hallucinations-Expanded version. PAS = Psychiatric assessment scales. [^] = Distress measure calculated by combining PSYRATS-AH items with visual analogue scale. [&] = Visual analogue scale. [+] = p <.05. [++] = p<.01. [~] = Improvement approaching significance.

Table 4: *Description of included studies in the quantitative analysis*

	Study. Year, country.	AVH Outcome	Setting	Intervention						Control					
				Approach	n	Age (SD)	M%	Scz%	Mean (SD) baseline PSYRATS-AH score	TAU or Active	n	Age (SD)	M%	Scz%	Mean (SD) baseline PSYRATS- AH score
AVH Specific interventions	Wykes et al. (2005), UK.	PSYRATS-AH	O	CBT	45	39.7 (10.8)	53%	100%	29.1(5.3)	TAU	40	39.7 (10.1)	65%	100%	26.8(6.8)
	McLeod et al. (2007), UK.	PSYRATS-AH[1]	O	CBT	10	NR	NR	100%	NR[1]	TAU	10	NR	NR	100%	NR[1]
	Chadwick et al. (2009), UK.	PSYRATS-AH	O	MI	9	41.6 (8.1)[#]	NR	100%	29.6[#]	TAU	9	41.6 (8.1)[#]	NR	100%	29.6[#]
	Penn et al. (2009), USA.	PSYRATS-AH	O	CBT	32	41.7 (11.8)	53%	100%	26.5(5.5)	Active	33	39.6 (15.7)	49%	100%	28.8(5.1)
	Chadwick et al. (2016), UK.	PSYRATS-AH	O	MI	54	42	50%	100%	30.4(5.6)	TAU	54	42	48%	100%	30.2(7.1)
Non-specific	Moritz et al. (2013), Ger.	PSYRATS-AH	O/I	MCT	76	36.8 (11.1)	59%	100%	5.7(10.1)	Active	74	32.9 (9.5)	66%	100%	5.6(11.4)

Note. Ger = Germany. PSYRATS – AH = Psychotic symptom rating scale - Auditory hallucinations. [1] = Not full-scale PSYRATS-AH. I = Inpatient. O = Outpatient. CBT = Cognitive Behavioural Therapy. MI = Mindfulness based cognitive therapy. MCT = Metacognitive Training. n = Participant allocation. M = Male sex. Scz = Schizophrenia/schizoaffective disorder. [#] = Study sample mean. NR = Not reported. TAU = Treatment as usual or wait list.

Meta-analysis

Table 4 provides details of the six studies included in the meta-analysis. Five of these assessed specific AVH group interventions (Chadwick et al., 2009; Chadwick et al., 2016; McLeod et al., 2007; Penn et al., 2009; Wykes et al., 2005). There were post-intervention outcome data for 203 participants in an intervention arm. Two studies (Moritz et al., 2013; Penn et al., 2009) compared the experimental intervention against an active control condition.

Meta-Analysis Results

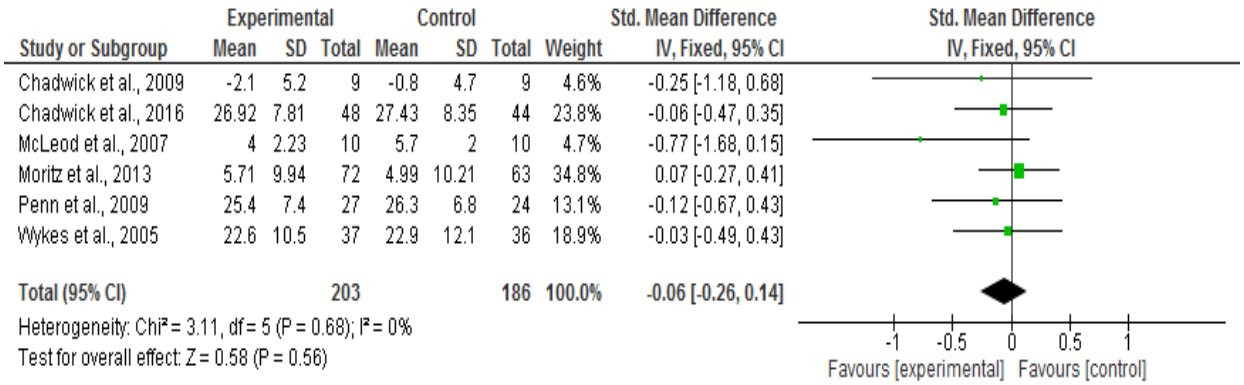
Where effect sizes are 0.20, 0.50, 0.80; small, medium and large effects are assumed (Cohen, 1992). Table 5 and Figure 2 display a non-significant small pooled effect size (-0.06, 95% CI [- 0.26 – 0.14]) indicating there is no evidence to suggest that group interventions have an effect on AVH outcomes as measured by the PSYRATS-AH. Recalculating the effect size excluding McLeod et al. (2007) (due to potential reporting bias) and Moritz et al. (2013) (non-specific intervention) made little difference to the findings (-0.02, 95% CI [- 0.23 – 0.18] and -0.08, 95% CI [- 0.34 – 0.18] respectively). Homogeneity was assumed in all analyses.

Table 5: *Pooled ES, 95% CI and heterogeneity of analyses*

Meta-analysis		Number of studies	ES	*p*	95% CI	Heterogeneity	
						p value of Q	I^2
Main		6	-0.06	.68	-0.26 – 0.14	.68	0%
Sensitivity analyses	McLeod et al. (2007) excluded	5	-0.02	.96	-0.23 – 0.18	.96	0%
	Moritz et al. (2013) excluded	4	-0.08	.99	-0.34 – 0.18	.99	0%

*Note.*ES = Pooled effect size. 95% CI = Confidence interval.

Figure 2: *Forest plot of effect sizes and 95% CI for post-intervention outcomes for AVH symptoms*



Discussion

Main Findings

This review updated previous articles (Ruddle et al., 2011) and provides a qualitative and quantitative synthesis on the effect group therapy has on AVH outcomes. Twenty studies met inclusion criteria, with 15 of these considered AVH specific interventions. The majority of approaches were CBT informed and most trials were of relatively poor quality. The included papers indicate that there is limited support for the use of group therapy in reducing AVH symptoms, with no benefits evident in the pooled assessment of the included RCTs. There are more encouraging findings for the effect group therapy exerts on AVH beliefs, voice relating and distress, although more methodological rigorous trials are required to assess efficacy.

Specific AVH groups proved more effective than groups with broader aims (e.g., to reduce positive symptoms) on AVH outcomes. This is consistent with evidence indicating larger effect sizes among symptom-specific trials (e.g., Jauhar et al., 2014). These results are unsurprising given that a greater proportion of time could be allocated to specific symptoms, including putative mechanisms of change,

such as voice power (as occurs in Birchwood et al., 2014). In the included RCTs there was no significant effect of AVH specific treatments on PSYRATS-AH total scores (McLeod et al., 2007 report item only data). The meta-analyses conducted here therefore does not support the use of group therapy on reducing AVH topography as measured by the total PSYRATS-AH scale. However, the controlled trials tended to be underpowered. This makes it difficult to conclusively determine whether the findings are a result of type II error or whether group therapy genuinely has no effect on AVH symptomatology

Interpreting the Findings

The majority of included AVH specific interventions were low intensity in that they provided fewer than 16 sessions. One study (Pinkham et al., 2005) found that a higher intensity of therapy (twenty sessions) did not result in greater gains than a shorter protocol (seven sessions). However, this was among inpatients limiting generalisability. In contrast, Lecomte et al. (2013) offered 24 sessions of CBT for psychosis and found change in beliefs about voices were maintained at one year follow up, suggesting that more intense treatment may provide greater sustained improvements. In addition, group processes have been found to exert their greatest effect over longer treatments (Orfanos et al., 2015). Therefore, brief interventions may miss the benefit group processes potentially may have on outcomes. Further research is needed to assess whether more intensive group treatment programmes confer more promising outcomes.

Psychological interventions are not neuroleptics but instead aim to reduce distress and improve functioning (Birchwood & Trower, 2006). However, symptom specific measures – such as the PSYRATS-AH – remain a popular choice in examining efficacy. The use of such scales therefore fails to adequately measure

targeted aims of psychological therapies (i.e., voice related distress, voice-hearer power), providing only an indirect measure of treatment efficacy (Louise et al., 2017). To address this, there has been calls to include PSYRATS-AH item data (such as the distress item) as-well-as cumulative scores (Steel et al., 2007). This is due to summed scores introducing noise from other dimensions, such as the location and frequency of voices, not targeted by psychological interventions (Thomas et al., 2014). Incidentally, authors of all the studies included in our meta-analysis were contacted requesting PSYRATS-AH item data but this request was unsuccessful. Where included studies did report items measuring distress, results are more promising. Our review highlights the need for appropriate outcome measures in the assessment of psychological therapies.

Clinical and Research Implications

Twelve studies reported treatment dropout rates. The average attrition rate (AVH specific and non-specific groups combined) was 19%. Although high treatment attrition rates are not uncommon in schizophrenia samples (for example Borras et al., 2009 report 37%), the findings presented in this review are encouraging. For instance, in a recent meta-analysis (Fernandez, Salem, Swift, & Ramtahal, 2015) of 115 studies with 20,995 psychiatric participants the group therapy dropout rate was 25%. This review suggests that group therapy is an acceptable treatment format for individuals with schizophrenia. Furthermore, the benefits of meeting others and potentially developing a social network may be particularly beneficial to individuals with schizophrenia. The way people relate to their voices have been found to be mirrored in their social relationships (Hayward, 2003). Therefore, increased social contact, through group participation, may improve social relating modifying relationships with voices (Birchwood et al., 2004). On a

broader level, groups may enable the development of nonfamily friendships which may further improve likelihood of recovery (Corrigan & Phelan, 2004).

Peer support is considered in the treatment of psychotic disorders (NICE, 2014). Despite the value peer support may offer (Mahlke et al., 2017) none of the included studies in this review involved peer support workers. Drawing from the hearing voice network (Romme & Escher, 1989) and in line with the recovery model (Slade et al., 2014), there may be added values in including peers as group facilitators. For example, they may prove more validating to members and be better positioned as group facilitators to encourage a shared understanding of AVH (Dillon & Hornstein, 2013).

In the included articles, the majority of group members were male, perhaps a reflection of gender-differences found in schizophrenia (McGrath, 2005). There may be added value in confining groups to same-sex. Voice hearing is increasingly recognised as a relationship (Hayward, 2003) and gender differences in voice relating have been found. Female voice hearers respond with greater resistance and distress and perceive their voices as more powerful and malevolent than males (Hayward, Slater, Berry, & Perona-Garcelán, 2016). Therefore, the use of gender specific groups may further increase 'universality' (Yalom & Leszcz, 2005). Furthermore, female gender is associated with greater improvement in psychological therapies. Reasons for this include being less emotionally blunted and being better at forming relationships (Brabban, Tai, & Turkington, 2009), attributions which seem particularly fitting to group settings.

We also consider whether group work maybe a useful 'springboard' to individual therapy. The development of therapeutic relationships, the introduction of

psychoeducative materials and the examination between thoughts, feelings and behaviours, may set up group members for individualised therapy. This may enhance 'readiness' and reduce overall time in individual treatment (Macrodimitris, Hamilton, Backs-Dermott, & Mothersill, 2010). A related benefit is that it may also facilitate greater self-reflectiveness and improve insight, two predictors of successful outcomes in CBT (O'Keeffe, Conway, & McGuire, 2017). At present, there is limited evidence to support the view that group therapy is a useful 'springboard' to individual treatment. Future research could investigate whether group therapy enhances readiness for individual therapy (Macrodimitris et al., 2010) and as a result, increases likelihood of positive treatment outcomes.

Limitations

Although this review updated previous articles and to our knowledge, is the first attempt to quantitatively assess the effects group therapy have on AVH within a schizophrenia sample, there are several limitations. Our focus was on quantitative AVH outcomes at posttreatment and therefore our review is unable to comment on proposed mechanisms of change. There is a need to identify processes which lead to a good outcome to ensure more effective treatments (Strauss et al., 2015). Two studies explicitly explored this (Ruddle et al., 2014; Wykes et al., 1999) and results suggest that beliefs about voices mediates change in distress. The identification of 'active ingredients' (Craig et al., 2013) may prove even more difficult to identify in group formats due to the existence of non-specific processes, which have been found to have a positive effect on clinical symptoms (Orfanos et al., 2015).

A further limitation was the choice of outcome selected for meta-analytic review. The choice to select symptom severity was both theoretically and pragmatically driven; meta-analysis should only be conducted if outcomes share

similar characteristics (Orfanos et al., 2015). The selection of symptom severity measures proved a practical way of grouping together results from a range of trials. However as outlined above, symptom-severity measures do not capture the intended outcomes of psychological treatments (ie., reduction in voice related distress). Therefore, the results of the quantitative review are only applicable to this indirect measure of treatment efficacy (Louise et al., 2017). In line, we may have missed other key benefits of group therapy such as increased social contact and improved functioning and quality of life (Segredou et al., 2012). In addition, we measured group acceptability indirectly through treatment dropout numbers. Inclusion of satisfaction measures may be better placed to offer an account of group acceptability in addition to qualitative studies.

Our decision to ensure sample homogeneity and quantitatively evaluate AVH outcomes meant that only a limited number of approaches are presented in this review. For instance, despite the popularity of the hearing voice network no studies from this approach met our inclusion criteria. There is a small but growing evidence base for peer-led interventions. It is likely that with improved controlled studies such approaches will soon provide greater empirical evidence as-well-as an insight into the mechanisms underpinning change (Beavan et al., 2017). Finally, the quality assessment of studies was conducted by the first author. Conventionally this is achieved by at least two authors. However, where trials have been reviewed in this review and in others using the CTAM (Louise et al., 2017; Wykes et al., 2008; van der Gaag & Valmaggia, 2014) ratings are consistent.

Conclusion

In sum, there is not strong evidence supporting group therapy in reducing AVH symptoms. However, psychological therapies are not neuroleptics (Birchwood

& Trower, 2006) but instead target voice related distress where the findings are more encouraging. Further research is needed to assess whether these encouraging findings can be replicated in larger, more methodological rigorous trials before definitive conclusions on the effects group therapy has on AVH can be drawn.

References

References marked with an asterisk indicate studies included in the meta-analysis.

American Psychiatric Association. (2000). *Diagnostic and statistical manual, 4th edn, Text Revision (DSM-IV-TR).* Washington: American Psychiatric Association.

Beavan, V., de Jager, A., & dos Santos, B. (2017). Do peer-support groups for voice-hearers work? A small scale study of Hearing Voices Network support groups in Australia. *Psychosis, 9*(1), 57-66.

Birchwood, M., Gilbert, P., Gilbert, J., Trower, P., Meaden, A., Hay, J., ... & Miles, J. N. (2004). Interpersonal and role-related schema influence the relationship with the dominant 'voice' in schizophrenia: a comparison of three models. *Psychological Medicine, 34*(8), 1571-1580.

Birchwood, M., Meaden, A., Trower, P., Gilbert, P., & Plaistow, J. (2000). The power and omnipotence of voices: subordination and entrapment by voices and significant others. *Psychological Medicine, 30*(2), 337-344.

Birchwood, M., Michail, M., Meaden, A., Tarrier, N., Lewis, S., Wykes, T., ... & Peters, E. (2014). Cognitive behaviour therapy to prevent harmful compliance with command hallucinations (COMMAND): a randomised controlled trial. *The Lancet Psychiatry, 1*(1), 23-33.

Birchwood, M., & Trower, P. (2006). The future of cognitive–behavioural therapy for psychosis: not a quasi-neuroleptic. *British Journal of Psychiatry, 188*, 107-108.

Borras, L., Boucherie, M., Mohr, S., Lecomte, T., Perroud, N., & Huguelet, P. (2009). Increasing self-esteem: efficacy of a group intervention for individuals with severe mental disorders. *European Psychiatry*, *24*(5), 307-316.

Brabban, A., Tai, S., & Turkington, D. (2009). Predictors of outcome in brief cognitive behavior therapy for schizophrenia. *Schizophrenia Bulletin*, *35*(5), 859-864.

Buccheri, R., Trygstad, L., & Dowling, G. (2007). Behavioral management of command hallucinations to harm in schizophrenia. *Journal of Psychosocial Nursing and Mental Health Services*, *45*(9), 46-54.

Buccheri, R., Trygstad, L., Dowling, G., Hopkins, R., White, K., Griffin, J. J., ... & Covert, C. (2004). Long-term effects of teaching behavioral strategies for managing persistent auditory hallucinations in schizophrenia. *Journal of Psychosocial Nursing and Mental Health Services*, *42*(1), 18-27.

Burns, A. M., Erickson, D. H., & Brenner, C. A. (2014). Cognitive-behavioral therapy for medication-resistant psychosis: a meta-analytic review. *Psychiatric Services*, *65*(7), 874-880.

Chadwick, P, & Birchwood, M. (1995). The omnipotence of voices. II: The Beliefs About Voices Questionnaire (BAVQ). *The British Journal of Psychiatry*, *166*(6), 773-776.

*Chadwick, P., Hughes, S., Russell, D., Russell, I., & Dagnan, D. (2009). Mindfulness groups for distressing voices and paranoia: a replication and randomized feasibility trial. *Behavioural and Cognitive Psychotherapy*, *37*(04), 403- 412.

Chadwick, P., Lees, S., & Birchwood, M. (2000). The revised beliefs about voices questionnaire (BAVQ-R). *The British Journal of Psychiatry*, *177*(3), 229-232.

Chadwick, P., Sambrooke, S., Rasch, S., & Davies, E. (2000). Challenging the omnipotence of voices: group cognitive behavior therapy for voices. *Behaviour Research and Therapy*, *38*(10), 993-1003.

*Chadwick, P., Strauss, C., Jones, A. M., Kingdon, D., Ellett, L., Dannahy, L., & Hayward, M. (2016). Group mindfulness-based intervention for distressing voices: a pragmatic randomised controlled trial. *Schizophrenia Research*, *175*(1), 168-173.

Chung, Y. C., Yoon, K. S., Park, T. W., Yang, J. C., & Oh, K. Y. (2013). Group cognitive-behavioral therapy for early psychosis. *Cognitive Therapy and Research*, *37*(2), 403-411.

Cohen, J. (1992). A power primer. *Psychological bulletin*, *112*(1), 155.

Corrigan, P. W., & Phelan, S. M. (2004). Social support and recovery in people with serious mental illnesses. *Community Mental Health Journal*, *40*(6), 513-523.

Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., & Petticrew, M. (2008). Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ*, *337*, a1655.

Dannahy, L., Hayward, M., Strauss, C., Turton, W., Harding, E., & Chadwick, P. (2011). Group person-based cognitive therapy for distressing voices: pilot data from nine groups. *Journal of Behavior Therapy and Experimental Psychiatry*, *42*(1), 111-116.

Dillon, J., & Hornstein, G. A. (2013). Hearing voices peer support groups: a powerful alternative for people in distress. *Psychosis*, *5*(3), 286-295.

Dos Santos, B., & Beavan, V. (2015). Qualitatively exploring hearing voices network support groups. *The Journal of Mental Health Training, Education, and Practice*, *10*(1), 26.

Fernandez, E., Salem, D., Swift, J. K., & Ramtahal, N. (2015). Meta-analysis of dropout from cognitive behavioral therapy: Magnitude, timing, and moderators. *Journal of Consulting and Clinical Psychology*, *83*(6), 1108-1122.

Field, A. P., & Gillett, R. (2010). How to do a meta-analysis. *British Journal of Mathematical and Statistical Psychology*, *63*(3), 665-694.

Freeman, D., & Garety, P. (2014). Advances in understanding and treating persecutory delusions: a review. *Social Psychiatry and Psychiatric Epidemiology*, *49*(8), 1179-1189.

Gayer-Anderson, C., & Morgan, C. (2013). Social networks, support and early psychosis: a systematic review. *Epidemiology and Psychiatric Sciences*, *22*(02), 131-146.

Gledhill, A., Lobban, F., & Sellwood, W. (1998). Group CBT for people with schizophrenia: a preliminary evaluation. *Behavioural and Cognitive Psychotherapy*, *26*(01), 63-75.

Haddock, G., McCarron, J., Tarrier, N., & Faragher, E. B. (1999). Scales to measure dimensions of hallucinations and delusions: the psychotic symptom rating scales (PSYRATS). *Psychological Medicine*, *29*(4), 879-889.

Hayward, M. (2003). Interpersonal relating and voice hearing: to what extent does relating to the voice reflect social relating? *Psychology and Psychotherapy: Theory, Research and Practice*, *76*(4), 369-383.

Hayward, M., Denney, J., Vaughan, S., & Fowler, D. (2008). The voice and you: development and psychometric evaluation of a measure of relationships with voices. *Clinical Psychology & Psychotherapy*, *15*(1), 45-52.

Hayward, M., Slater, L., Berry, K., & Perona-Garcelán, S. (2016). Establishing the "Fit" between the Patient and the Therapy: The Role of Patient Gender in Selecting Psychological Therapy for Distressing Voices. *Frontiers in Psychology*, *7*, 1-9.

Hazell, C. M., Hayward, M., Cavanagh, K., & Strauss, C. (2016). A systematic review and meta-analysis of low intensity CBT for psychosis. *Clinical Psychology Review*, *45*, 183-192.

Higgins, J. P., & Green, S. (Eds.). (2011). *Cochrane handbook for systematic reviews of interventions* (Vol. 4). Chichester: John Wiley & Sons.

Higgins, J. P., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *BMJ: British Medical Journal*, *327*(7414), 557.

Hirsch, L., Yang, J., Bresee, L., Jette, N., Patten, S., & Pringsheim, T. (2017). Second-Generation Antipsychotics and Metabolic Side Effects: A Systematic Review of Population-Based Studies. *Drug Safety*, 1-11.

Hustig, H. H., & Hafner, R. J. (1990). Persistent auditory hallucinations and their relationship to delusions and mood. *The Journal of Nervous and Mental Disease, 178*(4), 264-267.

Jauhar, S., McKenna, P. J., Radua, J., Fung, E., Salvador, R., & Laws, K. R. (2014). Cognitive-behavioural therapy for the symptoms of schizophrenia: systematic review and meta-analysis with examination of potential bias. *The British Journal of Psychiatry*, *204*(1), 20-29.

Kane, J. M. (1996). Treatment-resistant schizophrenic patients. *The Journal of Clinical Psychiatry*, *57*, 35-40.

Kay, S. R., Fiszbein, A., & Opfer, L. A. (1987). The positive and negative syndrome scale (PANSS) for schizophrenia. *Schizophrenia Bulletin*, *13*(2), 261.

Krawiecka, M., Goldberg, D., & Vaughan, M. (1977). A standardized psychiatric assessment scale for rating chronic psychotic patients. *Acta Psychiatrica Scandinavica*, *55*(4), 299-308.

Lecomte, T., Leclerc, C., Corbiere, M., Wykes, T., Wallace, C. J., & Spidel, A. (2008). Group Cognitive Behavior Therapy or Social Skills Training for Individuals With a Recent Onset of Psychosis? Results of a Randomized Controlled Trial. *The Journal of Nervous and Mental Disease*, *196*(12), 866-875.

Lecomte, T., Leclerc, C., & Wykes, T. (2012). Group CBT for early psychosis—are there still benefits one year later? *International Journal of Group Psychotherapy*, *62*(2), 309-321.

Lieberman, J. A., Stroup, T. S., McEvoy, J. P., Swartz, M. S., Rosenheck, R. A., Perkins, D. O., ... & Severe, J. (2005). Effectiveness of antipsychotic drugs in patients with chronic schizophrenia. *New England Journal of Medicine*, *2005*(353), 1209- 1223.

Louise, S., Fitzpatrick, M., Strauss, C., Rossell, S. L., & Thomas, N. (2017). Mindfulness-and acceptance-based interventions for psychosis: Our current understanding and a meta-analysis. *Schizophrenia Research*.

Macrodimitris, S. D., Hamilton, K. E., Backs-Dermott, B. J., & Mothersill, K. J. (2010). CBT basics: A group approach to teaching fundamental cognitive-behavioral skills. *Journal of Cognitive Psychotherapy*, *24*(2), 132-146.

Mahlke, C. I., Priebe, S., Heumann, K., Daubmann, A., Wegscheider, K., & Bock, T. (2017). Effectiveness of one-to-one peer support for patients with severe mental illness–a randomised controlled trial. *European Psychiatry*, *42*, 103-110.

Marshall, M., Lockwood, A., Bradley, C., Adams, C., Joy, C., & Fenton, M. (2000). Unpublished rating scales: a major source of bias in randomised controlled trials of treatments for schizophrenia. *The British Journal of Psychiatry*, *176*(3), 249-252.

McLeod, T., Morris, M., Birchwood, M., & Dovey, A. (2007). Cognitive behavioural therapy group work with voice hearers. Part 1. *British Journal of Nursing*, *16*(4), 248-258.

*McLeod, T., Morris, M., Birchwood, M., & Dovey, A. (2007). Cognitive behavioural therapy group work with voice hearers. Part 2. *British Journal of Nursing*, *16*(5), 292-295.

Mitchell, J., & Vierkant, A. D. (1991). Delusions and hallucinations of cocaine abusers and paranoid schizophrenics: a comparative study. *The Journal of Psychology*, *125*(3), 301-310.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Medicine*, *6*(7), e1000097.

Moritz, S., Kerstan, A., Veckenstedt, R., Randjbar, S., Vitzthum, F., Schmidt, C., ... & Woodward, T. S. (2011). Further evidence for the efficacy of a metacognitive group training in schizophrenia. *Behaviour Research and Therapy*, *49*(3), 151-157.

*Moritz, S., Veckenstedt, R., Bohn, F., Hottenrott, B., Scheu, F., Randjbar, S., ... & Andreou, C. (2013). Complementary group Metacognitive Training (MCT) reduces delusional ideation in schizophrenia. *Schizophrenia Research*, *151*(1), 61-69.

Mortan, P. O., Sutcu, P. S. T., & Kose, P. G. G. (2011). A pilot study on the effectiveness of a group-based cognitive-behavioral therapy program for coping with auditory hallucinations. *Turk Psikiyatri Dergisi*, *22*(1), 26.

National Institute for Heath and Care Excellence. (2014). *Psychosis and schizophrenia in adults: Treatment and management*. London: National Institute for Heath and Care Excellence.

Oakland, L., & Berry, K. (2015). “Lifting the veil”: a qualitative analysis of experiences in Hearing Voices Network groups. *Psychosis*, *7*(2), 119-129.

O'Keeffe, J., Conway, R., & McGuire, B. (2017). A systematic review examining factors predicting favourable outcome in cognitive behavioural interventions for psychosis. *Schizophrenia Research*, *183*, 22-30.

Orfanos, S., Banks, C., & Priebe, S. (2015). Are group psychotherapeutic treatments effective for patients with schizophrenia? A systematic review and meta-analysis. *Psychotherapy and Psychosomatics*, *84*(4), 241-249.

Payne, T., Allen, J., & Lavender, T. (2017). Hearing Voices Network groups: experiences of eight voice hearers and the connection to group processes and recovery. *Psychosis*, 1-11.

*Penn, D. L., Meyer, P. S., Evans, E., Wirth, R. J., Cai, K., & Burchinal, M. (2009). A randomized controlled trial of group cognitive-behavioral therapy vs. enhanced supportive therapy for auditory hallucinations. *Schizophrenia Research*, *109*(1), 52-59.

Pinkham, A. E., Gloege, A. T., Flanagan, S., & Penn, D. L. (2005). Group cognitive-behavioral therapy for auditory hallucinations: A pilot study. *Cognitive and Behavioral Practice*, *11*(1), 93-98.

Review Manager (RevMan) [Computer program]. Version 5.3. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2014.

Romme, M. A., & Escher, A. D. (1989). Hearing voices. *Schizophrenia Bulletin*, *15*(2), 209.

Ruddle, A., Livingstone, S., Huddy, V., Johns, L., Stahl, D., & Wykes, T. (2014). A case series exploring possible predictors and mechanisms of change in

hearing voices groups. *Psychology and Psychotherapy: Theory, Research and Practice*, *87*(1), 60-79.

Ruddle, A., Mason, O., & Wykes, T. (2011). A review of hearing voices groups: Evidence and mechanisms of change. *Clinical Psychology Review*, *31*(5), 757-766.

Schizophrenia Commission. (2012). The abandoned illness: a report from the Schizophrenia Commission. *London: Rethink Mental Illness*.

Segredou, I., Xenitidis, K., Panagiotopoulou, M., Bochtsou, V., Antoniadou, O., & Livaditis, M. (2012). Group psychosocial interventions for adults with schizophrenia and bipolar illness: The evidence base in the light of publications between 1986 and 2006. *International Journal of Social Psychiatry*, *58*(3), 229-238.

Shergill, S. S., Murray, R. M., & McGuire, P. K. (1998). Auditory hallucinations: a review of psychological treatments. *Schizophrenia Research*, *32*(3), 137-150.

Slade, M., Amering, M., Farkas, M., Hamilton, B., O'Hagan, M., Panther, G., ... & Whitley, R. (2014). Uses and abuses of recovery: implementing recovery-oriented practices in mental health systems. *World Psychiatry*, *13*(1), 12-20.

Steel, C., Garety, P. A., Freeman, D., Craig, E., Kuipers, E., Bebbington, P., ... & Dunn, G. (2007). The multidimensional measurement of the positive symptoms of psychosis. *International Journal of Methods in Psychiatric Research*, *16*(2), 88-96.

Strauss, C., Thomas, N., & Hayward, M. (2015). Can we respond mindfully to distressing voices? A systematic review of evidence for engagement,

acceptability, effectiveness and mechanisms of change for mindfulness-based interventions for people distressed by hearing voices. *Frontiers in Psychology*, *6*, 1-12.

Takeshima, N., Sozu, T., Tajika, A., Ogawa, Y., Hayasaka, Y., & Furukawa, T. A. (2014). Which is more generalizable, powerful and interpretable in meta-analyses, mean difference or standardized mean difference? *BMC Medical Research Methodology*, *14*(1), 30.

Tarrier, N., & Wykes, T. (2004). Is there evidence that cognitive behaviour therapy is an effective treatment for schizophrenia? A cautious or cautionary tale? *Behaviour Research and Therapy*, *42*(12), 1377-1401.

Thomas, N., Hayward, M., Peters, E., van der Gaag, M., Bentall, R. P., Jenner, J., ... & García-Montes, J. M. (2014). Psychological therapies for auditory hallucinations (voices): current status and key directions for future research. *Schizophrenia Bulletin*, *40*(Suppl_4), S202-S212.

Trygstad, L., Buccheri, R., Dowling, G., Zind, R., White, K., Griffin, J. J., ... & Covert, C. (2002). Behavioral management of persistent auditory hallucinations in schizophrenia: Outcomes from a 10-week course. *Journal of the American Psychiatric Nurses Association*, *8*(3), 84-91.

Tschoeke, S., Steinert, T., Flammer, E., & Uhlmann, C. (2014). Similarities and differences in borderline personality disorder and schizophrenia with voice hearing. *The Journal of Nervous and Mental Disease*, *202*(7), 544-549.

van der Gaag, M., Valmaggia, L. R., & Smit, F. (2014). The effects of individually tailored formulation-based cognitive behavioural therapy in auditory

hallucinations and delusions: a meta- analysis. *Schizophrenia Research*, *156*(1), 30-37.

Ventura, J., Green, M. F., Shaner, A., & Liberman, R. P. (1993). Training and quality assurance with the Brief Psychiatric Rating Scale:" The drift busters.". *International Journal of Methods in Psychiatric Research*.

Waters, F., & Fernyhough, C. (2017). Hallucinations: a systematic review of points of similarity and difference across diagnostic classes. *Schizophrenia Bulletin*, *43*(1), 32-43.

World Health Organization. (1992). *The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines*. Geneva: World Health Organization.

*Wykes, T., Hayward, P., Thomas, N., Green, N., Surguladze, S., Fannon, D., & Landau, S. (2005). What are the effects of group cognitive behaviour therapy for voices? A randomised control trial. *Schizophrenia Research*, *77*(2), 201-210.

Wykes, T., Parr, A. M., & Landau, S. (1999). Group treatment of auditory hallucinations. Exploratory study of effectiveness. *The British Journal of Psychiatry*, *175*(2), 180-185.

Wykes, T., Steel, C., Everitt, B., & Tarrier, N. (2008). Cognitive behavior therapy for schizophrenia: effect sizes, clinical models, and methodological rigor. *Schizophrenia Bulletin*, *34*(3), 523-537.

Yalom, I. D, & Leszcz, M. (1995). *The theory and practice of group psychotherapy*. New York: Basic Books.

Zanello, A., Mohr, S., Merlo, M. C., Huguelet, P., & Rey-Bellet, P. (2014). Effectiveness of a brief group cognitive behavioral therapy for auditory verbal hallucinations: a 6-month follow-up study. *The Journal of Nervous and Mental Disease*, *202*(2), 144-153.

Zimmermann, G., Favrod, J., Trieu, V. H., & Pomini, V. (2005). The effect of cognitive behavioral treatment on the positive symptoms of schizophrenia spectrum disorders: a meta-analysis. *Schizophrenia Research*, *77*(1), 1-9.

Part II: Empirical Paper

Observed Relating Behaviours between Voice Hearers and Their Persecutory Voice during AVATAR Therapy Dialogue

Abstract

Aims:

AVATAR therapy offers a novel relational approach in targeting distressing voices. This study aimed to: 1) map *Relating Behaviours* between participants and a visual representation of their persecutory voice – avatar – over the course of therapy and; 2) examine *Therapeutic Techniques* delivered within AVATAR therapy dialogue.

Method:

Twenty-five AVATAR therapy completers were randomly selected for inclusion in this study. A developed coding frame enabled a fined grained analysis of observed relating behaviours and therapeutic techniques over the course of AVATAR therapy dialogue.

Results:

There were significant changes in the relating behaviours of both participants and avatars during therapy. Descriptive data provides an insight into the therapeutic techniques delivered within AVATAR therapy dialogue.

Conclusion:

The findings support the conceptualising of voice hearing as an interpersonal experience, suggest that hearers' relating behaviours to distressing voices are amenable to change and indicates that the intended techniques of AVATAR therapy are implemented during therapy dialogue.

Introduction

Voices, also referred to as auditory verbal hallucinations (AVH), are the most common form of hallucination with lifetime prevalence rates among individuals with schizophrenia ranging from 60% (Slade & Bentall, 1988) to 74% (Wing, Cooper, & Sartorius, 1974). AVH are defined as subjective experiences within the auditory modality in the absence of external stimuli (Woods et al., 2014). They can cause considerable functional impairment, intolerable distress and contribute to elevated rates of suicide in treatment refractory voice hearers (Leff, Williams, Huckvale, Arbuthnot, & Leff, 2013).

Psychological Theories of AVH

Cognitive Models

The cognitive model of AVH holds that the presence of AVH are not sufficient - in and of itself - to determine clinical distress and need for care (Morrison & Barratt, 2010). Indeed, the phenomenology of AVH have found to be similar in both ‘healthy’ and ‘need for care’ hearers (Baumeister, Sedgwick, Howes, & Peters, 2017). Rather, the cognitive model proposes that it is appraisal and beliefs, such as whether they are externally caused and personally significant, about AVH that determine affective disturbances (Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001). Chadwick and Birchwood (1994) seminal work offered support in linking AVH beliefs (identity, power and intent) to distress and behavioural responses. Consistent with the cognitive model was the finding that individuals who believed their AVH to be malevolent reported greater distress and resisted engagement. In comparison, those who offered benevolent accounts courted their AVH (Chadwick & Birchwood, 1994).

Expanding on cognitive conceptualisations of anxiety disorders, Morrison's (1998) account similarly places mean making at the model's centre. It proposes that internal stimuli such as intrusive thoughts are misinterpreted as unacceptable and misattributed to external sources. The appraisals of these intrusions are influenced by experience and beliefs about the self, world and others (Morrison, 2001). Mood (e.g., anxiety) and physiological reactions (e.g., sleep problems) as-well-as cognitive and behavioural responses, such as selective attention and avoidance respectively, perpetuate AVH and associated distress.

Interpersonal Models

Benjamin (1989) conceptualised AVH as an interpersonal experience where hearers develop a coherent relationship with their voices. She posited that social interactions are governed by a series of complementarity interactive patterns of relating. The structural analysis of social behaviour (Benjamin, 1974; SASB) model displays 72 interactions around complementary planes. These are divided by a horizontal axis delineating degree of affiliation and a vertical axis indicating interdependence. Each behaviour is hypothesised to elicit its reciprocal behaviour. For example, controlling behaviours are thought to activate submissive responses. It was theorised that these complementarity roles were similar to relating behaviours observed between people with schizophrenia and their AVH (Benjamin, 1989). The account can offer an explanation for Chadwick and Birchwood's (1994) findings that malevolent voices were resisted and benevolent voices courted. However, Thomas, McLeod and Brewin (2009) provide only mixed support for interpersonal complementarity in voice hearing. Hostile voices predicted hostile reciprocal responses, although voice control only weakly predicted hearer submissiveness. The authors' interpretation of this unexpected finding was that submissive responses are

not determined only by voice control but moderated by appraisals about voices and own perceived social standing.

Evolutionary psychology has informed further developments. Social rank theory (Gilbert & Allan, 1994) proposes that mental mechanisms and in particular, the recognition of social rank, have evolved to ensure survival. In socially ranked relationships, hostile-dominant behaviours maintain hierarchy, forcing subordinates to flight, freeze or appease. The authors applied the theory to the experience of distressing AVH and found that malevolent voice hearers engage in subordinate defensive strategies (e.g., flight). Further work (Birchwood et al., 2004) has shown that the power differential commonly found between hearer and voices is influenced by underlining social schemata, perceived social rank (i.e., see self as being of lower social rank) and mirrored in other external patterns of relating.

A final addition to the interpersonal understanding of AVH was the inclusion of proximity and intimacy (Hayward, 2003). According to Birtchnell's (1996) theory, relating has two components: power, which describes the amount of influence one has over another (similar to social rank dominant-subordinate interactions) and proximity, the distance and by extension, intimacy between two people. The interpersonal octagon (Birtchnell, 1996) illustrates eight different ways of relating. The vertical axis (power) has upper - lower at either end. The horizontal axis (proximity), distance-closeness at either pole. Competent individuals can navigate and vary their ways of relating to the demands of a situation. It is conjectured that these individuals would likely to have experienced successful social relationships. On the other hand, those who have had few positive social relationships are likely to only to be able to occupy a few positions of relating, limiting success in varying social situations (Hayward, Berry, & Ashton, 2011). There has been consistent

support for the application of relating theory in voice hearing. In summary, individuals who experience distressing AVH display submissive and intrusive relationships with their AVH, a relating pattern mirrored in social relationships (Hayward, 2003).

The Role of Childhood Trauma

The relationship between early childhood trauma and increased risk of psychosis is well established (Read, van Os, Morrison, & Ross, 2005; Varese et al., 2012). Although evidence for the mechanisms of how early childhood trauma leads to psychosis have been inconclusive, such as limited evidence supporting a specificity model between childhood sexual abuse and AVH (Longden, Sampson, & Read, 2016), several biopsychosocial pathways linking trauma to psychosis have been proposed.

Early trauma has been implicated in increased dopamine reactivity, a neurotransmitter linked to psychotic experiences (van Os, Kenis, & Rutten, 2010). The traumagenic neurodevelopmental model (Read, Perry, Moskowitz, & Connolly, 2001) suggests that early prolonged trauma can heighten sensitivity to stress even in individuals without a genetic vulnerability. It therefore proposes that it can cause the vulnerability in the stress-vulnerability model of psychosis (Read et al., 2005).

Within a cognitive framework (Garety et al., 2001), early trauma leads to an enduring vulnerability through the formation of negative schemata about the self (e.g., perceive self as vulnerable), others (e.g., perceive others as threatening) and the world (e.g., perceive world as dangerous). These cognitive representations can in turn lower self-esteem and perceived subordination, influencing appraisals about

voices such as their malevolence, benevolence and omnipotence (Birchwood, Meaden, Trower, Gilbert, & Plaistow, 2000).

Early trauma may disrupt healthy attachment increasing risk of psychopathology in adult life. Consistent with this is the observation that people with psychosis have experienced higher rates of potentially attachment threatening events, such as unwanted pregnancy and early parental loss (Morgan et al., 2007). Disrupted attachment may increase risk through various pathways including mood instability (Marwaha, Broome, Bebbington, Kuipers, & Freeman, 2014), affect dysregulation (Gajwani, Patterson, & Birchwood, 2013) and social isolation/few peer relationships (Read & Gumley, 2008). Regarding AVH, individual's relationship to AVH have been found to reflect early traumatic childhood affiliations (Connor & Birchwood, 2012). Attachment anxiety has been shown to be associated with voice severity and distress (Berry, Wearden, Barrowclough, Oakland, & Bradley, 2012) and attachment avoidance with voice dominance and hearer distance (Robson & Mason, 2015). Lastly, mentalisation – the ability to think about one's own mental states and others (Bateman & Fonagy, 1997) – is found to be impaired in people with schizophrenia (Brent & Fonagy, 2014) and its development is associated with quality of attachment (Fonagy & Target, 1997).

Psychological Therapies for AVH

With a shift towards symptom–specific approaches (Bentall, 2006) there has been a burgeoning of psychological therapies targeting distressing AVH. Following the tenets of cognitive models, cognitive behavioural therapy for psychosis works at the meaning level in that beliefs and appraisals are challenged to reduce distress and improve functioning (Thomas et al., 2014). For example, cognitive therapy for command AVH aims to modify beliefs about voice power and control (Trower,

Birchwood, Meaden, Byrne, Nelson, & Ross, 2004). Their randomised controlled trial (RCT; Birchwood et al., 2014) reported reduced compliance and a reduction in perceived voice power following intervention. Similarly, relating therapy (Hayward, Overton, Dorey, & Denney, 2009) focuses on re-balancing power and proximity by improving hearer assertiveness. A case-series (Hayward et al., 2009) has indicated that the approach is acceptable to individuals and successful in improving AVH relating. A pilot RCT also found large effect sizes in the reduction of AVH distress in favour of relating therapy over treatment as usual (Hayward, Jones, Bogen-Johnston, Thomas, & Strauss, 2016).

AVATAR Therapy

AVATAR therapy (Leff et al., 2013) offers a novel relational approach in targeting distressing AVH. It incorporates aspects of cognitive approaches (Chadwick & Birchwood, 1994; Morrison, 2001) in that it challenges beliefs about voices, and interpersonal approaches (Birchwood et al., 2014; Hayward et al., 2009) in that it aims to modify hearer relating.

The therapy involves computer technology which is used to develop a visual representation of an individual's dominant persecutory voice – an 'avatar'. During therapy, the therapist promotes dialogue between participant and the avatar (which the therapist voices). Over this time the avatar progressively becomes less controlling and dominating, permitting greater participant autonomy. In essence, the avatar moves from a malevolent figure to more of an ally. As the sessions proceed, the role of the therapist and avatar merges, with the once hostile avatar transitioning to something more akin to a therapist (Leff, Williams, Huckvale, Arbuthnot, & Leff, 2014). A pilot study (Leff et al., 2013) yielded promising findings, with significant

reductions in AVH frequency and associated distress. The clinical efficacy of the approach is being assessed in a large RCT (Craig et al., 2015a).

The AVATAR therapy researchers put forward three related mechanisms of change (Craig et al., 2015a). During the initial phase of therapy, the participant is encouraged (thorough direct therapist input) to become more assertive and with this the avatar becomes less controlling. The next phase promotes participant self-esteem and the development of a more positive self-identity. A final mechanism of treatment (which occurs throughout) is the reduction in associated anxiety through exposure to the visual avatar and content of voice.

Analysing Psychological Therapies

Psychological therapies for psychosis share a commonality in that they tend to be complex interventions encompassing a number of techniques (Dunn et al., 2012). For instance, in one Delphi study (Morrison & Barratt, 2010) a panel of experts in the field of psychosis identified 77 items as important or essential for CBT for psychosis. The identification of 'active ingredients' of an intervention informs how the intervention works (Craig et al., 2013) and can provide an account on the targeted mechanisms of change (Rollinson et al., 2007). AVATAR therapy is a complex package of techniques delivered in a novel setting. A key part of its development and understanding of the mechanisms of change (as is the case with any manualised form of therapy) will be assessing whether treatment techniques – as outlined by Craig et al. (2015a) – are applied as intended (Onwumere et al., 2009).

Research Objectives and Hypotheses

This study uses data from the AVATAR RCT (Craig et al., 2015a) and aims to map relating behaviours between participant and the avatar over the course of

therapy. Descriptive analysis will provide a detailed account on the specific changes in relating styles, of both participants and avatars, observed during voice dialogue. This study will also evaluate the specific observed therapeutic approaches implemented by the therapist and the voiced avatar during therapy to achieve its intended aims. Therefore, this study represents a novel development on two fronts: specific relating behaviours are captured in 'real time' dialogue between participants and their dominant persecutory voice; the proposed AVATAR therapeutic techniques delivered to target mechanisms of change are inspected. Finally, given the high number of trauma histories in people with distressing AVH (Daalman et al., 2012), additional analysis will assess associations between social adversity and participant relating behaviours.

The study had the following objectives and hypotheses:

1) **To investigate observed *Relating Behaviours* between participant and avatar over the course of therapy.**

Study Hypotheses:

Hypothesis 1: There will be a reduction in observed avatar controlling behaviours over the course of therapy.

Hypothesis 2: There will be an increase in observed avatar autonomy giving behaviours over the course of therapy.

Hypothesis 3: There will be a reduction in observed participant submissiveness over the course of therapy.

Hypothesis 4: There will be an increase in observed participant assertiveness over the course of therapy.

2) **To investigate observed *Therapeutic Techniques* implemented over the course of therapy.**

Study Hypothesis:

Hypothesis 5: There will be a reduction in therapist promoting assertive responding techniques over the course of therapy.

3) **Exploratory analyses will be conducted to investigate whether social adversity, conceptualised here as early childhood trauma and low/unsatisfactory social support, influence participant relating behaviours during therapy.**

Method

Participants

Participants of this study were a sub-set of those recruited to the AVATAR trial. The inclusion criteria for the trial is detailed in Craig et al. (2015a) and is as follows: 1) over 18 years old; 2) have experienced distressing AVH for at least 12 months; 3) primary diagnosis of non-organic psychosis (including *International Classification of Diseases* (ICD)-10 categories F20-29 and F30-39, subcategories with psychotic symptoms). Exclusion criteria was as follows: 1) unable to give informed consent; 2) in receipt of cognitive behaviour therapy for psychosis or attending a group specific to hearing voices; 3) unable to identify a single dominant voice to work on; 4) refusing all medication; 5) a diagnosis of organic brain disease; 6) a primary substance dependency; 7) AVH in a language not spoken by the therapists; 8) a command of spoken English inadequate for engaging in therapy; 9) inability to tolerate the assessment process.

A total of 150 participants were recruited to the AVATAR RCT. Most participants (n=93) were recruited from the South London and Maudsley National Health Service (NHS) Foundation Trust. The remaining participants were recruited from other NHS trusts within the United Kingdom. Seventy-five participants were randomised to AVATAR therapy. Of these, 53 completed AVATAR therapy. 'Completers' were defined as those who attended at least six therapy sessions. For this study, 25 'completers' were randomly selected for investigation. The decision to select 25 participants was due to practical reasons (i.e., time and resources) and power calculations (as outlined below).

Ethics

King's College London was the research Sponsor. The study has been reviewed and approved by the London Hampstead Research Ethics Committee: 13/Lo/0482). A research amendment was granted to cover this project (Appendix 2).

Coding Frame

A coding frame was developed to fit the study's objectives and hypotheses. As advised (Heyman, Lorber, Eddy, & West, 2014), a significant amount of time was spent on observing the phenomena of interest (from pilot AVATAR therapy recordings) and reviewing relevant literature to guide development. No priori methodological plan was set, as is typical in the development of coding systems (Bakeman & Gottman, 1997). There were no discrete stages of development (apart from the analysis of interrater agreement which was the final stage of development). An iterative process with five main phases was instead followed:

1) Review of relevant theory and literature. Focus was primarily on cognitive and interpersonal theories and therapies of voice hearing as outlined in the introduction;
2) AVATAR therapy pilot recordings and the AVATAR therapy manual (Craig et al., 2015b) were both examined to inform coding development;
3) Developed codes were discussed in a consensus meeting with AVATAR therapists and principle investigators of the AVATAR RCT;
4) To ensure key themes and behaviours were captured, we followed Green et al. (2006) method where a sample of transcripts were selected and analysed. Categories were further refined and new codes added if necessary;
5) Transcripts were randomly selected to assess interrater agreement.

Codes

The developed framework consisted of codes formed across two types of interaction: 1) *Relating Behaviours* and 2) *Therapeutic Techniques*. Relating behaviours captured observed interpersonal behaviours between participant and avatar. Therapeutic techniques focused on the methods implemented by the therapist and voiced avatar. Each coded area of interaction (relating behaviours and therapeutic techniques) had two levels of coding. The macro level captured global constructs and the micro level captured specific behaviours. Coding manuals and instructions were developed (see below) to enhance coder objectivity and consistency.

1: Relating Behaviours

AVATAR therapy aims to change the relationship participants have with their distressing AVH (Craig et al., 2015a). A review of theory and assessment of AVATAR pilot work led to the development of four macro codes: *Controlling*, *Autonomy Giving*, *Submissiveness* and *Autonomy Asserting*. Each of these macro codes were formed by a number of micro codes. Please see Table 1 for the relating behavioural manual. Each micro code is presented with corresponding descriptors and verbatim examples.

Controlling

The controlling macro code drew from the observation that those who experience distressing AVH perceive their voice to be powerful, malevolent and of higher social rank (Birchwood et al., 2004). In addition, negative AVH content is common in schizophrenia samples (Beavan, & Read, 2010; Nayani & David, 1996). Therefore, behaviours that were dominant-hostile and/or with negative and derogatory content came under this category. Examples of controlling micro codes

include *demand* - defined as requesting another to act in accordance with request, and *threat (physical)* - a threat to the physical integrity of another.

Autonomy Giving

AVATAR therapy includes a negotiation of power away from avatar to participant (Craig, Ward & Rus-Calafell, 2016). Behaviours which contributed towards this shift were coded as autonomy giving. Examples of autonomy giving micro codes include *negotiate/move towards emancipation*. This is similar to emancipation in Benjamin's (1974) SASB model. Participant omnipotent beliefs about AVH (Chadwick & Birchwood, 1994) were challenged through avatar *concession of power*.

Submissiveness

We drew on social rank literature and in particular subordinate defensive responses observed in relating to distressing AVH (Gilbert et al., 2001). Interpersonal behaviours which displayed passivity and powerlessness were coded here. One item which was included was *ambivalence about ending relationship* with AVH. This was included as there may be some ambivalence of losing even a malevolent voice which an individual has built up a relationship with (Gilbert et al., 2001). Other submissive micro codes include, *appeasement* – a defensive response seen where one complies with a perceived dominant other (Gilbert et al., 2001) and *helplessness*, a micro code derived from 'poor me' beliefs (Trower & Chadwick, 1995).

Autonomy Asserting

The assertive phase is key to AVATAR therapy and shares similarities with other relating interventions (e.g., Hayward et al., 2009). Autonomy asserting behaviours reflect a change on the power and proximity dimensions (Birtchnell,

1996) in favour of the hearer. Autonomy asserting micro codes include *challenge/dismiss other's assertion* and *separate-distance*. The latter code was conceptualised as a more adaptive withdrawal (i.e., individual now confident and assertive enough to request other to leave) than hearer distance (sometimes referred to as separated) conceptualised by Hayward (2008).

Table 1: *Relating behaviours manual*

Macro Code	Micro Code *Description*	Example
Controlling	**Demand** *Instructs other to act in accordance with request.*	**"***You must take the drugs, you must take the sinsemilia."* [A]
	Threat (physical) *Threat of physical harm.*	*"I'm going to kill you tomorrow morning."* [A]
	Threat (psychological) *Threat of psychological harm.*	*"We're MI5. Of course we control everything anyway, whatever you do."* [A]
	Undermine (instil doubt) *To instil doubt in other and maintain dominance.*	**"***You don't sound very sure about yourself."* [A]
	Holding on/reluctance to change relationship style *Reluctance and resistance to change relationship dynamic.*	**"***But I need to be in your life".* [A]
	Abuse/insult/negative evaluation of other *Mocking, ridiculing, name calling. Subjugates other with ego dystonic comments.*	*"You're ugly and useless".* [A]
Autonomy Giving	**Advice giving** *One takes an 'expert position' and typically advises/mentors other.*	"*Well there you are then, you've figured it out yourself, you know what to do now, you can change and you can be a better person for that."* [P]
	Negotiate/move towards emancipation *A change in relationship which indicates a shift in relating style.*	**"***Well if you continue like this I will be fading form your life."* [A]
	Concession of power *Explicit acknowledgment that one is no longer as powerful and able to control.*	*"I see. Well if I'm honest I think you've already started to take control back from me."* [A]
	Acknowledgment of change *Acknowledges change at the individual level, relational level, or in terms of how other manages avatar/voices.*	**"***I think you are changing, you're accusing me".* [A]
	Intrigue (express positive surprise about change) *A positive surprised expression about change at the relational level.*	*"No but I can change my reaction to it."* [P] *…What do you mean?"* [A]

Submissiveness	**Speechless/hesitant** *One comes across as uncertain.*	*"Oh…em…"* [P]
	Helpless (inc. reliance on others) *Similar to 'poor me' type beliefs. Includes reliance on other/belief that can't help self.*	*"Well I can't do nothing about it but I want you to leave me alone."* [P]
	Appeasement *Conciliatory response to maintain order.*	***"**I'm better than you".* [A] *...No you're not, we're equal."* [P]
	Ambivalence of ending relationship *Reticence indicated about losing relationship with avatar/voice.*	*"I'm pleased in one way and in another way I'm going to be missing you."* [P]
	Request advice/guidance *Places other in expert position.*	***"**So maybe if I could be a better person like you, people could start to think about me like that as well?"* [A]
	Apology *Expression of remorse for previous behaviour.*	*"I said last time I'm sorry that I bullied you…"* [A]
Autonomy Asserting	**Downplays threat/coping/reduce impact** *Minimises threat made by other.*	***"**You're not having the affect that you use to have on me. I'm more able to ignore you more now and carry on with my everyday life".* [P]
	Challenge/dismiss other's assertion *Challenges/disagrees with other.*	***"**You're not better than me."* [P]
	Increase power *A shift from powerless to powerful.*	*"Yes I believe I've taken the power away from you."* [P]
	Self-agency *Re-establishes control. Captures how one will act.*	*"I'll say what I like."* [P]
	Separate – disaffiliate *Explicit statement that one is separate and different from other. A disentanglement.*	***"**You're you're not like me, you're more negative than me."* [P]
	Separate – distance *Preference for distance, personal space and privacy. Adaptive request for other to leave.*	*"I want you to go away and stay out of my life because you don't own me."* [P]
	Ending of relationship *Informs ending of 'relationship'.*	*"Think I'm ready to follow that plan [of no longer speaking with voices] to see how it goes."* [P]

Note. A = Avatar; P = Participant.

Data for avatar submissive/autonomy asserting and participant controlling/autonomy giving behaviours do not form part of this investigation and are therefore not reported in this current thesis. Please see appendix for further data.

2: Therapeutic Techniques

During therapy, the therapist and avatar incorporate a number of therapeutic processes to facilitate participant change at the relating and broader level (e.g., self-esteem). From analysing AVATAR pilot recordings and the AVATAR therapy manual (Craig et al., 2015b), reviewing AVATAR therapy literature (Craig et al., 2016; Leff et al., 2013; Leff et al., 2014) and consulting with AVATAR therapists, we developed six therapeutic macro codes: *Promote Assertive Responding*, *General AVATAR Techniques*, *Making Sense of Voices*, *Self*-Esteem, *CBT Techniques* and *mentalising*. Each of these macro codes were formed by a number of micro codes. Please see Table 2 for the therapeutic techniques manual. Each micro code is presented with corresponding descriptors and verbatim examples.

Promote Assertive Responding

Fundamental to the role of the therapist is supporting participants to stand up to the avatar (Leff et al., 2013). This is of particular importance in the first phase of therapy where the voiced avatar reflects a dominant-hostile position. During this stage, the therapist prompts assertive responses through *reinforcement* and if necessary, offers *verbatim instructions*. Therapists may provide *general encouragement*. For example, often participants may initially speak with their avatar in a barely audible voice (Leff et al., 2014). When this occurs, the therapist encourages participants to raise their voice.

General AVATAR Techniques

Participants often have some anxiety when initially engaging with the visual avatar (Craig et al., 2016). The therapists ensure that participants are comfortable by *checking-in* with them. Given that people who experience distressing voices relate to AVH from a position of subordination (Gilbert et al., 2001), to ensure this way of

relating is not played during therapy, participants are invited – as therapy progresses - *to decide direction of therapy and/or to open up dialogue.*

Making Sense of Voices

Cognitive models suggest anomalous experiences appraised as externally caused influence affective and behaviour responses (Garety et al., 2001). Therapist/avatar interactions which explore AVH as *internally generated* and/or *links voices to past adverse experiences (including trauma and loss)* were coded here. In addition to mean making links, *promote disengagement* considers the role of relating negatively to AVH.

Self-Esteem

A key phase of therapy is promoting self-esteem and agency (Craig et al., 2016). As the sessions proceed, the avatar typically aims to improve self-esteem by *asking about positive qualities/ask what other say/ ask about functioning.* This may take the form of asking participants to bring in a list of positive qualities written by someone close to them (Craig et al., 2016). *Positive evaluation of other* may help participants acknowledge their own positive qualities and facilitate a self-compassionate approach (Leff et al., 2014).

CBT Techniques

This macro code defines therapeutic techniques derived from CBT approaches. *Normalising* and *validation*/*empathy* are tools employed by the therapist and avatar. The final stages of the intervention focus on participant's hopes of recovery (Craig et al., 2016). Future-orientated interactions such as *goal setting* were recorded here.

Mentalising

The ability to infer mental states of other individuals has been found to be impaired in people with schizophrenia (Frith & Corcoran, 1996). Aspects of AVATAR therapy have been conceptualised to draw on mentalising approaches (Brent & Fonagy, 2014). *Reflection*, *changeability* and *holding other in mind* were coded here. These micro codes are based on a mentalisation behavioural therapy manual (Bateman, Bales, & Hutsebaut, 2012) and the metacognition assessment scale (Semerari et al., 2003).

Table 2: *Therapeutic techniques manual*

Macro Code	Micro Code *Description*	Example
General AVATAR Techniques	**Positive statement on recovery (voice specific)** *Statement communicating progress and success.*	*"But it's good to hear that you've not been getting any bullying [voices] in the last week".* [A]
	Problem Solving (voice specific) *Discussion of solutions for future hypothetical situations.*	*"So what will you do if you hear me again, will you stumble?"* [A]
	Check in (emotional state, distress, coping) *Therapist checks in with participant regarding emotional state, distress levels, coping.*	*"Just want to check in again how you feeling?"* [T]
	Coping with avatar dialogue* *Participant confirms that they can manage dialogue.*	*"I'm feeling much more confident about me talking to him today actually."* [P]
	Distressed with avatar dialogue* *Participant acknowledges difficulty managing dialogue.*	*"Yea, very difficult."* [P]
	Participant invited to decide direction of therapy and/or to open up dialogue *Allows for participant autonomy.*	*"What do you want to say to me today?"* [A]
	Participant states direction of therapy* *Participant able to inform of the direction of therapy.*	*"Em, I want to say I'm an adult now and I make my own decisions…and I'm responsible for my own feelings?"* [P]
	Participant does not state direction of therapy * *Participant unable to inform of the direction of therapy and may require therapist guidance.*	*"No, no I'd rather stop there."*[P]
Promote Assertive Responding**	**Reinforce**** *Participant opposes avatar and therapist congratulated participant.*	*"That's really good. You've done really well, you've got lots of positive stuff here."* [T]
	Verbatim instruction ** *Therapist delivers a direct instruction.*	*"Say and now I'm going to leave you alone, I'm not going to listen to you anymore. 10 years is enough. Ok?"* [T]
	General encouragement (inc. advice) ** *Therapist continues to encourage participant to be assertive with avatar.* *Therapist may also offer participant advice as to how to 'deal' with avatar.*	*"And I want you to, make it, mustn't let him interrupt you, you must take command of the situation, alright?"* [T]

Making Sense of Voices	**Links voices to inner beliefs** *Linking voice content to inner beliefs about the self (not necessarily involving internal generation, just content reflection).*	*"I'm beginning to see that but you know I've been echoing some of the things that you think about yourself. You've called yourself useless and worthless."* [A]
	Links voices to past adverse experiences (including trauma and loss) *Linking voice content to past adverse experiences.*	"*Yes you are. It was because of the nasty experiences I've had in my life and everything and em they have proven to be quite powerful."* [P]
	Voices as internally generated *Voices as internally generated (attribution of source).*	*"When you hear me it's like a memory of who I use to be".* [A]
	Promote disengagement *Consideration of how one relates to voices. Also may illustrate perpetuating role of engaging with voices.*	*"And then what we've been discussing about your worries and if how if he goes into your worries and if you have conversation it just keeps them going."* [T]
Self Esteem & Agency	**Ask about positive qualities/Ask what other say/ Ask about functioning** *Questioning is aimed to improve self-esteem and self-agency.*	"So what you reckon other people think about you then?" [A]
	Instil hope (inc. well-wishing) *Well-wishing and expression of good will regarding continued broader successes and recovery.*	*"That would be good, I hope that works for you."* [A]
	Positive Evaluation of other *Warm evaluation. Includes agreement with other's attributes/self-praise/strengths.*	*"It's kind of like people like you as well I always thought".* [A]
	Positive self-evaluation (inc. agreement with/what others say)* *Positive comments about the self. Includes self-acknowledgement of achievements.*	*"Well my friends that I've got, my family like me, young people I do voluntary work like me, my doctors like me and em the people I go to the restaurants with."* [P]
	Positive self-agency (inc. socialising)* General personal agency statements. Includes more general acknowledgement of wider social/occupational functioning.	*"No went out to [inaudible] with my mum, my sister and my nephew and we went to em John Lewis and we went to em the coffee shop there and we also went to em IKEA and had lunch in there."* [P]

	Participant not convinced of positive evaluation and/or self-agency* *Reluctance/hesitancy to accept positive evaluations from others.*	*"Well I've got to give you some credit, I mean you've already got more stability in your life than you use to have. I've noticed that. Do you agree with that?"* [A] *...Suppose, not enough though."* [P]
CBT Techniques	**Normalising** *Therapist normalises participant emotional/behavioural responses to voices/events/therapy.*	*"Yea, yea. Very common to feel, it's a bit of an unusual thing but that's a really good start."* [T]
	Goal setting/Identify goals (behavioural specific) *Identification of activities and goals to work towards.*	"*That's all quite a little way ahead but what you do in the next few weeks?"* [A]
	Validation/empathy *An emphatic response to participant's feelings/behavioural responses to voice/events.*	"*Difficult one to come back to that one."* [T]
Mentalising	**Reflection – self or mirroring other's internal world (inc. explanation of own/other behaviour)** *Self-reflection or mirroring participant's internal world. May connect emotions and thoughts to events.*	"*You've seemed to have proved to be much stronger than you thought."* [A]
	Changeability (of one's and/or other's internal world, thoughts, feelings) *Representation of self and others internal world as changeable and also that one's opinions have changed.*	*"And I wonder, the picture I'm getting of you is very different. As I said I have misjudged you."* [A]
	Holding other in mind *A statement that informs that one has been thinking about the other in the absence of 'direct contact'.*	*"I've thought a lot about you during this time."* [A]

Note. A = Avatar; P = participant; T = therapist. *Participant only code. **Therapist only code.
Data for participant responses to therapeutic techniques do not form part of this investigation and therefore are not reported in this current thesis. Please see appendix for further data.

Coding Unit & Coding Instructions

The coding unit was each vocal interchange between participant and/or avatar and/or therapist.

Coding instructions (see Appendix 3) were developed to enhance objectivity and consistency of observations. There were several instructions to follow when coding. For example, one interchange (e.g., from the participant) may incorporate more than one micro code. To illustrate, a composite participant dialogue is as follows: “Just go away. Just go away, leave and never come back. I am not like you and never will be”. Following coding instructions this one vocal interchange would have two micro codes: *separate – distance* and *separate – disaffiliate*.

Interrater Agreement

Interrater agreement was assessed using percentage agreement and Cohen’s Kappa. Six transcripts were randomly selected (two from session one, two from session four and two from the last session). These were pulled together (creating 545 coding units in total) and coded at the macro level by CO’B and MF-A.

Percentage agreement and non-weighted Kappa values for the six transcripts are provided in Table 3. Percentage agreement values are acceptable (Barth et al., 2017) and Kappa values are indicative of near perfect agreement (Landis & Koch, 1977).

Table 3: *Interrater agreement values for macro codes*

Macro Codes	% Agreement	Kappa
Controlling	74%	.83
Autonomy Giving	80%	.86
Submissiveness	71%	.82
Autonomy Asserting	83%	.89
General AVATAR Techniques	83%	.89
Promote Assertive Responding	89%	.93
Making Sense of Voices	71%	.82
Self-esteem	72%	.82
CBT Techniques	83%	.90
Mentalising	71%	.82

Procedure

All AVATAR therapy sessions were audio-recoded with participant consent. Therapy sessions one, four and last were selected for the current study. These sessions were selected to ensure that the avatar transition in character and relating was captured. The avatar dialogic shift and reduction in hostility is appropriately timed by the therapist (based on individual's formulation) but occurs by or during session four. At this stage, the avatar becomes more supportive and respectful (Leff et al., 2014).

All AVATAR therapy sessions were transcribed by CO'B (75 in total). Written transcripts enabled a sequential unfolding of events and alleviated issues such as speed of interaction commonly found in coding verbal communications (Heyman et al., 2014). Following acceptable levels of interrater agreement, CO'B used the developed coding frame to code all transcripts. Data checks were conducted by CO'B.

Baseline Measures

Baseline measures from the AVATAR RCT (Craig et al., 2015a) were used to describe the sample and two measures were included in exploratory analyses. The authors of this study were blind to all participant post-intervention outcomes.

Sample Characteristics

Psychotic Symptom Rating Scale – Auditory Hallucinations (PSYRATS-AH; Haddock et al., 1999). This is an 11-item scale measuring severity of AVH over an average week. Items include frequency, loudness, controllability, duration, and intensity of distress. Individual items are scored 0-4 with higher scores indicating greater severity. Total scores range from 0-44. It was developed for use with people with psychosis and has been extensively used in research. The PSYRATS-AH has demonstrated good validity and reliability (Haddock et al., 1999) and convergent validity with other similar psychiatric scales (Steel et al., 2007).

Voice Power Differential Scale (VPDS; Birchwood et al., 2000) measures the perceived relative power differential between voice and voice hearer, including strength, confidence, respect, ability to inflict harm, superiority and knowledge. The scale involves presenting an incomplete sentence (e.g., "in relation to my voice I generally feel…") which is followed by a series of five bipolar responses (e.g. "I am more powerful than my voice" to "my voice is more powerful than me"). The instrument has a total power score ranging 7-35, with higher scores indicating a greater power differential in favours of the voice. The scale has good psychometric properties (Birchwood et al., 2011).

Beliefs About Voices Questionnaire - Revised (BAVQ-R*;* Chadwick, Lees, & Birchwood, 2000) is a 35-item self-report measure which focuses on the patient's

beliefs about the voices and indexes how likely the voices are to affect behaviour. Three sub-scales measure beliefs about voices: omnipotence (six items), benevolence (six items) and malevolence (six items). Two further sub-scales measure emotional and behavioral relationships to AVH: resistance (five items on emotion and four on behavior) and engagement (four items on emotion and four on behavior). All items have a four-point response range (0 disagree – 3 agree strongly). The BAVQ-R is psychometrically reliable and valid (Birchwood et al., 2000) and has been extensively used in previous studies with psychotic samples (e.g., Trower et al., 2004). The two subs-scales, omnipotence (range 0–18) and malevolence (range 0 – 18), were used in this study.

Exploratory Analyses: Social Adversity

We wanted to explore the role social adversity has on participant relating. For this study, social adversity was conceptualised as reduced social support (Gayer-Anderson & Morgan, 2013) and the experience of early childhood trauma.

Social Support Questionnaire (SSQ; Sarason, Sarason, Shearin & Pierce, 1987) assesses number of supportive contacts an individual believes they can turn to (across a range of situations) and perceived satisfaction with this. The shorter six-item version was used in this study. Each item has two parts which derive two scores: number of perceived social contacts and satisfaction with social support. The first part measures the number of available others the participant feels they could turn to in various situations (e.g., “Whom can you really count on to be dependable when you need help?”). The second part measures degree of satisfaction with perceived support on a six-point scale ranging from “very dissatisfied” to “very satisfied”. Higher scores are indicative of greater perceived social support. The SSQ has

demonstrated sound psychometric properties (Sarason et al., 1987) and has been used with patient samples (e.g., Furukawa, Harai, Hirai, Kitamura & Takahashi, 1999).

Childhood Trauma Questionnaire – Short Form (CTQ-SF; Bernstein et al., 2003) was used to assess childhood trauma (before the age of 17). The 28-item version was derived from the original 70-item measure. It has five sub-scales (each consisting of five-items) designed to assess: emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect. Three further questions assess minimisation/denial. Sub-scale total scores range from 5 – 25 and the CTQ-SF total ranges from 25 – 125. The CTQ-SF has consistently demonstrated excellent psychometric properties (Bernstein et al., 2003) and has been used across a wide range of patient samples and studies (Baker & Maiorino et al., 2010).

Statistical Analysis

Descriptive Results

Only macro and micro coding data in line with the current aims and hypotheses of this investigation are presented in this thesis.

All data was analysed using the statistical package IBM statistics 21 SPSS. To assess sample characteristics, t tests for parametric data, χ 2 tests for categorical variables and Mann-Whitney test for non-parametric data were conducted.

Micro codes for the relating behaviours and therapeutic techniques provided descriptive data. These are presented in figures and visually maps changes over the three AVATAR therapy sessions. Verbatim examples from therapy sessions are also provided.

Hypotheses Testing

Macro data was used for hypothesis testing. The five macro codes under investigation were: 1) avatar controlling behaviours; 2) avatar autonomy giving behaviours; 3) participant submissiveness; 4) participant autonomy assertive behaviours and; 5) therapist promoting assertive responding techniques.

To asses change over time, independent repeated measures ANOVA were conducted for parametric data and Friedman test for non-parametric data. An alpha level of .05 was used for statistical significance. Appropriate post hoc analyses (with Bonferroni correction applied) were selected to assess direction.

Power calculation was carried out a priori using the "G*Power 3" computer program (Faul, Erdfelder, Lang, & Buchner, 2007). We specified alpha to .05 and desired power to .80. Twenty-five participants were required to detect a medium effect size of .32 (Cohen, 1992).

Results

Sample

Sociodemographic Characteristics

Table 4 displays sociodemographic characteristics of participants randomly selected for the current study (n=25) and the remaining individuals in the AVATAR therapy arm (n=50). There were no differences across descriptors. The mean age of our subsample was 43, and the majority were male (n=18). In respect to ethnicity, just over a third (36%) were white British and just over another third (36%) were black. The majority of individuals were single, reporting few social contacts.

Table 4: *Sociodemographic characteristics*

		Current Study		Statistic		
		Yes n=25	No n=50	*t*	df	*p*
Age, Years						
	Mean (SD)	43.36 (9.20)	42.02 (10.64)	-.54	73	.57
Social Support[1]						
	Mean number of Social Contacts (SD)	1.93 (1.54)[a]	1.60 (1.15)[b]	-.10	70	.09
	Mean Satisfaction with Social Support (SD)	5.13 (1.04)[a]	4.89 (1.21)[b]	-.86	70	.12
				x^2	df	*p*
Gender						
	Male	18	39	.33	1	.57
	Female	7	11			
Ethnicity				3.56	5	.61
	White British	9	17			
	Black British	5	11			
	Black Caribbean	3	3			
	Black African	1	6			
	Asian Indian	2	1			
	Other	5	12			
Marital Status				4.18	5	.52
	Single	22	36			
	Divorced/separated	1	5			
	In a casual relationship	0	4			
	In a steady relationship	1	3			
	Married/cohabiting	1	1			
	Widowed	0	1			

Note. [1] As measured by the SSQSR. [a]n = 23; [b]n = 49. SD = Standard Deviation. df= Degrees of freedom.

Clinical Characteristics

Table 5 presents clinical characterises of those participants included in this study (n=25) and the remaining individuals randomised to the AVATAR therapy arm (n=50). There were no differences in symptomology, perceived power of voices and beliefs about voices between groups. In our sub-sample, the majority of participants had a non-affective psychosis diagnosis (84%). Characteristics of symptoms, as measured by the PYSRATS-AH, are similar to other clinical samples representing high severity and less controllable AVH (Steel et al., 2007). Individuals tended to experience more than one voice, reflecting other similar investigations (McCarthy-Jones et al., 2014). The median duration of illness was shorter in our sub-sample of participants (18 years) than those not included in the current study (23 years). However, when the outlier (51 years) is removed, the mean duration of illness between groups becomes non-significant. There were high rates of trauma in both groups, as measured by summed scores on the CTQ-SF. CTQ-SF total scores are comparable to sum scores reported in other psychosis studies (Mørkved et al., 2017).

Table 5: *Clinical characteristics*

		Current Study		Statistic		
		Yes n=25	No n=50	*t*	df	*p*
PSYRATS - AH Total						
	Mean (SD)	28.44 (4.42)	30 (4.81)	1.36	73	.84
VPDS Total						
	Mean (SD)	21.52 (6.55)[a]	21.86 (6.88)[b]	.18	55	.78
Malevolence[1] Total						
	Mean (SD)	10.32 (3.92)	10.84 (4.91)	.46	73	.84
Omnipotence[1] Total						
	Mean (SD)	9.88 (4.27)	10.34 (3.84)	.47	73	.25
CTQ-SF Total						
	Mean (SD)	48.87 (17.14)[c]	46.42 (17.47)[d]	-.57	70	.99
				x^2	df	*p*
Diagnosis						
	Paranoid schizophrenia	20	37	1.17	4	.88
	Schizoaffective disorder	3	5			
	Bipolar disorder	0	1			
	Unspecific non-organic psychosis	1	4			
	Depression with psychotic symptoms	1	3			
Number of Voices				5.17	5	.40
	1 Voice	4	13			
	2 Voices	6	11			
	3 Voices	3	9			
	4 Voices	2	1			
	5> Voices	6	5			
	Unsure/many voices	4	11			
				U		*p*
Duration of Illness, years						
	Median (SD)	18 (5.2)	23 (7.76)	383		.01

Note. [a]n = 21; [b]n = 36; [c]n = 24; [d]n = 48. SD = Standard Deviation. df = Degrees of freedom.
[1] As measured by the BAVQ-R.

Trauma

Table 6 displays sub-scale scores and prevalence rates of trauma reported by those individuals included in this study (n=25). Moderate-to-severe scores on the sub-scales were used to indicate prevalence rates (Baker & Maiorino, 2010) and are as follows: emotional abuse 13+, physical abuse 10+, sexual abuse 8+, emotional neglect 15+ and physical neglect 10+.

There are high rates of reported trauma with most participants (n=17) indicating that they had experienced at least one type of trauma in in the moderate-to -severe range. The findings reflect well established associations in patient populations (e.g., Mørkved et al., 2017).

Table 6: *Sub-scale total scores and prevalence of trauma sub-types*

Trauma Type[1]	Mean Total (SD)	Median	Prevalence[*]
Emotional Abuse[a]	11.54 (5.44)	10	10 (42%)
Physical Abuse[a]	8 (3.78)	7	5 (21%)
Sexual Abuse	8.40 (6.01)	5	9 (36%)
Emotional Neglect	13.00 (5.44)	12	9 (36%)
Physical Neglect[a]	8.54 (3.50)	8	10 (42%)
Any Category of Trauma			17 (68%)

Note. [1] As measured by the CTQ-SF. [a] One participant did not complete these subscales. [*]Number of participants who reported scores in the moderate-severe range.

Sessional Structure

Table 7 displays information on the makeup of face-to-face AVATAR therapy dialogue. These sessions averaged approximately 10 minutes and participants had the highest frequency of exchanges across all three sessions. Consistent with the therapy's planned method (Craig et al., 2016), from the initial session there is a reduction in direct therapist input and an increase in avatar exchanges.

Table 7: *Number of vocal exchanges per speaker and duration of each AVATAR dialogue therapy session*

Number of vocal exchanges		Therapy session		
		1	4	Last
Avatar	Mean	24.44	53.05	41.76
	(SD)	(9.57)	(24.80)	(19.86)
	Range	9-41	17-117	12-82
Participant	Mean	39.72	61.16	47.12
	(SD)	(13.04)	(24.20)	(19.46)
	Range	10-62	21-123	16-84
Therapist	Mean	20.04	9.20	6.04
	(SD)	(7.43)	(6.10)	(6.44)
	Range	8-34	0-21	0-31
Session duration				
Minutes, seconds	Mean	7.28	13.32	10.47
	(SD)	(2.42)	(4.53)	(5.77)
	Range	3.34-13.09	6.05-22.29	3.50-28.19

Coding

The examination of 75 therapy transcripts resulted in 8,058 codes. Please see Appendix 4, 5 and 6 for raw coding data (including percentage breakdown) of codes by AVATAR therapy session.

The results presented here are by Relating Behaviours and then Therapeutic Techniques.

1: Relating Behaviours

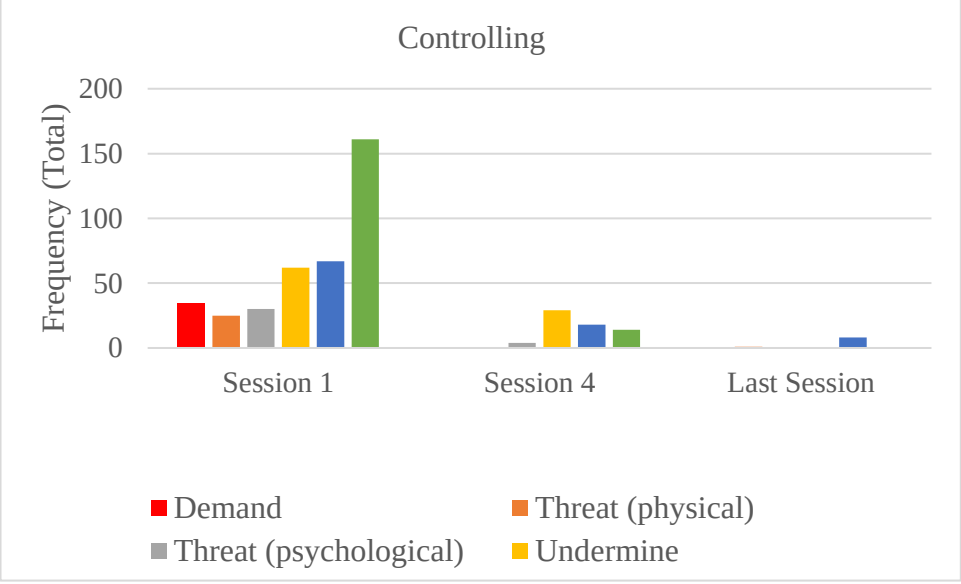
Observed relating behaviours between participant and avatar over the course of therapy are shown below. Total frequency data for micro codes are presented first followed by inferential statistics at the macro level.

Descriptive Results

Controlling - Avatar

Figure 1 displays total avatar controlling micro behaviours over the course of the three sessions. It illustrates that the most frequent controlling behaviour was *abuse/insult/negative evaluation of other.* During session one the avatar maintains a hostile position and examples of abusive dialogue include: “you’re stupid”, “slut, slut, you’re worthless” and “everybody hates you little man. Everybody can’t stand you”. The avatar is reluctant to change the relationship dynamic and this is observed in the number of *holding on/reluctance to change relationship style* seen in session one. For example, one participant tells the avatar they are a bully and not needed in their life to which the voiced avatar responds with “I’m not a bully, you need me”. By the final session the avatar engages in few controlling behaviours.

Figure 1: *Avatar micro controlling behaviours by therapy session*

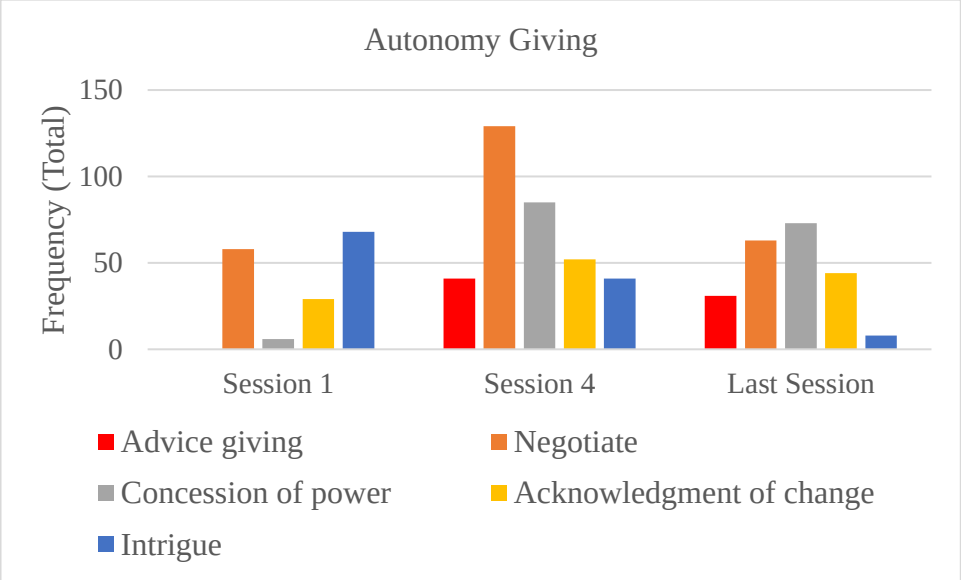


Autonomy Giving - Avatar

Figure 2 displays total avatar micro autonomy giving behaviours over the course of therapy. It indicates that the avatar engages in more autonomy giving behaviours as therapy progresses. It achieves this (mainly) through *negotiating/move towards emancipation.* This peaks in session four. Examples of this observed code include “What do I have to do differently to not show you I’m trying to take control?” and “It’s quite true that you’re confident and that there’s no reason to be in your life anymore”.

As therapy proceeds the avatar begins to relinquish power. *Concession of power* interchanges also peak in session four. Examples are as follows “I think that’s right. I felt the difference, like I don’t have the same power I had I use to over you” and “Well it totally sounds like I’m getting a bit weaker”.

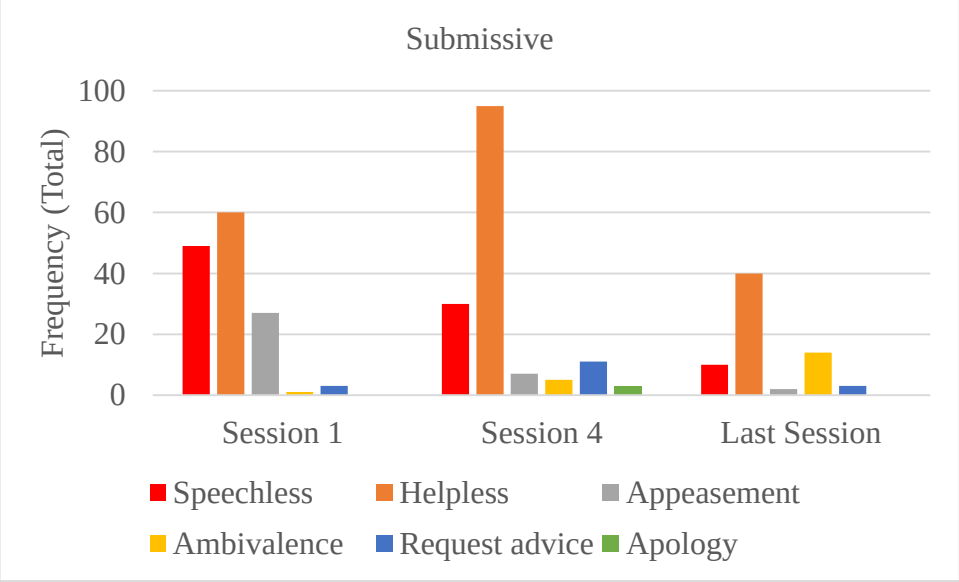
Figure 2: *Avatar micro autonomy giving behaviours by therapy session*



Submissiveness – Participants

Figure 3 displays total participant micro submissive behaviours over the course of therapy. It illustrates a reduction in submissive relating between the first and final AVATAR therapy session. There are fewer *speechless/hesitant* and *appeasement* observed behaviours as therapy progresses. However, there is a spike in *helpless (inc. reliance on others)* behaviours during session four. Following one participant as an example, the participant is initially helpless about the voice-hearer relationship changing "…it's not very nice for me to have to throw them away but since you're saying I have no other choice". During session four the same participant displays helpless behaviours but in reference to own self agency "Yea but still I'm mentally ill aren't I so I can't really be 100%, can I?"

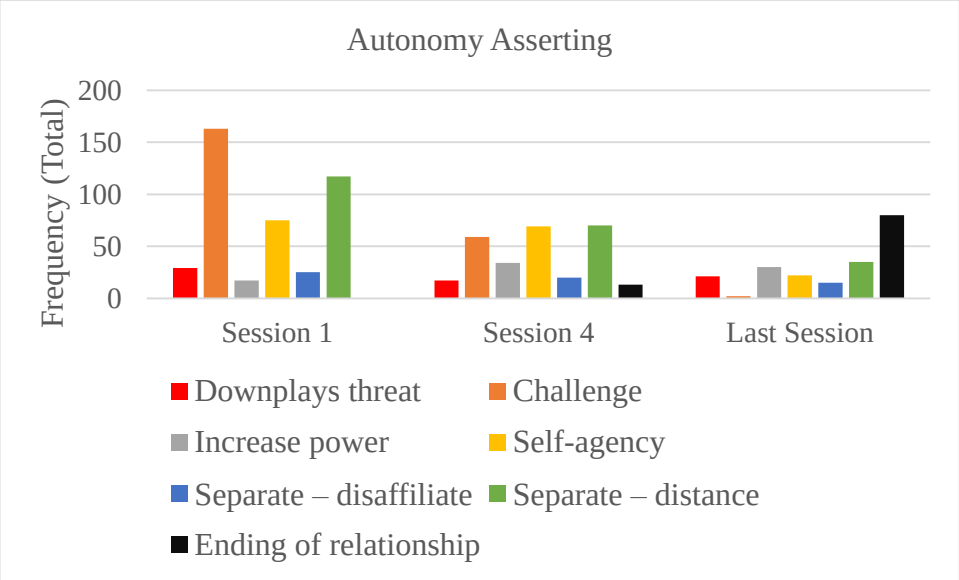
Figure 3: *Participant micro submissive behaviours by therapy session*



Autonomy Asserting – Participants

Figure 4 displays total participant autonomy asserting behaviours over the course of therapy. It indicates that participants engaged in fewer autonomy asserting behaviours as therapy progressed. During session one, participants display high numbers of *challenge/dismiss other's assertion* by responding to the avatar with phrases such as "I'm not nothing, I don't have to listen to this" and "I'm not useless…I've got a degree, I've got my husband, I've got my child, everything that you never had". During the first session participants tend to request the avatar to *separate – distance.* For example, "[you] can clear off and leave me alone" and "Leave me alone and don't come back". A *self-agency* example observed in session four is "No, I don't have to listen to this anymore. You're trying to take control again and I'm not going to let you". As expected, the final session shows an increase in observed *ending of relationship* behaviours (e.g., "No and I want to say for finally yea, that I want this to be my final goodbye to you").

Figure 4: *Participant micro autonomy asserting behaviours by therapy session*



Relating Behaviours: Hypotheses Testing

Table 8 displays macro codes under investigation over the course of AVATAR therapy.

Table 8: *Observed participant and avatar macro relating behaviours*

Macro Codes	Therapy session			Statistical testing		
	1	4	Last	x^2	df	*p*
	Avatar observed behaviours					
Controlling						
Mean (SD)	15.72 (6.18)	3.64 (9.02)	.48 (1.12)			
Median	15	0	0	37.18	2	<.001
Min-max	7-28	0-37	0-5			
				F		*p*
Autonomy Giving						
Mean (SD)	6.48 (4.37)	14.12 (8.56)	9.20 (5.66)	10.91	2,48	<.001
Median	7	15	1			
Min-max	1-13	1-34	2-19			
	Participant observed behaviours			x^2		*p*
Submissiveness						
Mean (SD)	5.68 (5.96)	6.80 (8.42)	3 (4.88)			
Median	4	3	1	7.52	2	.02
Min-max	0-29	0-29	0-23			
Autonomy Asserting						
Mean (SD)	17.52 (8.90)	12 (15.66)	9 (6.66)			
Median	17	10	9	16.64	2	<.001
Min-max	5-23	0-70	0-26			

Hypothesis 1: There will be a reduction in observed avatar controlling behaviours over the course of therapy.

There was a change in observed avatar controlling behaviours during therapy. Consistent with the hypothesis, there was a reduction in controlling behaviours from session 1 to 4 (Z = -3.97, p <.001) and from session 1 to last therapy session (Z = -4.38, p <.001). There was no difference between session 4 and last (Z = -1.65, p = .09).

Hypothesis 2: There will be an increase in observed avatar autonomy giving behaviours over the course of therapy.

There was a difference in the observed avatar autonomy giving behaviours over the therapy sessions. There was a significant increase in autonomy giving behaviours from session one to four (t =-4, p <.001) but not between session one and last (t = -1.88, p = .07). There was a significant reduction in autonomy giving behaviours from session four to last (t = 3.10, p = .005).

Hypothesis 3: There will be a reduction in observed participant submissiveness over the course of therapy.

There was a change in observed participant submissive behaviours over the course of therapy. Consistent with hypotheses, there was a reduction in participant submissive behaviours from the first and last session (Z = -2.76, p =.006). There was no observed difference between session 1 and four (Z = -.39, p =.70) or between session four and last (Z = -2.33, p =.02).

Hypothesis 4: There will be an increase in observed participant assertiveness over the course of therapy.

There was variation in observed participant assertive behaviours over the course of therapy. Against predictions, there was a reduction in participant assertive behaviours from the first and fourth session (Z = -3.13, p =.002) and first and last session (Z = -3.69, p < .001). There was no difference between session four and last (Z = -.58, p =.56).

2: Therapeutic Techniques

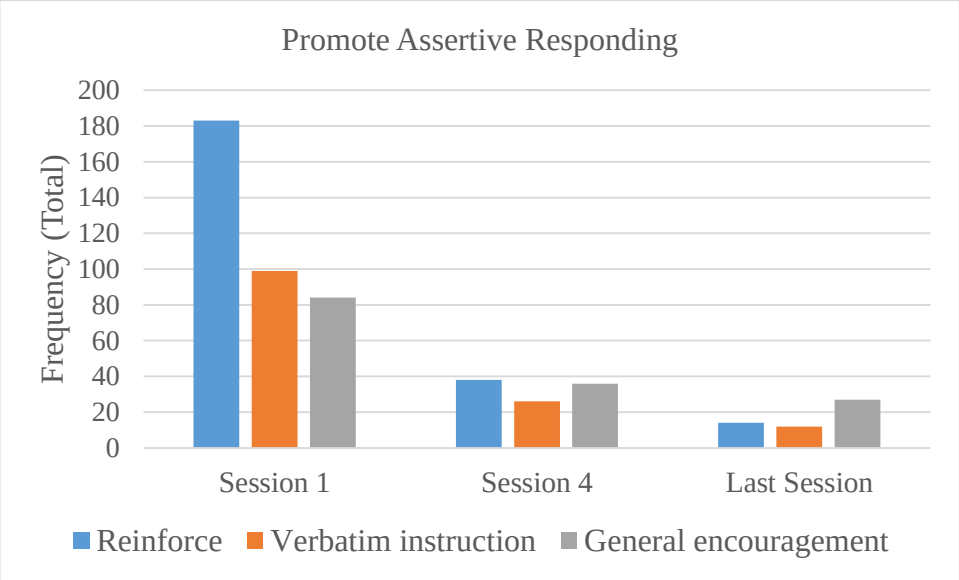
Observed therapist and avatar therapeutic techniques are presented below. Total frequency data for micro codes are presented first for therapist and avatar, followed by inferential statistics at the macro level for the therapist only macro code *promotE assertive responding*.

Descriptive Results

Promote Assertive Responding - Therapist

Figure 5 maps total promoting assertive responding techniques over the three therapy sessions. *Reinforcing* participant assertive behaviours (e.g., "that's brilliant, yea that's really good, that's really strong, I want you to keep going like that ok") were the most frequent. *Verbatim instructions* such as "say to her, I'm not prepared to listen to this anymore" and "speak to him, don't speak like you're talking about him. Rant to him and tell him, I'm not listening to you, I'm not going to take the drugs" were also frequently offered in the first session. There is a clear reduction in the therapist promoting assertive responding as therapy continues.

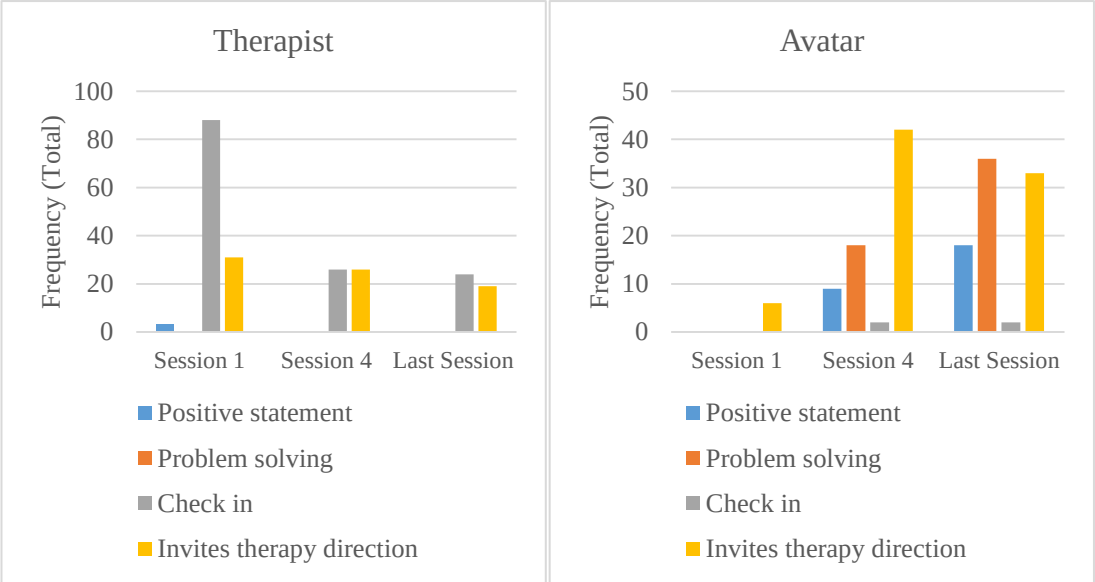
Figure 5: *Promoting assertive responding by therapy session*



General AVATAR Therapy Techniques

Figure 6 displays total general AVATAR therapy techniques. It indicates that therapist *check in* (e.g., "so, so you feeling alright?") markedly reduces following the initial therapy session. From therapy session four, the avatar engages in more general AVATAR techniques, specifically *problem solving* (e.g., "so if you hear me can you just tell me to go away or you don't have to listen to me?") and increasingly *invites participant to decide direction of therapy* (e.g., "what do you want to say to me today?").

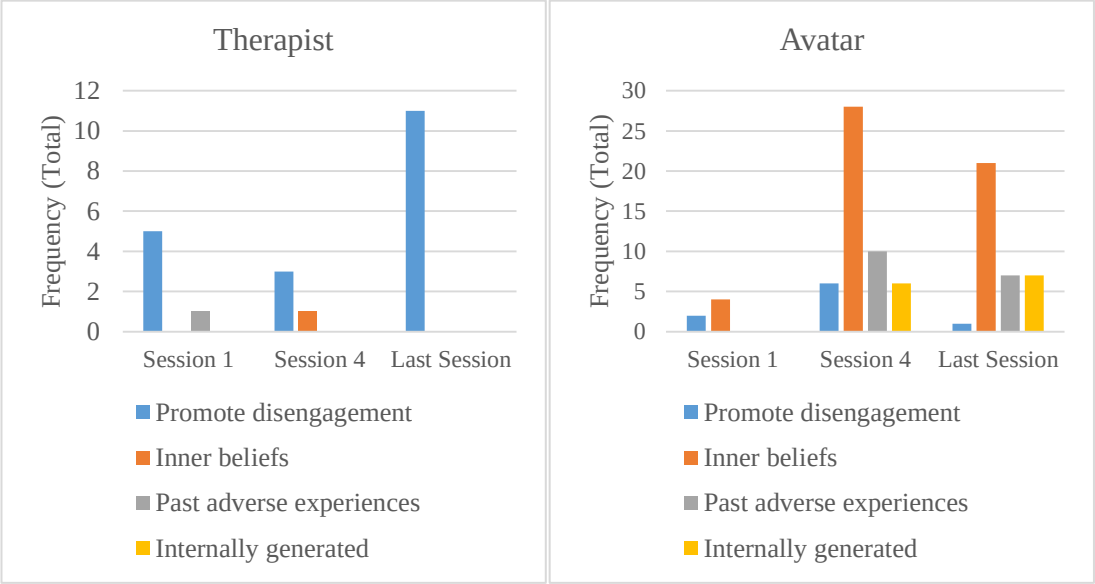
Figure 6: *Therapist/avatar general AVATAR therapy techniques by therapy session*



Making Sense of Voices

Figure 7 maps making sense of voices techniques and shows that many of such techniques were delivered by the avatar. The voiced avatar focuses on linking voices to *inner beliefs* (e.g., "well you worry about being harsh, you worry about being bad, and I've only said those things") and linking voices to *past adverse experiences* (e.g., "I'm just an echo of the bad things you've heard said to you"). The therapist tended to *promote disengagement* from voices (e.g., "Don't answer it, that's right. Because that gets you into the conversation").

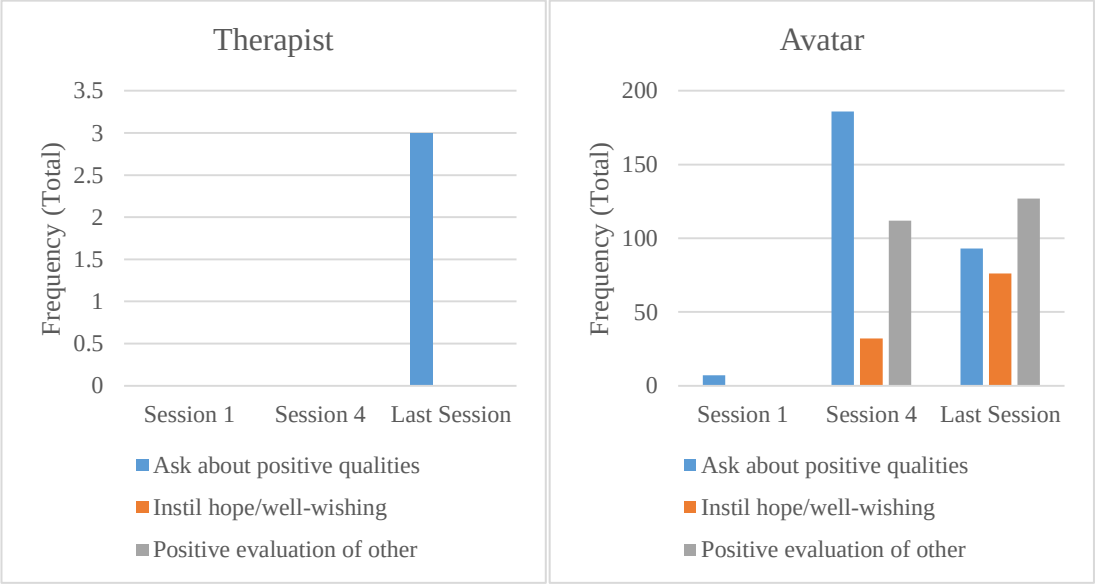
Figure 7: *Therapist/avatar making sense of voices techniques by therapy session*



Self-Esteem

Figure 8 illustrates the emphasis AVATAR therapy places on self-esteem work. This is almost exclusively delivered by the voiced avatar. During session four the avatar frequently *asks about positive qualities*. For instance, the avatar becomes inquisitive (e.g., "What are your strengths?"), may ask about what others think about the participant (e.g., "What do you think she's talking about when she says you're loyal and caring?") and focuses on participant identity and agency (e.g., "Yea that's good. You use to be a welder before didn't you?"). Reflecting avatar's transition from session four, there is an increase in the number of *positive evaluations of other*. Examples include, "that's why you're a good person" and "What your friends and family say about you it's true". In the final session, there is an increase in the number of avatar *instilling hope/well-wishing* such as "This may not mean much, coming from a man like me but you do deserve a good life." and "…I'm sure you can do it and I wish you very well with that".

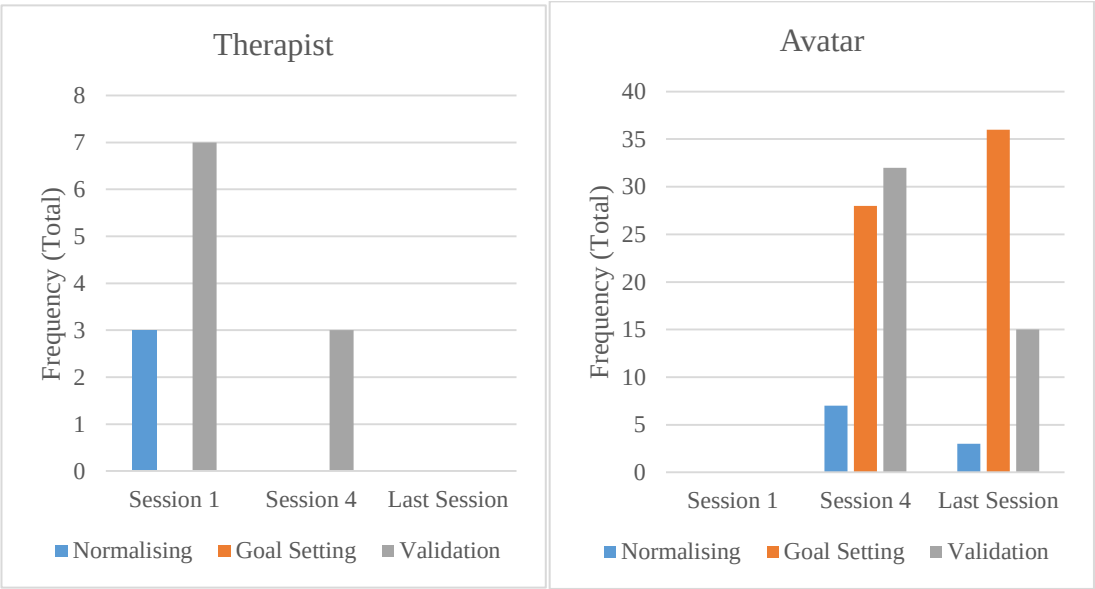
Figure 8: *Therapist/avatar self-esteem techniques by therapy session*



CBT Techniques

Figure 9 displays CBT techniques over the three sessions. The therapist engages in a small number of CBT techniques in the first phase of therapy such as *normalising* (e.g., "It can be a bit strange at first for people but you you're doing absolutely brilliantly") and *validation/empathy (*e.g., "…I know this is tough"). From session four onwards the avatar mainly delivers CBT techniques. The avatar becomes more *validating* ("e.g., I hear what you're saying. That must make things difficult, trying to do things in the real world") and as therapy draws to a close, there is an increase in avatar *goal setting* techniques such as "What other parts of your life you going to pick up?" and "So what is the first step?"

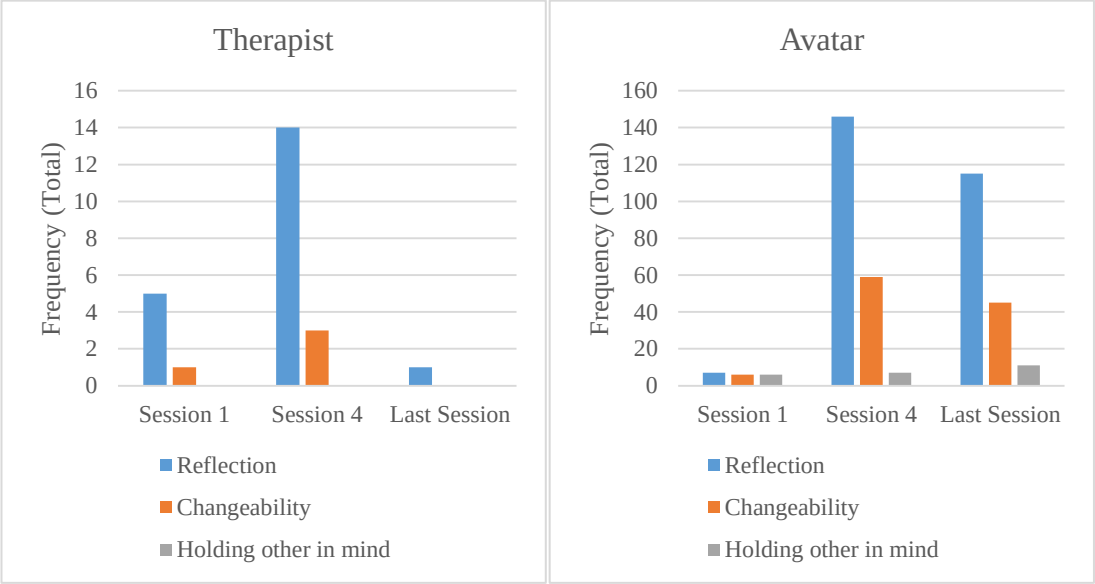
Figure 9: *Therapist/avatar CBT techniques by therapy session*



Mentalising

Figure 10 illustrates how the number of mentalising techniques increase from session one. There is a spike in the number of *reflections* during session four typically from the voiced avatar. Examples include "Well I have a feeling that you start to doubt yourself again" and "You must admit you see yourself as a little girl too, a frightened little girl". From session four the avatar also acknowledges that their opinion has changed (*changeability*) and includes examples such as "I clearly got it very wrong about you" and "You know sometimes you can make a mistake about someone". Avatar *holding other in mind* (e.g., "I thought about what you said last week") is seen to a lesser extent.

Figure 10: *Therapist/avatar mentalising techniques by therapy session*



Therapeutic Techniques: Hypothesis Testing

Hypothesis 5: There will be a reduction in therapist promoting assertive responding techniques over the course of therapy.

Table 9 indicates that there was a change in observed promoting assertive behaviours techniques over the three therapy sessions. In line with hypothesis, there was a reduction in direct therapist intervention from session one to four (Z = -4.20, p <.001), first to last session (Z = -4.35, p < .001) and session four to last (Z = -2.71, p =.007).

Table 9: *Observed therapist promoting assertive responding techniques*

	Therapy session			Statistical testing		
Macro Code	1	4	Last	x^2	df	p
Promote assertive responding						
Mean (SD)	15.04 (5.64)	4.60 (3.79)	2.08 (2.91)			
Median	16	4	0	37.31	2	<.001
Min-max	3-26	0-16	0-9			

3: Exploratory Analyses: Role of Social Adversity

Exploratory univariate correlational analysis of total participant submissiveness and total participant assertiveness with baseline variables were

conducted. Tests of significance were two-tailed. Spearman correlations are presented in Table 10. No significant associations were found between any of the total sub-scale scores of the CTQ-SF (including CTQ-SF total) and participant submissiveness/assertiveness.

With respect to social support, higher number of social contacts was found to be associated with fewer total submissive behaviours. However, this association does not remain significant when controlled for multiple testing (as significance level re-set to p <.006). No significant relationships between satisfaction with social support and overall submissive and assertive behaviours were found.

Table 10: *Correlations between observed participant relating behaviours and baseline measures*

Baseline Measures		Participant Submissiveness $r_{s,}$	Participant Assertiveness $r_{s,}$
Trauma Sub-Scale Totals [1]	Emotional Abuse[a]	-.39, p = .051	-.07, p = .75
	Physical Abuse[a]	-.03, p =.85	-.01, p = .69
	Emotional Neglect	-.08, p = .70	.32, p = .12
	Physical Neglect[a]	-.20, p = .33	-.22, p = .29
	Sexual Abuse	.18, p = .40	-.14, p = .52
	CTQ-SF Total	-.27, p = .19	-.28, p = .18
Social Support[2]	Number of Social Contacts[b]	-.51, p = .01*	.12, p = .60
	Satisfaction with Social Support [b]	.10, p = .96	.16, p = .57

$r_{s,}$ = Spearman correlation. [a] n = 24; [b] = 23. [1]As measured by the CTQ-SF.[2] As measured by the SSQSR. *p <.05.

Discussion

AVATAR therapy incorporates cognitive and interpersonal understandings of voice hearing into a novel intervention. This relational approach aims to target putative mechanisms of AVH distress such as voice control/power and hearer self-

esteem (Craig et al., 2015a). Like all manualised interventions, a key stage of evaluation is the examination of its intended techniques during therapy (Onwumere et al., 2009).

This study developed a coding frame which allowed a fined grained analysis (producing 8,058 codes) of AVATAR therapy dialogue. To our best knowledge, this is the first study to map relating behaviours observed between participants and their dominant voice, in this case represented as a visual representation (avatar). The results illustrate that the relating profiles of both participants and avatars change over the course of AVATAR therapy dialogue. The data provided here details key AVATAR therapy 'ingredients' and indicates that there is indeed a intended shift from the initial phase of therapy - with focus on voice relating, to a second phase - with focus on self-concept and self-esteem (Craig et al., 2015a).

AVATAR Therapy: Changing the Relationship with Voices

Reducing Voice Dominance

AVATAR therapy shares a commonality with other psychological interventions in that a key aim is to increase participant assertiveness and reduce voice dominance (Craig et al., 2015a). Our data illustrates how AVATAR therapy works to achieve this. Distressing AVH are typically characterised by negative content (Beavan & Read, 2010; Nayani & David, 1996) and this is reflected in the high frequency of avatar abusive behaviours observed in the initial session. Our findings do indicate that following the first session, the avatar moves away from a dominating way of relating: there is a significant reduction in controlling behaviours and a significant increase in autonomy giving behaviours.

Individuals who hear voices often relate to them from a position of passivity and subordination which AVATAR therapy aims to challenge. Data presented here highlights the role the therapist plays in supporting participants respond assertively to the avatar. Therapists' promote assertive responding mainly through positively reinforcing assertive behaviour and offering verbatim instructions. This is seen most frequently in the first AVATAR therapy session. In line, participants displayed the highest number of assertive responses when they were supported directly by the therapist.

Following from this first session, we predicted that participant assertiveness would continue to rise over the course of AVATAR therapy. Instead we found a reduction over the course of therapy. There are several interpretations of this finding. We have outlined that assertive responses are very much promoted in session one and therefore the reduction in assertiveness reflects a change in therapy direction e.g., from session four more time is spent on enhancing participant self-esteem. A further interpretation (not necessarily independent) is that the reduction in participant assertive responses mirrors a decrease in avatar controlling behaviours. Following the tenets of complementarity (Benjamin, 1989), perhaps then it is not surprising that as avatar controlling behaviours reduce, participant assertive responses are no longer required.

Reducing Hearer Submissiveness

Although there was an overall fall in submissive behaviours by the final session of therapy, a closer inspection of the data reveals a spike in the helpless responses during session four. One account of this unexpected observation is that the focus of AVATAR therapy changes in session four, with more emphasis on self-esteem work. Individuals with schizophrenia often experience a loss of self-agency

(Davidson & Strauss, 1992) and therefore a rise in helpless behaviours in response to more active, goal-orientated discussion may have been expected. Furthermore, it has been noted by the trial therapists (Craig et al., 2016) that for few individuals with entrenched low self-esteem, this stage (i.e., hearing positive evaluations) is a difficult or even an aversive experience. This may go some way in explaining why participant helplessness was highest in this initial phase of treatment. It also highlights the need for psychological therapies to foster a more functional sense of self in this population (Davidson & Strauss, 1992).

Our exploratory analysis tentatively points towards a relationship between a lack of social contact and overall voice related submissiveness. Although this was a trend finding, it adds further support to the suggestion that social relating influences AVH relating (Birchwood et al., 2004; Hayward, 2003).

AVATAR Therapy: Beyond the Voice-Hearer Relationship

Consistent with the therapy's aim (Craig et al., 2015a), our findings do indicate that the avatar becomes more conciliatory and supportive from session four, initiating a second phase of treatment. During this phase, more time is spent on problem solving techniques, promotion of agency through various forms (e.g., asking participants to decide direction of therapy, future goal setting) and making sense of voices. This is now nearly exclusively delivered by the avatar. For example, the once hostile avatar now offers frequent positive evaluations. Appraisals from significant others are thought to play a key role in improving self-esteem (Crocker & Major, 1989) and given that voice hearers do forge relationships with their voices, often built over many years (Gilbert et al., 2001), hearing the avatar positively evaluate their qualities may have proven particularly validating.

Certain aspects of AVATAR therapy have been construed to be similar to mentalisation based approaches (Brent & Fonagy, 2014). Our observations show a high number of mentalising type interactions during AVATAR therapy dialogue. In many instances the avatar offers reflections, 'mirroring' the internal mental states of participants. In addition, the voiced avatar is seen to explain persecutory behaviour and informs participant that 'their' opinion (usually about the participant) has changed. An intriguing line of enquiry is whether these interactions are successful in facilitating participants to explore their own and others mental states, in keeping with what mentalisation approaches would aim for (Bateman et al., 2012).

Trauma and Relating Styles

We conducted exploratory analyses to assess whether early childhood trauma was linked to overall submissive and assertive relating behaviours. We found no association between any variables which may seem surprising given the high rates of trauma reported here and moreover, the role trauma is suspected to play in the formation of interpersonal and role-related schemas (Birchwood et al., 2004). One possible explanation is that the correlational analyses was conducted among a small sample size. Therefore, it is difficult to determine whether the findings represent a genuine non-association or lacked power to detect a correlation. Alternatively, childhood trauma may influence other interpersonal behaviours not necessarily expected to be observed in AVATAR therapy. For example, violent behaviour (Ruddle, Pina, & Vasquez, 2017) or social withdrawal (Alden & Taylor, 2004), areas not investigated in this thesis.

Clinical Implications

The findings from this study provide a number of clinical implications. Firstly, the findings do indicate that hearers' relating behaviours to distressing voices are amenable to change, at least in the context of AVATAR therapy. This is encouraging given that the participants included in this study presented with high levels of symptomatology and an established course of illness. Secondly, an aim of this study was to assess whether AVATAR therapy delivers what it intends to deliver. Our findings provide support that the key ingredients outlined in the protocol (Craig et al., 2015a) are observed during AVATAR therapy dialogue. Thirdly, our findings tentatively suggest that assertiveness training may not always be indicted in therapeutic work. We speculate that more important than being assertive is not being in a hostile relationship where you need to be. Fourthly, the relationship between diminished social contact and submissive behaviours indicates the importance that increased social contact may serve in improving relationships with voices. How people relate socially is mirrored in the voice hearing relationship (Hayward, 2003) and therefore improving social schema may influence a change in the voice hearing relationship (Birchwood et al., 2004). Fifthly, our findings elucidate the importance of thorough assessments of individuals' beliefs about the origin of their voices (Craig et al., 2016). For some participants therapy dialogue very much focused on AVH as internally generated. For others, therapy focused on weakening the perceived power of an identified external other. Sixthly, the number of coded participant relating behaviours suggest that voice hearing can be conceptualised (at least within as a sub-sample of distressed voiced hearers) as an interpersonal experience.

Limitations and Areas for Further Investigation

Several limitations warrant consideration. This study only included AVATAR therapy completers. Therefore, this sample may not be representative of a wider group of individuals who experience distressing AVH. Moreover, there may have been key differences in relating styles between those who completed the trial and the approximately 20% of individuals who did not (Craig et al., 2016). For instance, they may have presented with higher submissive and fewer assertive behaviours. The frequency of observed participant interpersonal behaviours in this investigation supports working relationally with distressing AVH. However, we accept that this is within a specific therapeutic environment and that not all hearers feel they have a relationship with their voice (Chin, Hayward, & Drinnan, 2009). Subsequently, the results of this study may have limited generalisability.

Although the development of the coding frame was informed by the research questions and relevant theory, we did not follow a priori methodological plan. This is not uncommon (Bakeman & Gottman, 1997). However, we are aware that this may have influenced interpretations of behaviours under investigation. To ensure consensus and 'credibility' of findings, additional 'audits' and triangulation with external factors, such as participant outcomes, could be conducted (Elliott, Fischer, & Rennie, 1999). A further methodological limitation was categorical coding. This meant that the dimensional aspect of a behaviour (e.g., degree of abuse, degree of assertiveness) could not be assessed. Further work could code behaviours at a dimensional level to enable an assessment of more subtle changes. Although our data suggests that individuals grew in confidence in confronting their avatar as therapy progressed (an indirect measure being that therapist behaviour reduced) this was not measured. Future research could assess this formally. This could be achieved by

measuring the emotional intensity of participant dialogue (e.g., Warwar & Greenberg, 1999).

We were unable to assess attachment security among participants. This was unfortunate given the role attachment has in shaping relationship patterns and regulating affect (Read & Gumley, 2008). Further work could investigate whether attachment type is associated with changes in voice hearer relating. As observed in the final therapy session, for a small proportion of individuals there was a degree of ambivalence about ending the relationship with their voice (avatar). The implication of this finding is that although voices can be hostile, losing a relationship – perhaps where individuals have few – is more concerning (Gilbert et al., 2001). Indeed, some findings point towards voices, irrespective of content, acting as an adaptive function particularly among those with a lack of social contact (Mawson, Berry, Murray, & Hayward, 2011). Further research could explore whether ambivalence around ending a relationship with voices is more prevalent among people with fewer social contacts.

We acknowledge that our findings only pertain to one aspect of the AVATAR therapy 'package' – the voiced dialogue. Therefore, this study is unable to comment on the preparatory work (e.g., role plays) which takes place between participant and therapist, pre-and-post dialogue session. Finally, although this study was successful in detailing the techniques delivered to target putative mechanisms of voice related distress, it cannot offer an account on the effects these had on outcomes. Future work is needed to explore these putative mechanisms and examine the effect they exert (Rollinson et al., 2008), which is one aim of the RCT (Craig et al., 2015a).

Conclusion

The development of a coding framework enabled a detailed investigation of relating behaviours between participant and avatar, as-well-as providing an insight into the therapeutic techniques involved within AVATAR therapy dialogue. The findings support the conceptualising of voice hearing as an interpersonal experience and demonstrate how the relating profiles of participants and avatars change over the course of therapy. Results recorded here also indicate that the intended techniques of AVATAR therapy are observed during therapy dialogue.

References

Alden, L. E., & Taylor, C. T. (2004). Interpersonal processes in social phobia. *Clinical Psychology Review, 24*(7), 857-882.

Baker, A. J., & Maiorino, E. (2010). Assessments of emotional abuse and neglect with the CTQ: Issues and estimates. *Children and Youth Services Review*, *32*(5), 740-748.

Barth, J., de Boer, W. E., Busse, J. W., Hoving, J. L., Kedzia, S., Couban, R., ... & Kunz, R. (2017). Inter-rater agreement in evaluation of disability: systematic review of reproducibility studies. *British Medcial Journal, 356*, 1-12.

Bakeman, R., & Gottman, J. M. (1997). *Observing interaction: An introduction to sequential analysis*. Cambridge: Cambridge University press.

Bateman, A. W., & Fonagy, P. (2004). Mentalization-based treatment of BPD. *Journal of Personality Disorders*, *18*(1), 36-51.

Bateman, A., Bales, D., & Hutsebaut, J. (2012). *A quality manual for MBT*. Unpublished manual.

Baumeister, D., Sedgwick, O., Howes, O., & Peters, E. (2017). Auditory verbal hallucinations and continuum models of psychosis: A systematic review of the healthy voice-hearer literature. *Clinical Psychology Review*, *51*, 125-141.

Beavan, V., & Read, J. (2010). Hearing voices and listening to what they say: The importance of voice content in understanding and working with distressing voices. *The Journal of Nervous and Mental Disease*, *198*(3), 201-205.

Benjamin, L. S. (1974). Structural analysis of social behavior. *Psychological Review*, *81*(5), 392.

Benjamin, L. S. (1989). Is chronicity a function of the relationship between the person and the auditory hallucination? *Schizophrenia Bulletin*, *15*(2), 291.

Bentall, R. (2006). Madness explained: why we must reject the Kraepelinian paradigm and replace it with a 'complaint-orientated' approach to understanding mental illness. *Medical Hypotheses*, *66*(2), 220-233.

Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., ... & Zule, W. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse & Neglect*, *27*(2), 169-190.

Berry, K., Wearden, A., Barrowclough, C., Oakland, L., & Bradley, J. (2012). An investigation of adult attachment and the nature of relationships with voices. *British Journal of Clinical Psychology*, *51*(3), 280-291.

Birchwood, M., Gilbert, P., Gilbert, J., Trower, P., Meaden, A., Hay, J., ... & Miles, J. N. (2004). Interpersonal and role-related schema influence the relationship with the dominant 'voice' in schizophrenia: a comparison of three models. *Psychological Medicine*, *34*(08), 1571-1580.

Birchwood, M., Meaden, A., Trower, P., Gilbert, P., & Plaistow, J. (2000). The power and omnipotence of voices: subordination and entrapment by voices and significant others. *Psychological Medicine*, *30*(2), 337-344.

Birchwood, M., Michail, M., Meaden, A., Tarrier, N., Lewis, S., Wykes, T., ... & Peters, E. (2014). Cognitive behaviour therapy to prevent harmful compliance with command hallucinations (COMMAND): a randomised controlled trial. *The Lancet Psychiatry*, *1*(1), 23-33.

Birchwood, M., Peters, E., Tarrier, N., Dunn, G., Lewis, S., Wykes, T., ... & Michail, M. (2011). A multi-centre, randomised controlled trial of cognitive therapy to prevent harmful compliance with command hallucinations. *BMC Psychiatry*, *11*(1), 155.

Birtchnell, J. (1996). *How humans relate: A new interpersonal theory*. Hove: Psychology Press.

Brent, B. K., & Fonagy, P. (2014). A mentalization-based treatment approach to disturbances of social understanding in schizophrenia. In P. H. Lysaker, G. Dimaggio, & M. Brune (Eds.), *Social Cognition and Metacognition in Schizophrenia: Psychopathology and Treatment Approaches.* London, UK: Elsevier Science and Technology.

Chadwick, P., & Birchwood, M. (1994). The omnipotence of voices. A cognitive approach to auditory hallucinations. *The British Journal of Psychiatry*, *164*(2), 190-201.

Chadwick, P., Lees, S., & Birchwood, M. (2000). The revised beliefs about voices questionnaire (BAVQ-R). *The British Journal of Psychiatry*, *177*(3), 229-232.

Chin, J. T., Hayward, M., & Drinnan, A. (2009). Relating to voices: Exploring the relevance of this concept to people who hear voices. *Psychology and Psychotherapy: Theory, Research and Practice*, *82*(1), 1-17.

Connor, C., & Birchwood, M. (2013). Power and perceived expressed emotion of voices: their impact on depression and suicidal thinking in those who hear voices. *Clinical Psychology & Psychotherapy*, *20*(3), 199-205.

Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., & Petticrew, M. (2013). Developing and evaluating complex interventions: the new Medical Research Council guidance. *International Journal of Nursing Studies*, *50*(5), 587-592.

Craig, T. K., Rus-Calafell, M., Ward, T., Fornells-Ambrojo, M., McCrone, P., Emsley, R., & Garety, P. (2015a). The effects of an Audio Visual Assisted Therapy Aid for Refractory auditory hallucinations (AVATAR therapy): study protocol for a randomised controlled trial. *Trials*, *16*(1), 349.

Craig, T. K., Rus-Calafell, M., Ward, T., Fornells-Ambrojo, M., McCrone, P., Emsley, R., & Garety, P. (2015b). *AVATAR Therapy. Guide for clinicians new to the approach.* Unpublished manual.

Craig, T., Ward, T., & Rus-Calafell, M. (2016). AVATAR Therapy for Refractory Auditory Hallucinations. In B. Prandhan, N. Pinninti, & S. Rathod (Eds.), *Brief Interventions for Psychosis* (pp. 41-54). Switzerland: Springer International Publishing.

Crocker, J., & Major, B. (1989). Social stigma and self-esteem: The self-protective properties of stigma. *Psychological Review*, *96*(4), 608.

Daalman, K., Diederen, K. M. J., Derks, E. M., van Lutterveld, R., Kahn, R. S., & Sommer, I. E. (2012). Childhood trauma and auditory verbal hallucinations. *Psychological Medicine*, *42*(12), 2475-2484.

Davidson, L., & Strauss, J. S. (1992). Sense of self in recovery from severe mental illness. *Psychology and Psychotherapy: Theory, Research and Practice*, *65*(2), 131-145.

Dunn, G., Fowler, D., Rollinson, R., Freeman, D., Kuipers, E., Smith, B., ... & Bebbington, P. (2012). Effective elements of cognitive behaviour therapy for psychosis: results of a novel type of subgroup analysis based on principal stratification. *Psychological Medicine, 42*(5), 1057-1068.

Elliott, R., Fischer, C. T., & Rennie, D. L. (1999). Evolving guidelines for publication of qualitative research studies in psychology and related fields. *British journal of Clinical Psychology, 38*(3), 215-229.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175-191.

Fonagy, P., & Target, M. (1997). Attachment and reflective function: Their role in self-organization. *Development and Psychopathology, 9*(04), 679-700.

Frith, C. D., & Corcoran, R. (1996). Exploring 'theory of mind' in people with schizophrenia. *Psychological Medicine, 26*(3), 521-530.

Furukawa, T. A., Harai, H., Hirai, T., Kitamura, T., & Takahashi, K. (1999). Social Support Questionnaire among psychiatric patients with various diagnoses and normal controls. *Social Psychiatry and Psychiatric Epidemiology, 34*(4), 216-222.

Gajwani, R., Patterson, P., & Birchwood, M. (2013). Attachment: Developmental pathways to affective dysregulation in young people at ultra-high risk of developing psychosis. *British Journal of Clinical Psychology, 52*(4), 424-437.

Garety, P. A., Kuipers, E., Fowler, D., Freeman, D., & Bebbington, P. E. (2001). A cognitive model of the positive symptoms of psychosis. *Psychological Medicine*, *31*(02), 189-195.

Gayer-Anderson, C., & Morgan, C. (2013). Social networks, support and early psychosis: a systematic review. *Epidemiology and Psychiatric Sciences*, *22*(2), 131-146.

Gilbert, P., & Allan, S. (1994). Assertiveness, submissive behaviour and social comparison. *British Journal of Clinical Psychology*, *33*(3), 295-306.

Green, C., Garety, P. A., Freeman, D., Fowler, D., Bebbington, P., Dunn, G., & Kuipers, E. (2006). Content and affect in persecutory delusions. *British Journal of Clinical Psychology*, *45*(4), 561-577.

Hayward, M. (2003). Interpersonal relating and voice hearing: to what extent does relating to the voice reflect social relating? *Psychology and Psychotherapy: Theory, Research and Practice*, *76*(4), 369-383.

Hayward, M., Berry, K., & Ashton, A. (2011). Applying interpersonal theories to the understanding of and therapy for auditory hallucinations: a review of the literature and directions for further research. *Clinical Psychology Review*, *31*(8), 1313-1323.

Hayward, M., Jones, A. M., Bogen-Johnston, L., Thomas, N., & Strauss, C. (2016). Relating Therapy for distressing auditory hallucinations: A pilot randomized controlled trial. *Schizophrenia Research*, *183*, 137-142.

Hayward, M., Overton, J., Dorey, T., & Denney, J. (2009). Relating therapy for people who hear voices: a case series. *Clinical Psychology & Psychotherapy, 16*(3), 216-227.

Heyman, R., Lorber, M. F., Eddy, J. M., & Schellati, T. (2014). Behavioral observation and coding. In C. M. Rudd, & H. T. Reis (Eds.), *Handbook of research methods in social and personality psychology*. Cambridge, UK: Cambridge University Press.

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, *33,* 159-174.

Leff, J., Williams, G., Huckvale, M. A., Arbuthnot, M., & Leff, A. P. (2013). Computer-assisted therapy for medication-resistant auditory hallucinations: proof-of-concept study. *The British Journal of Psychiatry, 202*(6), 428-433.

Leff, J., Williams, G., Huckvale, M., Arbuthnot, M., & Leff, A. P. (2014). Avatar therapy for persecutory auditory hallucinations: what is it and how does it work? *Psychosis*, *6*(2), 166-176.

Longden, E., Sampson, M., & Read, J. (2016). Childhood adversity and psychosis: generalised or specific effects? *Epidemiology and Psychiatric Sciences*, *25*(4), 349-359.

Marwaha, S., Broome, M. R., Bebbington, P. E., Kuipers, E., & Freeman, D. (2014). Mood instability and psychosis: analyses of British national survey data. *Schizophrenia Bulletin, 40*(2), 269-277.

Mawson, A., Berry, K., Murray, C., & Hayward, M. (2011). Voice hearing within the context of hearers' social worlds: An interpretative phenomenological

analysis. *Psychology and Psychotherapy: Theory, Research and Practice*, *84*(3), 256-272.

McCarthy-Jones, S., Trauer, T., Mackinnon, A., Sims, E., Thomas, N., & Copolov, D. L. (2012). A new phenomenological survey of auditory hallucinations: evidence for subtypes and implications for theory and practice. *Schizophrenia Bulletin*, *40*(1), 231-235.

Morgan, C., Kirkbride, J., Leff, J., Craig, T., Hutchinson, G., McKenzie, K., ... & Murray, R. (2007). Parental separation, loss and psychosis in different ethnic groups: a case-control study. *Psychological Medicine*, *37*(04), 495-503.

Mørkved, N., Endsjø, M., Winje, D., Johnsen, E., Dovran, A., Arefjord, K., ... & Huber, N. (2017). Childhood trauma in schizophrenia spectrum disorder as compared to other mental health disorders. *Psychosis*, *9*(1), 48-56.

Morrison, A. P. (1998). A cognitive analysis of the maintenance of auditory hallucinations: Are voices to schizophrenia what bodily sensations are to panic? *Behavioural and Cognitive Psychotherapy*, *26*(04), 289-302.

Morrison, A. P. (2001). The interpretation of intrusions in psychosis: an integrative cognitive approach to hallucinations and delusions. *Behavioural and Cognitive Psychotherapy*, *29*(3), 257-276.

Morrison, A. P., & Barratt, S. (2009). What are the components of CBT for psychosis? A Delphi study. *Schizophrenia Bulletin*, *36*(1), 136-142.

Nayani, T. H., & David, A. S. (1996). The auditory hallucination: a phenomenological survey. *Psychological Medicine*, *26*(1), 177-189.

Onwumere, J., Kuipers, E., Gamble, C., Jolley, S., Smith, B., Rollinson, R., ... & Freeman, D. (2009). Family interventions in psychosis: a scale to measure therapist adherence. *Journal of Family Therapy*, *31*(3), 270-283.

Read, J., & Gumley, A. (2008). Can attachment theory help explain the relationship between childhood adversity and psychosis? *Attachment—New Directions in Psychotherapy and Relational Psychoanalysis*, *2*(1), 1-35.

Read, J., Os, J. V., Morrison, A. P., & Ross, C. A. (2005). Childhood trauma, psychosis and schizophrenia: a literature review with theoretical and clinical implications. *Acta Psychiatrica Scandinavica*, *112*(5), 330-350.

Read, J., Perry, B. D., Moskowitz, A., & Connolly, J. (2001). The contribution of early traumatic events to schizophrenia in some patients: a traumagenic neurodevelopmental model. *Psychiatry: Interpersonal and Biological Processes*, *64*(4), 319-345.

Robson, G., & Mason, O. (2015). Interpersonal processes and attachment in voice-hearers. *Behavioural and Cognitive Psychotherapy*, *43*(6), 655-668.

Rollinson, R., Smith, B., Steel, C., Jolley, S., Onwumere, J., Garety, P. A., ... & Startup, M. (2008). Measuring adherence in CBT for psychosis: a psychometric analysis of an adherence scale. *Behavioural and Cognitive Psychotherapy*, *36*(2), 163-178.

Ruddle, A., Pina, A., & Vasquez, E. (2017). Domestic violence offending behaviors: A review of the literature examining childhood exposure, implicit theories, trait aggression and anger rumination as predictive factors. *Aggression and Violent Behavior*, *34*, 154-165.

Sarason, I. G., Sarason, B. R., Shearin, E. N., & Pierce, G. R. (1987). A brief measure of social support: Practical and theoretical implications. *Journal of Social and Personal Relationships*, *4*(4), 497-510.

Semerari, A., Carcione, A., Dimaggio, G., Falcone, M., Nicolò, G., Procacci, M., & Alleva, G. (2003). How to evaluate metacognitive functioning in psychotherapy? The metacognition assessment scale and its applications. *Clinical Psychology & Psychotherapy*, *10*(4), 238-261.

Slade, P. D., & Bentall, R. P. (1988). *Sensory deception: A scientific analysis of hallucination*. USA: Johns Hopkins University Press.

Steel, C., Garety, P. A., Freeman, D., Craig, E., Kuipers, E., Bebbington, P., ... & Dunn, G. (2007). The multidimensional measurement of the positive symptoms of psychosis. *International Journal of Methods in Psychiatric Research*, *16*(2), 88-96.

Thomas, N., Hayward, M., Peters, E., van der Gaag, M., Bentall, R. P., Jenner, J., ... & García-Montes, J. M. (2014). Psychological therapies for auditory hallucinations (voices): current status and key directions for future research. *Schizophrenia Bulletin*, *40*(Suppl 4), S202-S212.

Thomas, N., McLeod, H. J., & Brewin, C. R. (2009). Interpersonal complementarity in responses to auditory hallucinations in psychosis. *British Journal of Clinical Psychology*, *48*(4), 411-424.

Trower, P., Birchwood, M., Meaden, A., Byrne, S., Nelson, A., & Ross, K. (2004). Cognitive therapy for command hallucinations: randomised controlled trial. *The British Journal of Psychiatry*, *184*(4), 312-320.

Trower, P., & Chadwick, P. (1995). Pathways to defense of the self: A theory of two types of paranoia. *Clinical psychology: Science and Practice, 2*(3), 263-278.

van Os, J., Kenis, G., & Rutten, B. P. (2010). The environment and schizophrenia. *Nature, 468*(7321), 203-212.

Varese, F., Smeets, F., Drukker, M., Lieverse, R., Lataster, T., Viechtbauer, W., ... & Bentall, R. P. (2012). Childhood adversities increase the risk of psychosis: a meta-analysis of patient-control, prospective-and cross-sectional cohort studies. *Schizophrenia Bulletin*, *38*(4), 661-671.

Warwar, S., & Greenberg, L. S. (1999). *Client emotional arousal scale–III.* Unpublished manuscript.

Wing, J. K., Cooper, J. E., & Sartorius, N. (1974). *The description and classification of psychiatric symptoms: An instruction manual for the PSE and CATEGO system.* London: Cambridge University.

Woods, A., Jones, N., Bernini, M., Callard, F., Alderson-Day, B., Badcock, J. C., ... & Krueger, J. (2014). Interdisciplinary approaches to the phenomenology of auditory verbal hallucinations. *Schizophrenia Bulletin*, *40*(Suppl 4), S246-S254.

Part III: Critical Appraisal

Introduction

In this section, I offer a critical appraisal on the development of the coding framework presented in Part II of this thesis. I begin by highlighting the importance of analysing psychological interventions and then provide a further insight into how we attempted to achieve this in the context of AVATAR therapy. I will describe some of the methodological challenges I encountered and provide some reflections on the research process.

Looking Inside the 'Black Box'

Many, arguably most, psychological interventions can be considered complex in that they incorporate numerous interacting components, require the delivery of a number of techniques and permit a varying degree of flexibility in their delivery (Grant, Treweek, Dreischulte, Foy, & Guthrie, 2013). This poses a challenge for intervention development as-well-as evaluation (Craig et al., 2013). For instance, interventions which do not identify targeted processes and mechanisms – pejoratively labelled as 'black box' (Wight & Obasi, 2003) – provide limited valuable information even from randomised controlled trials (Campbell et al., 2007). If results are non-significant one is left wondering whether it's due to the inherent failure of the developed intervention or instead, due to implementation failure (Oakley et al., 2006). Equally, if results are significant one is left considering what are the 'active ingredients' that led to change (Craig et al., 2013).

Understanding the way in which an intervention is implemented provides invaluable information on outcomes (e.g., why it worked or not) and contributes to the understanding of putative mechanisms of change (Rollinson et al., 2008). The identification of active ingredients is not always straightforward despite the presence of standardised manuals (Craig et al., 2013). For example, therapists shape the

techniques prescribed by the intervention (Dunn et al., 2012) and these techniques can number many. This is highlighted in Morrison and Barratt's (2010) Delphi study where 77 key components of cognitive behavioural therapy (CBT) for psychosis were endorsed. The sheer volume of possible prescribed techniques coupled with a degree of delivery flexibility clearly poses a challenge in adherence rating (Perepletchikova & Kazdin, 2005). However, this should not deter inquiry (Dittmann et al., 2017) and it is encouraging to see that more methodological robust trials and interventions are paying greater attention this phase of evaluation (e.g., Birchwood et al., 2014).

A Good Theory-Testing Tool

Once a research question has been formulated the next step is deciding what methodology to use. In the examination of AVATAR therapy, a method which enabled the measurement of relating behaviours and therapeutic techniques was required. Given that we had access to audio-recordings of AVATAR therapy, behavioural observation seemed the obvious method of choice. Although an umbrella term, behavioural observation is generally considered to refer to the systematic recording of predefined behaviours of interest (Heyman, Lorber, Eddy & West, 2014). This method is appealing to researchers for several reasons. The method is systematic and provides an objective quantitative account of an event or behaviour under investigation across a given course of time (Heyman et al., 2014). Furthermore – and fitting to the research questions outlined in section II of this thesis – the method is also of particular value when processes and not outcomes are the area of research interest (Bakeman & Quera, 2011). Where telescopes are the tools of choice in astronomy, coding frames are the tools of choice in observational methods (Bakeman & Quera, 2011). These "theory testing tools" (Heyman, 2014, p. 345) are

formed by a number of codes, each of which having roots in theory and links to the research questions.

'Borrowing' Coding Frames?

Using a standardised coding system is an exciting prospect for any researcher. They offer a tantalising shortcut; the codes have been developed and validation and reliability checks completed. However, I was unable to find an existing coding frame which would meet the demands of the research questions we proposed. To our knowledge, no behavioural observation system has been developed to map relating behaviours between voice hearers and their voices in such a novel, 'live' way - as occurs in AVATAR therapy. At this stage I came across Bakeman and Gottman's (1997) particularly fitting analogy which reads "we sometimes hear people ask: do you have a coding system I can borrow? This seems to us a little like wearing someone else's underwear (p. 15)". This proved a useful comparison and reminded me that coding frames are unique and grounded in the specific theory under investigation. What works for one study does not necessary fit another. Therefore, the challenge was to develop a coding system which accurately measures the behaviours and techniques specific to AVATAR therapy dialogue.

Like most researchers who have experience in developing coding systems, we found the development of a coding framework an iterative and lengthy process. The coding system should fit the hypotheses under scrutiny and therefore a large proportion of time and effort is rightly spent at this stage (Heyman et al., 2014). We developed codes from a variety of information sources. These included: reviewing the literature, examining other established coding systems, listening to pilot tapes and holding consensus meetings with AVATAR trial therapists. Although this ensured completeness, it led to a challenge in determining how fine-grained the frame would

be. We wanted to ensure the coding frame captured general themes (e.g., controlling type behaviours, self-esteem work) but also wanted to detail specific behaviours (e.g., abusive behaviours, positive evaluation of other). The final decision to code at both the micro and macro level offered the 'best of both worlds' (Heyman et al., 2014). It enabled us to "brush with broad strokes" (Bakeman & Quera, 2011, p. 19), without losing fine detail.

The number of codes to include posed a further challenge. Too few and we ran the risk of missing key behaviours, too many and the coding measure becomes unworkable. The risk at this stage is that one can easily get lost in trying to capture a seemingly infinite number of behaviours. For example, I often left with increasingly more and more behaviours to record after listening to AVATAR therapy pilot tapes. At times, I felt I was veering off course. Fortunately, regular meetings with my supervisor ensured that developed codes were more in line with the aims of the study and theoretical underpinnings of the intervention. Furthermore, what I found helpful was remembering that all codes should justify their place in the coding manual (Bakeman & Quera, 2011). If codes were not observed in the piloting phase or not clearly connected to relevant theory and/or or to the research questions, they were removed.

Observer accuracy is fundamental to observational research. Another challenge I encountered and one that warrants consideration, was that that I was analysing an intervention that I myself was invested in. Prior to doctoral training I had worked on the AVATAR randomised controlled trial. I was therefore aware about the theoretical underpinnings and rationale of the trial, enthusiastic about the intervention's promise and had an allegiance with the AVATAR team. I found myself in the unenviable position that potentially my research could disconfirm the

proposed therapeutic techniques delivered in AVATAR therapy dialogue. On the other hand, I did not want to be so caught up with my own preconceived ideas of the benefits of AVATAR therapy that I would 'see only what I wanted to see'. A parallel with qualitative research and in particular the concept of 'bracketing' (Starks & Brown Trinidad, 2007) can be drawn. I had to recognise my prior knowledge and indeed hopes of the trial and attend to the question of interest with an open and objective mind. What helped improve objectivity was developing clear instructions and a coding manual. The former provided special rules (e.g., what to do when there are multiple codes in one coding unit). The latter offered coding definitions, included verbatim examples and noted similarities and differences between coded behaviours.

The Trials of Observational Coding

Coding systems are clearly appealing when analysing behaviours (Heyman, 2001). However, developing a coding frame and transcribing data is a huge undertaking with some notable downsides. Given our research aims and hypotheses, the translation of spoken words into clear coding units was necessary. Transcribing is a labour-intensive and time-consuming process with even several minutes of recording taking several hours to transcribe (Margolin et al., 1998). There was added complication due to the sample included in the AVATAR study. Participants tended to be chronic, treatment refractory voice hearers and at times there was a derailment in conversation. This added a further layer of difficulty in following the thread of conversation. Additionally, due to the necessity of recreating a realistic voice hearing experience, the created avatar often spoke with a distinct accent and/or used various unfamiliar - to me at least - colloquialisms. This further delayed the transcribing process. With respect to transcribing, personally I found having clear completion

dates to work towards and blocking out days at time, where I could immerse myself in the transcribing process, most beneficial.

Ensuring appropriate specificity and reliability means that any coding frame goes through several phases of development before its deemed sufficient to attempt to answer the research questions. For example, Patterson (1982) built their framework over several decades. Although our methodological development numbered months, not decades, we share similar experiences in that our coding system was tried and tested numerous times. Indeed, the framework presented in the thesis is the finished product of 17 rounds of amendments and refinements. Finally, I do agree with Margolin et al. (1998) who described the coding process as "unwieldy and messy" (p. 29). The method requires great patience, focus and commitment. The 'carrot at the end of the stick' is however the detailed, rich results they provide.

The Nature of AVATAR Therapy Dialogue

I feel no final reflection could be complete without commenting on the nature of dialogue observed in the therapy audio-recordings. AVATAR therapy aims to accurately recreate the experience of distressing voices (Craig, Ward, & Rus-Calafell, 2016). An extension is that the content of the avatar dialogue, at times, was extremely negative. In the initial phase of treatment, threats of violence and racist remarks are commonplace. These are of course voiced by the trial therapists, who do point out that such enactments go against every grain of a therapist's instinct and professional practice (Craig et al., 2016). When transcribing AVATAR therapy sessions much of the initial content of the voiced avatar sat uncomfortable with me. However, understanding the rationale behind this phase of treatment (i.e., exposure to distressing stimulus to reduce anxiety; Craig et al., 2016) allayed concerns. Supporting patients to 'face their fears' is after all a common element of

psychological therapies such as CBT. What's more, the benefits of the intervention seemed apparent to me when I heard the voice of a once barely audible individual speak assertively and confidently come the final session of AVATAR therapy.

Links to Clinical Practice

Although undertaking any research project presents challenges and at times disappointments, the transfer of research findings to clinical practice should inspire. After all, "working with patients is the crucible" (Leff, 2017, p. 52). The research process as a whole offered theory-practice links. I had a privileged position whereby I could hear and learn from highly experienced clinicians. I observed how these therapists sensitively supported individuals become more assertive to their avatars. This helped me consider how patients can be supported to confront and challenge persecutory voices within clinical settings. During clinical placement, I was also able to apply some of the emerging theoretical understandings of voice hearing. For example, exploring similarities between voice and social relating (Hayward, Overton, J., Dorey, & Denney, 2009) when working with clients who experience distressing voices.

Further Limitations to Consider

The developed methodological tool has some limitations of note and areas for further development. As outlined in part II of the thesis, we did spend considerable time assessing the face validity of the developed items. This was achieved by reviewing literature, analysing pilot tapes and discussing item development with AVATAR therapists. Clearly further developmental work is needed. It would be important in the next phase of development to assess the construct validity of developed items. For example, using alternative measures of behaviours (e.g., such as the Voice Power Differential Scale; Birchwood, Meaden, Trower, Gilbert, &

Plaistow, 2000) to assess similar underlying item constructs (e.g., perceived power). Furthermore, we are aware from our coding that certain items seemed to overlap. To tighten the coding system a factor analysis seems indicated to ascertain factor structure (Floyd & Widaman, 1995).

Rather disappointingly this project failed to recruit the expertise of a service-user. This was planned but time constraints did not permit implementation. Service-user involvement would have ensured that the questions posed in this thesis were relevant to the concerns of the service-users themselves. In addition, although the developed codes presented in this project stem from literature and theory, the terminology (e.g., submissive, autonomy asserting, mentalising etc.) may not appropriately fit with service-users' experiences. Consultation with a service-user may have resulted in different language been presented, potentially enhancing the translational value of the study (Ennis & Wykes, 2013). Finally, service-user involvement would have further enhanced the 'credibility' of the coding system through triangulation and respondent validation (Barker, Pistrang, & Elliot, 2002).

Conclusion

Analysing interventions not only ensures prescribed technique are implemented as intended (Onwumere et al., 2009), they can go some way in helping us understand the effects targeted mechanisms have on outcomes (Craig et al., 2013). There are many ways this can be achieved and it's encouraging to see that new interventions pay careful consideration to this phase of development. We developed a coding frame to analyse relating behaviours and therapeutic techniques implemented in AVATAR therapy. The development of any behavioural observation measurement throws up challenges, which at time do seem insurmountable. The development journey is long and arduous; the collection of data, irksome. However,

with a thorough understanding of the theoretical and methodological literature, creation of standardised operating procedures (e.g., coding manuals) and supportive guidance from supervisors, these challenges can be overcome.

I conclude this critical appraisal by offering some reflections on behavioural observation and coding. These derive from a combination of the guidance I sought (e.g., Heyman et al., 2014) and what I learned on this research journey. They are as follows: 1) make each code count! Developed codes should justify their inclusion with roots in theory and clear links to the research questions. If a code does not meet these criteria, remove it; 2) spend sufficient time developing the coding frame. Although at times a seemingly unending process, it's better to ensure you have what is needed than end up missing key components; 3) this however needs to be balanced against an awareness that one cannot capture everything. New unpredicted behaviours will emerge, which if significant enough can spur further development and research; 4) the development of a coding frame is a daunting task and I can certainly attest to the frustrations and effort behavioural coding systems entail. However, the fruits of the labour are found in the rich and detailed results they provide.

References

Bakeman, R., & Gottman, J. M. (1997). *Observing interaction: An introduction to sequential analysis*. Cambridge: Cambridge University press.

Bakeman, R., & Quera, V. (2011). *Sequential analysis and observational methods for the behavioral sciences*. Cambridge: Cambridge University Press.

Barker, C., Pistrang, N. & Elliot, R. (2002). *Research Methods in Clinical Psychology: An Introduction for Students and Practitioners (2nd ed.)*. Chichester: John Wiley & Sons.

Birchwood, M., Meaden, A., Trower, P., Gilbert, P., & Plaistow, J. (2000). The power and omnipotence of voices: subordination and entrapment by voices and significant others. *Psychological Medicine, 30*(2), 337-344.

Birchwood, M., Michail, M., Meaden, A., Tarrier, N., Lewis, S., Wykes, T., ... & Peters, E. (2014). Cognitive behaviour therapy to prevent harmful compliance with command hallucinations (COMMAND): a randomised controlled trial. *The Lancet Psychiatry*, *1*(1), 23-33.

Campbell, N. C., Murray, E., Darbyshire, J., Emery, J., Farmer, A., Griffiths, F., ... & Kinmonth, A. L. (2007). Designing and evaluating complex interventions to improve health care. *BMJ: British Medical Journal*, *334*(7591), 455.

Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., & Petticrew, M. (2013). Developing and evaluating complex interventions: the new Medical Research Council guidance. *International Journal of Nursing Studies*, *50*(5), 587-592.

Craig, T., Ward, T., & Rus-Calafell, M. (2016). AVATAR Therapy for Refractory Auditory Hallucinations. In B. Prandhan, N. Pinninti, & S. Rathod (Eds.), *Brief Interventions for Psychosis* (pp. 41-54). Switzerland: Springer International Publishing.

Dunn, G., Fowler, D., Rollinson, R., Freeman, D., Kuipers, E., Smith, B., ... & Bebbington, P. (2012). Effective elements of cognitive behaviour therapy for psychosis: results of a novel type of subgroup analysis based on principal stratification. *Psychological Medicine, 42*(5), 1057-1068.

Ennis, L., & Wykes, T. (2013). Impact of patient involvement in mental health research: longitudinal study. *The British Journal of Psychiatry*, *203*(5), 381-386.

Grant, A., Treweek, S., Dreischulte, T., Foy, R., & Guthrie, B. (2013). Process evaluations for cluster-randomised trials of complex interventions: a proposed framework for design and reporting. *Trials*, *14*(1), 15.

Heyman, R. E. (2001). Observation of couple conflicts: clinical assessment applications, stubborn truths, and shaky foundations. *Psychological Assessment*, *13*(1), 5-35.

Heyman, R., Lorber, M. F., Eddy, J. M., & Schellati, T. (2014). Behavioral observation and coding. In C. M. Rudd, & H. T. Reis (Eds.), *Handbook of research methods in social and personality psychology*. Cambridge, UK: Cambridge University Press.

Leff, J. (2017). The most important things I have learnt in my career as a psychiatrist. *British Journal of Psychology Bulletin*, *41*(1), 51-55.

Margolin, G., Oliver, P. H., Gordis, E. B., O'hearn, H. G., Medina, A. M., Ghosh, C. M., & Morland, L. (1998). The nuts and bolts of behavioral observation of marital and family interaction. *Clinical Child and Family Psychology Review*, *1*(4), 195-213.

Oakley, A., Strange, V., Bonell, C., Allen, E., Stephenson, J., & RIPPLE Study Team. (2006). Health services research: process evaluation in randomised controlled trials of complex interventions. *BMJ: British Medical Journal*, *332*(7538), 413.

Patterson, G. R. (1982). *Coercive family process* (Vol. 3). Castalia Publishing Company.

Perepletchikova, F., & Kazdin, A. E. (2005). Treatment integrity and therapeutic change: Issues and research recommendations. *Clinical Psychology: Science and Practice*, *12*(4), 365-383.

Rollinson, R., Smith, B., Steel, C., Jolley, S., Onwumere, J., Garety, P. A., ... & Startup, M. (2008). Measuring adherence in CBT for psychosis: a psychometric analysis of an adherence scale. *Behavioural and Cognitive Psychotherapy*, *36*(2), 163-178.

Starks, H., & Brown Trinidad, S. (2007). Choose your method: A comparison of phenomenology, discourse analysis, and grounded theory. *Qualitative Health Research*, *17*(10), 1372-1380.

Wight, D., & Obasi, A. (2003). *Unpacking the black box: the importance of process data to explain outcomes* (pp. 151-166). In J. M Stephenson, J Imrie, & C. Bonell (Eds.) Effective Sexual Health Interventions: Issues in Experimental Evaluation. Oxford, UK: Oxford University Press.

Appendices

Appendix 1: Excluded Papers from Literature Review

Reference	Reason for Exclusion
Aho-Mustonen, K., Tiihonen, J., Repo-Tiihonen, E., Ryynänen, O. P., Miettinen, R., & Räty, H. (2011). Group psychoeducation for long-term offender patients with schizophrenia: An exploratory randomised controlled trial. *Criminal Behaviour and Mental Health*, *21*(3), 163-176.	No AVH specific outcome reported.
Andres, K., Pfammatter, M., Garst, F., Teschner, C., & Brenner, H. D. (2000). Effects of a coping-orientated group therapy for schizophrenia and schizoaffective patients: a pilot study. *Acta Psychiatrica Scandinavica*, *101*(4), 318-322.	No AVH specific outcome reported.
Bachar, E., Canetti, L., Yonah, I., & Bonne, O. (2004). Group versus individual supportive–expressive psychotherapy for chronic, symptomatically stabilized outpatients. *Psychotherapy Research*, *14*(2), 244-251.	No AVH specific outcome reported.
Barrowclough, C., Haddock, G., Lobban, F., Jones, S., Siddle, R., Roberts, C., & Gregg, L. (2006). Group cognitive–behavioural therapy for schizophrenia. *The British Journal of Psychiatry*, *189*(6), 527-532.	No AVH specific outcome reported.
Bechdolf, A., Knost, B., Kuntermann, C., Schiller, S., Klosterkötter, J., Hambrecht, M., & Pukrop, R. (2004). A randomized comparison of group cognitive-behavioural therapy and group psychoeducation in patients with schizophrenia. *Acta Psychiatrica Scandinavica*, *110*(1), 21-28.	No AVH specific outcome reported.
Bechdolf, A., Köhn, D., Knost, B., Pukrop, R., & Klosterkötter, J. (2005). A randomized comparison of group cognitive-behavioural therapy and group psychoeducation in acute patients with schizophrenia: outcome at 24 months. *Acta Psychiatrica Scandinavica*, *112*(3), 173-179.	No AVH specific outcome reported.
Beck-Sander, A., Griffiths, A., & Friel, C. (1998). A group-based intervention for forensic patients recovering from psychosis. *Criminal Behaviour and Mental Health: CBMH*, *8*(3), 193.	No AVH specific outcome reported.
Chadwick, P., Taylor, K. N., & Abba, N. (2005). Mindfulness groups for people with psychosis. *Behavioural and Cognitive Psychotherapy*, *33*(03), 351-359.	No AVH specific outcome reported.
Crawford, M. J., Killaspy, H., Barnes, T. R., Barrett, B., Byford, S., Clayton, K., ... & Kalaitzaki, E. (2012). Group art therapy as an adjunctive treatment for people with schizophrenia: a randomised controlled trial (MATISSE). *Health technology assessment (Winchester, England)*, *16*(8), iii-iv.	No AVH specific outcome reported.

Dean, M., Weston, A. R., Osborn, D. P., Willis, S., Patterson, S., Killaspy, H., ... & Crawford, M. J. (2014). Activity groups for people with schizophrenia: a randomized controlled trial. *Journal of Mental Health*, *23*(4), 171-175.	No AVH specific outcome reported.
Dillon, J., & Hornstein, G. A. (2013). Hearing voices peer support groups: a powerful alternative for people in distress. *Psychosis*, *5*(3), 286-295.	Author Commentary.
Goodliffe, L., Hayward, M., Brown, D., Turton, W., & Dannahy, L. (2010). Group person-based cognitive therapy for distressing voices: views from the hearers. *Psychotherapy Research*, *20*(4), 447-461.	Qualitative design.
Grocke, D., Bloch, S., & Castle, D. (2009). The effect of group music therapy on quality of life for participants living with a severe and enduring mental illness. *Journal of Music Therapy*, *46*(2), 90-104.	No AVH specific outcome reported.
Grocke, D., Bloch, S., Castle, D., Thompson, G., Newton, R., Stewart, S., & Gold, C. (2014). Group music therapy for severe mental illness: a randomized embedded-experimental mixed methods study. *Acta Psychiatrica Scandinavica*, *130*(2), 144-153.	No AVH specific outcome reported.
Hayashi, N., Tanabe, Y., Nakagawa, S., Noguchi, M., Iwata, C., Koubuchi, Y., ... & Horiuchi, K. (2002). Effects of group musical therapy on inpatients with chronic psychoses: a controlled study. *Psychiatry and Clinical Neurosciences*, *56*(2), 187-193.	No AVH specific outcome reported.
Jacobsen, P., Morris, E., Johns, L., & Hodkinson, K. (2011). Mindfulness groups for psychosis; key issues for implementation on an inpatient unit. *Behavioural and Cognitive Psychotherapy*, *39*(03), 349-353.	Incomplete symptom data.
Jhirwal, O. P. (2006). Group cognitive-behavioural therapy vs. group psychoeducation: which is better?. *Acta Psychiatrica Scandinavica*, *113*(1), 74-74.	Author Commentary.
Johns, L., & Wykes, T. (2010). Group cognitive behaviour therapy for psychosis.	Author Commentary.
Jones, N., Marino, C. K., & Hansen, M. C. (2016). The Hearing Voices Movement in the United States: Findings from a national survey of group facilitators. *Psychosis*, *8*(2), 106-117.	Sample (no diagnostic information).
Kanas, N. (1986). Group therapy with schizophrenics: a review of controlled studies. *International journal of group psychotherapy*, *36*(3), 339-351.	Review.
Kingsep, P., Nathan, P., & Castle, D. (2003). Cognitive behavioural group treatment for social anxiety in schizophrenia. *Schizophrenia research*, *63*(1), 121-129.	No AVH specific outcome reported.

Landa, Y., Silverstein, S. M., Schwartz, F., & Savitz, A. (2006). Group cognitive behavioral therapy for delusions: helping patients improve reality testing. *Journal of Contemporary Psychotherapy*, *36*(1), 9-17.	No AH specific outcome reported.
Lecomte, T., Leclerc, C., Corbière, M., Wykes, T., Wallace, C. J., & Spidel, A. (2008). Group Cognitive Behavior Therapy or Social Skills Training for Individuals With a Recent Onset of Psychosis?: Results of a Randomized Controlled Trial. *The Journal of nervous and mental disease*, *196*(12), 866-875.	No AVH specific outcome reported.
Lecomte, T., Leclerc, C., Wykes, T., & Lecomte, J. (2003). Group CBT for clients with a first episode of schizophrenia. *Journal of Cognitive Psychotherapy*, *17*(4), 375-383.	Protocol.
Lecomte, T., Leclerc, C., Wykes, T., & Wallace, C. (2003). Group CBT versus group symptom management for treating psychotic symptoms of young individuals presenting with a first episode of schizophrenia—Preliminary results. *Schizophrenia Research*, *60*(1), 324-325.	Protocol.
Lee, K., Hannan, C., van den Bosch, J. A., Williams, J., & Mouratoglou, V. (2002). Evaluating a hearing voices group for older people: Preliminary findings.	Sample (no diagnostic information).
Leurent, B., Killaspy, H., Osborn, D. P., Crawford, M. J., Hoadley, A., Waller, D., & King, M. (2014). Moderating factors for the effectiveness of group art therapy for schizophrenia: secondary analysis of data from the MATISSE randomised controlled trial. *Social psychiatry and psychiatric epidemiology*, *49*(11), 1703-1710.	No AVH specific outcome reported.
Levine, J., Barak, Y., & Granek, I. (1998). Cognitive group therapy for paranoid schizophrenics: applying cognitive dissonance. *Journal of cognitive psychotherapy*, *12*(1), 3-12.	No AVH specific outcome reported.
Mannu, J., & Borri, G. (2004). The" voices group": A therapeutic group for psychotic patients in a therapeutic community. *Therapeutic Communities*.	Sample (no diagnostic information).
May, K., Strauss, C., Coyle, A., & Hayward, M. (2014). Person-based cognitive therapy groups for distressing voices: A thematic analysis of participant experiences of the therapy. *Psychosis*, *6*(1), 16-26.	Qualitative design.
Mclnnis, E., Sellwood, W., & Jones, C. (2006). A cognitive behavioural groupbased educational programme for psychotic symptoms in a low secure setting: a pilot evaluation. *The British Journal of Forensic Practice*, *8*(3), 36-46.	No AVH specific outcome reported.
Montag, C., Haase, L., Seidel, D., Bayerl, M., Gallinat, J., Herrmann, U., & Dannecker, K. (2014). A pilot RCT of psychodynamic group art therapy for patients in acute	No AVH specific outcome reported.

psychotic episodes: feasibility, impact on symptoms and mentalising capacity. *PloS one*, *9*(11), e112348.	
Newton, E., Landau, S., Smith, P., Monks, P., Shergill, S., & Wykes, T. (2005). Early psychological intervention for auditory hallucinations: An exploratory study of young people's voices groups. *The Journal of nervous and mental disease*, *193*(1), 58-61.	Sample (no diagnostic information).
Oakland, L., & Berry, K. (2015). "Lifting the veil": a qualitative analysis of experiences in Hearing Voices Network groups. *Psychosis*, *7*(2), 119-129.	Qualitative design.
O'Brien, C. P., Hamm, K. B., Ray, B. A., Pierce, J. F., Luborsky, L., & Mintz, J. (1972). Group vs individual psychotherapy with schizophrenics: a controlled outcome study. *Archives of General Psychiatry*, *27*(4), 474-478.	No AVH specific outcome reported.
Owen, M., Sellwood, W., Kan, S., Murray, J., & Sarsam, M. (2015). Group CBT for psychosis: a longitudinal, controlled trial with inpatients. *Behaviour research and therapy*, *65*, 76-85.	Sample (<50% met diagnostic criteria for schizophrenia).
Perlman, L. M., & Hubbard, B. A. (2001). A self-control skills group for persistent auditory hallucinations. *Cognitive and Behavioral Practice*, *7*(1), 17-21.	No AVH specific outcome reported.
Perron, B., & Munson, M. (2006). Coping with voices: A group approach for managing auditory hallucinations. *American Journal of Psychiatric Rehabilitation*, *9*(3), 241-258.	Protocol.
Rathod, S., Phiri, P., Harris, S., Underwood, C., Thagadur, M., Padmanabi, U., & Kingdon, D. (2013). Cognitive behaviour therapy for psychosis can be adapted for minority ethnic groups: a randomised controlled trial. *Schizophrenia research*, *143*(2), 319-326.	No AVH specific outcome reported.
Ruddle, A., Mason, O., & Wykes, T. (2011). A review of hearing voices groups: Evidence and mechanisms of change. *Clinical psychology review*, *31*(5), 757-766.	Review.
Sigman, M., & Hassan, S. (2006). Benefits of long-term group therapy to individuals suffering schizophrenia: A prospective 7-year study. *Bulletin of the Menninger clinic*, *70*(4), 273-282.	No AVH specific outcome reported.
Strauss, C., & Hayward, M. (2013). Group Person-based Cognitive Therapy for Distressing Psychosis. *Acceptance and Commitment Therapy and Mindfulness for Psychosis*, 240-255.	Book Chapter.

Tan, S., Zou, Y., Wykes, T., Reeder, C., Zhu, X., Yang, F., ... & Zhou, D. (2016). Group cognitive remediation therapy for chronic schizophrenia: A randomized controlled trial. *Neuroscience letters*, *626*, 106-111.	No AVH specific outcome reported.
Van Oosterhout, B., Krabbendam, L., De Boer, K., Ferwerda, J., Van der Helm, M., Stant, A. D., & van der Gaag, M. (2014). Metacognitive group training for schizophrenia spectrum patients with delusions: a randomized controlled trial. *Psychological medicine*, *44*(14), 3025-3035.	No AVH specific outcome reported.
Warman, D. M., Grant, P., Sullivan, K., Caroff, S., & Beck, A. T. (2005). Individual and Group Cognitive-Behavioral Therapy for Psychotic Disorders A Pilot Investigation. *Journal of Psychiatric Practice*®, *11*(1), 27-34.	Receiving other psychological treatment.

Appendix 2: Ethical Approval

IRAS Project Filter

The integrated dataset required for your project will be created from the answers you give to the following questions. The system will generate only those questions and sections which (a) apply to your study type and (b) are required by the bodies reviewing your study. Please ensure you answer all the questions before proceeding with your applications.

Please complete the questions in order. If you change the response to a question, please select 'Save' and review all the questions as your change may have affected subsequent questions.

Please enter a short title for this project (maximum 70 characters) Reducing the frequency and severity of voices: AVATAR Clinical Trial

1. Is your project research?

(●) Yes ( ) No

2. Select one category from the list below:

( ) Clinical trial of an investigational medicinal product

( ) Clinical investigation or other study of a medical device

( ) Combined trial of an investigational medicinal product and an investigational medical device

(●) Other clinical trial to study a novel intervention or randomised clinical trial to compare interventions in clinical practice

( ) Basic science study involving procedures with human participants

( ) Study administering questionnaires/interviews for quantitative analysis, or using mixed quantitative/qualitative methodology

( ) Study involving qualitative methods only

( ) Study limited to working with human tissue samples (or other human biological samples) and data (specific project only)

( ) Study limited to working with data (specific project only)

( ) Research tissue bank

( ) Research database

If your work does not fit any of these categories, select the option below:

( ) Other study

2a. Will the study involve the use of any medical device without a CE Mark, or a CE marked device which has been modified or will be used outside its intended purposes?

(●) Yes ( ) No

2b. Please answer the following question(s):

a) Does the study involve the use of any ionising radiation? Yes No ○ ◉

b) Will you be taking new human tissue samples (or other human biological samples)? ○ Yes ◉ No

c) Will you be using existing human tissue samples (or other human biological samples)? ○ Yes ◉ No

3. In which countries of the UK will the research sites be located? *(Tick all that apply)*

- ☑ England
- ☐ Scotland
- ☐ Wales
- ☐ Northern Ireland

3a. In which country of the UK will the lead NHS R&D office be located:

- ◉ England
- ○ Scotland
- ○ Wales
- ○ Northern Ireland
- ○ This study does not involve the NHS

4. Which review bodies are you applying to?

- ☐ HRA Approval
- ☑ NHS/HSC Research and Development offices
- ☐ Social Care Research Ethics Committee
- ☑ Research Ethics Committee
- ☐ Confidentiality Advisory Group (CAG)
- ☐ National Offender Management Service (NOMS) (Prisons & Probation)

For NHS/HSC R&D offices, the CI must create Site-Specific Information Forms for each site, in addit to the study-wide forms, and transfer them to the PIs or local collaborators.

5. Will any research sites in this study be NHS organisations?

◉ Yes ○ No

5a. Are all the research costs and infrastructure costs for this study provided by an NIHR Biomedical Research Centre, NIHR Biomedical Research Unit, NIHR Collaboration for Leadership in Health Research and Care (CLAHRC) or NIHR Research Centre for Patient Safety & Service Quality in all study sites?

○ Yes ◉ No

If yes and you have selected HRA Approval in question 4 above, your study will be processed through HRA Approval.

If yes, and you have not selected HRA Approval in question 4 above, NHS permission for your study will be processed through the NIHR Coordinated System for gaining NHS Permission (NIHR CSP).

5b. Do you wish to make an application for the study to be considered for NIHR Clinical Research Network (CRN) support and inclusion in the NIHR Clinical Research Network (CRN) Portfolio? Please see information button for further details. Yes No

(●) ( )

If yes, you must complete a NIHR Clinical Research Network (CRN) Portfolio Application Form immediately after completing this project filter and before submitting other applications. If you have selected HRA Approval in question 4 above your study will be processed through HRA Approval. If not, NHS permission for your study will be processed through the NIHR Coordinated System for gaining NHS Permission (NIHR CSP).

6. Do you plan to include any participants who are children?

( ) Yes (●) No

7. Do you plan at any stage of the project to undertake intrusive research involving adults lacking capacity to consent for themselves?

( ) Yes (●) No

Answer Yes if you plan to recruit living participants aged 16 or over who lack capacity, or to retain them in the study following loss of capacity. Intrusive research means any research with the living requiring consent in law. This includes use of identifiable tissue samples or personal information, except where application is being made to the Confidentiality Advisory Group to set aside the common law duty of confidentiality in England and Wales. Please consult the guidance notes for further information on the legal frameworks for research involving adults lacking capacity in the UK.

8. Do you plan to include any participants who are prisoners or young offenders in the custody of HM Prison Service or who are offenders supervised by the probation service in England or Wales?

( ) Yes (●) No

9. Is the study or any part of it being undertaken as an educational project?

( ) Yes (●) No

10. Will this research be financially supported by the United States Department of Health and Human Services or any of its divisions, agencies or programs?

( ) Yes (●) No

11. Will identifiable patient data be accessed outside the care team without prior consent at any stage of the project (including identification of potential participants)?

( ) Yes (●) No

NOTICE OF SUBSTANTIAL AMENDMENT

Please use this form to notify the main REC of substantial amendments to all research other than clinical trials of investigational medicinal products (CTIMPs).
The form should be completed by the Chief Investigator using language comprehensible to a lay person.

Details of Chief Investigator:

	Title	Forename/Initials	Surname
	Professor	Thomas	Jamieson CRAIG
Work Address	Health Service & Population Research Institute of Psychiatry De Crespigny Park		
PostCode	SE5 8AF		
Email	[redacted]		
Telephone	[redacted]		
Fax			

Full title of study: Reducing the frequency and severity of auditory hallucinations: A randomised clinical trial of a novel Audio-Visual Assisted Therapy Aid for Refractory auditory hallucinations (AVATAR therapy) compared to supportive counselling.

Lead sponsor: King's College London

Name of REC: London-Hampstead Research Ethics Committee

REC reference number: 13/LO/0482

Name of lead R&D office: South London and Maudsley NHS Foundation Trust

Date study commenced: 06.11.2013

Protocol reference (if applicable), current version and date: Avatar Protocol_v7_19.01.2015

Amendment number and date: Amendment_7 11/08/2015

Type of amendment

(a) Amendment to information previously given in IRAS Yes (●) No ( )

If yes, please refer to relevant sections of IRAS in the "summary of changes" below.

(b) Amendment to the protocol

(●) Yes ( ) No

If yes, please submit <u>either</u> the revised protocol with a new version number and date, highlighting changes in bold, or a document listing the changes and giving both the previous and revised text.

(c) Amendment to the information sheet(s) and consent form(s) for participants, or to any other supporting

(c) Amendment to the information sheet(s) and consent form(s) for participants, or to any other supporting documentation for the study Yes (●) No ( )

If yes, please submit all revised documents with new version numbers and dates, highlighting new text in bold.

Is this a modified version of an amendment previously notified and not approved?

( ) Yes (●) No

Summary of changes

Briefly summarise the main changes proposed in this amendment. Explain the purpose of the changes and their significance for the study.
If this is a modified amendment, please explain how the modifications address the concerns raised previously by the ethics committee.
If the amendment significantly alters the research design or methodology, or could otherwise affect the scientific value of the study, supporting scientific information should be given (or enclosed separately). Indicate whether or not additional scientific critique has been obtained.

1. Recent research (Laroi et al., 2012; McCarthy-Jones et al., 2014; Woods et al., 2015) suggests that a detailed knowledge of the different features of the voice-hearing experience is necessary to ensure firstly a complete understanding of the experience and secondly to analyse their relationship with other aspects of the therapeutic engagement. A number of qualities of the voice experience (e.g. whether the voice reflects a past experience, is associated with a sense of a 'presence' or is thought by the sufferer to have purpose or intention) might plausibly influence the participants' engagement with AVATAR therapy. The research clinicians therefore wish to explore these qualitative aspects through an analysis of the audio-recordings from therapy and assessment sessions.
2. Eight to ten 10 participants will be interviewed using photo-elicitation in order to explore what participants feel conveys their experiences of voice hearing, visual clues for times when the voices have been intense or nice as well as in relation to suicidal thoughts. Photo-elicitation is a qualitative technique that uses images to prompt and guide in-depth interviews (Harper, 2002). It involves providing study participants with disposable cameras, asking them to take at least 15 photographs that they believe represents aspects and provokes emotions related to the experience of hearing voices and using a discussion of their images to acquire rich verbal data in interviews. Interviews will be conducted with participants who scored positively on the Calgary Depression Scale, Question 8 (suicidality question). Participants will be given detailed information on why the study is being conducted and informed consent will be obtained. Participants who consent to the study will be seen at two time points. First, an initial meetings where disposable cameras issued and instructions of how to take photos is given. In the second meeting, an in-depth 45 minute face to face interview will be conducted after the photographs have been developed.

3. Additional information about the use of individual's avatar creation with people who do not experience voices has been added in the patient's information sheet, for the AVATAR fMRI study.

List of enclosed documents

Document	*Version*	*Date*
fMRI AVATAR Patient Information Sheet	V2	13/02/2015
fMRI AVATAR Patient Consent Form	V2	13/02/2015
AVATAR Photo Elicitation Patient Infromation Sheet	V1	21/04/2015
AVATAR Photo Elicitation Consent Form	V1	21/04/2015
Avatar Protocol	V8	20/08/2015

Declaration by Chief Investigator

1. *I confirm that the information in this form is accurate to the best of my knowledge and I take full responsibility for it.*
2. *I consider that it would be reasonable for the proposed amendment to be implemented.*

This section was signed electronically by Professor Thomas Jamieson-Craig on 20/08/2015 15:59.

Job Title/Post: Professor

Organisation: Institute of Psychiatry

Email: thomas.craig@kcl.ac.uk

Declaration by the sponsor's representative

I confirm the sponsor's support for this substantial amendment.

This section was signed electronically by Mr Keith Brennan on 11/09/2015 12:06.

Job Title/Post: Director of Research Management & Innovation

Organisation: King's College London

Email: [redacted]

Appendix 3: Coding Instructions

Coding Unit

Each vocal interchange (avatar/Participant/Therapist).

Levels of Coding

1: Relating Behaviours – at the relating level, between participant and avatar.

2: Therapeutic Techniques and Participant Responses – incorporates broader factors such as occupation, social functioning etc. These techniques are delivered by the therapist/avatar. Participant responses at this level do not form part of the main aims of the project and therefore are not included in the main body of this thesis. They are however included in Appendix 4.

Instructions and Considerations

1) *Multiple Codes in one Coding Unit*

Although on occasion one interchange may incorporate numerous instances of identified behaviours (e.g., Demands) do not use the same *specific micro* code multiple times. The decision to only use specific code once per interchange is to enhance interrater reliability and coding efficiency.

For example:

"Just go away. Just go away, leave and never come back. I never want to hear or see from you again".

The above (composite) quote could be coded Separate - Distance x 4. However, following the above instruction, one would code just Separate - Distance x 1.

In line, although each interchange can potentially have multiple codes, each segment of interchange can only have one *specific micro* code.

2) *Overlap between Levels/Codes – Prioritise Interdependence Codes*

If there is an overlap between Level 1 and level 2 and coder is finding it difficult to distinguish between both codes at Level 1 and Level 2 (and it doesn't seem appropriate to code on two levels), rate hierarchically with Level 1 having preference. The rationale is that Level 1 captures specifically interpersonal relating which is the main aim of study.

3) *Thought Disordered Responses*

If participant response is clearly not related to thread of conversation, perhaps characterised by tangibility and/or distractibility, code the *entire* interchange as *Thought Disordered Response (104).*

4) *Acknowledgment of Change (11) & Changeability (50)*

Acknowledgment of change (11) refers to change at the interpersonal level and may include comparison to previous ways of relating. Inevitably there will be some

overlap with Changeability (50) and therefore own judgement is needed. To distinguish between the two, consider the latter to deal with change at the 'intra' level and as a result can be conceptualised as a more mentalising type behaviour. As the case where codes overlap, consider thread of conversation to facilitate final coding decision.

5) *Autonomy asserting: Conflict or Boundary Setting?*

One envisaged difficulty is determining whether interchange is either *Autonomy Asserting – Conflict (5)* or *Autonomy Asserting – Boundary Setting (6)*. To help, it is useful to consider that the former relates to more of a 'defiant' type of response, whereas the latter is taking on individual onus to change relationship (or a 'moving on') and with this, often there is some reference to self-action.

Appendix 4: Participant Coding Data

Macro Code	Micro Code	Total Frequency (%)		
		Therapy Session 1	Therapy Session 4	Last Session
Controlling	Demand.	12 (1.1%)	10 (.6%)	13 (1.1%)
	Threat (physical).	2 (.2%)	-	1 (.1%)
	Threat (psychological).	-	-	-
	Undermine (instil doubt).	-	-	-
	Holding on/reluctance to change relationship style.	-	-	-
	Abuse/insult/negative evaluation of other.	49 (4.5%)	9 (.6%)	14 (1.1%)
Autonomy Giving	Advice giving.	-	18 (1.1%)	15 (1.2%)
	Negotiate/move towards emancipation.	-	2 (.1%)	1 (.1%)
	Concession of power.	-	-	-
	Acknowledgment of change.	-	1 (.1%)	-
	Intrigue (express positive surprise about change).	-	-	1 (.1%)
Submissiveness	Speechless/hesitant.	49 (4.5%)	30 (1.9%)	10 (.8%)
	Helpless (inc. reliance on others).	60 (5.5%)	95 (6%)	40 (3.3%)
	Appeasement.	27 (2.5%)	7 (.4%)	2 (.2%)
	Ambivalence of ending relationship.	1 (.1%)	5 (.3%)	14 (1.1%)
	Request advice/guidance.	3 (.3%)	11 (.7%)	3 (.2%)
	Apology.	-	3 (.2%)	-
Autonomy Asserting	Downplays threat/coping/reduce impact.	29 (2.7%)	17 (1.1%)	21 (1.7%)
	Challenge/dismiss other's assertion.	163 (15%)	59 (3.8%)	2 (.2%)
	Increase power.	17 (1.6%)	34 (2.2%)	30 (2.4%)
	Self-agency.	75 (6.9%)	69 (4.4%)	22 (1.8%)
	Separate – disaffiliate.	25 (2.3%)	20 (1.3%)	15 (1.2%)
	Separate – distance.	117 (10.8%)	70 (4.5%)	35 (2.9%)
	Ending of relationship.	-	13 (.8%)	80 (6.5%)

General AVATAR Therapeutic Techniques	Positive statement on recovery (voice specific).	1 (.1%)	19 (1.2%)	17 (1.4%)
	Problem Solving (voice specific).	-	6 (.4%)	26 (2.1%)
	Check in (emotional state, distress, coping). **	-	-	-
	Coping with dialogue with avatar.*	69 (6.4%)	19 (1.2%)	15 (1.2%)
	Distressed with dialogue with avatar. *	13 (1.2%)	7 (.4%)	5 (.4%)
	Invites direction of therapy and/or to open up dialogue.	-	-	-
	Participant states direction of therapy.*	28 (2.6%)	54 (3.4%)	25 (2%)
	Participant does not state direction of therapy. *	4 (.4%)	15 (1%)	17 (1.4%)
Promote Assertive Responding to voice/avatar	Reinforce.**	-	-	-
	Verbatim instruction. **	-	-	-
	General encouragement (inc. advice). **	-	-	-
Making Sense of Voices	Links voices to inner beliefs.	-	9 (.6%)	10 (.8%)
	Links voices to past adverse experiences (including trauma and loss).	1 (.1%)	5 (.3%)	5 (.4%)
	Voices as internally generated.	-	6 (.4%)	8 (.7%)
	Cost of engaging with voices (inc. participant acknowledgement of unhelpful way of engaging with voices).	-	1 (.1%)	10 (.8%)
Self-Esteem & Self-agency	Ask about positive qualities/Ask what other say/ Ask about functioning.**	-	-	-
	Instil hope (inc. well-wishing).**	-	-	16 (1.3%)
	Positive Evaluation of other.	-	4 (.3%)	2 (.2%)
	Positive self-evaluation (inc. agreement with/what others say)*.	4 (.4%)	126 (8%)	70 (5.7%)
	Positive self-agency (inc. socialising)*.	4 (.4%)	119 (7.6%)	114 (9.3%)
	Participant not convinced of positive evaluation and/or self-agency*.	1 (.1%)	43 (2.7%)	31 (2.5%)
	Normalising. **	-	-	-

CBT Techniques	Goal setting/Identify goals (behavioural specific).	-	22 (1.4%)	37 (3%)
	Validation/empathy. **	-	1 (.1%)	-
Mentalising	Reflection – self or mirroring other's internal world (inc. explanation of own/other behaviour).	7 (.6%)	114 (7.3%)	102 (8.3%)
	Changeability (of one's and/or other's internal world, thoughts, feelings).	3 (.3%)	15 (1%)	22 (1.8%)
	Holding other in mind.	-	-	-
Other codes	Unable to code.	22 (2%)	77 (4.9%)	56 (4.6%)
	Fillers.	216 (19.9%)	267 (17%)	205 (16.7%)
	Repeat/clarify.	39 (3.6%)	80 (5.1%)	56 (4.6%)
	Technical/practical conversation.	29 (2.7%)	23 (1.5%)	29 (2.4%)
	Inaudible interchange.	11 (1%)	3 (.2%)	6 (.5%)
	Thought disordered response.	7 (.6%)	51 (3.2%)	24 (2%)
	Total number of codes	1088	1572	1228

Note.*Participant only code. **Therapist only code.

Appendix 5: Avatar Coding Data

Macro Code	Micro Code	Total Frequency (%)		
		Therapy Session 1	Therapy Session 4	Last Session
Controlling	Demand.	34 (5.5%)	-	-
	Threat (physical).	25 (4%)	-	1 (.1%)
	Threat (psychological).	30 (4.8%)	4 (.3%)	-
	Undermine (instil doubt).	62 (10%)	29 (2.1%)	-
	Holding on/reluctance to change relationship style.	67 (10.8%)	18 (1.3%)	8 (.7%)
	Abuse/insult/negative evaluation of other.	161 (25.9%)	14 (1%)	-
Autonomy Giving	Advice giving.	-	41 (2.9%)	31 (2.7%)
	Negotiate/move towards emancipation.	58 (9.3%)	129 (9.2%)	63 (5.6%)
	Concession of power.	6 (1%)	85 (6%)	73 (6.4%)
	Acknowledgment of change.	29 (4.7%)	52 (3.7%)	44 (3.9%)
	Intrigue (express positive surprise about change).	68 (11%)	41 (2.9%)	8 (.7%)
Submissiveness	Speechless/hesitant.	1 (.2%)	1 (.1%)	1 (.1%)
	Helpless (inc. reliance on others).	1 (.2%)	-	1 (.1%)
	Appeasement.	-	2 (.1%)	4 (.4%)
	Ambivalence of ending relationship.	-	-	3 (.3%)
	Request advice/guidance.	1 (.2%)	15 (1.1%)	10 (.9%)
	Apology.	-	34 (2.4%)	19 (1.7%)
Autonomy Asserting	Downplays threat/coping/reduce impact.	-	-	
	Challenge/dismiss other's assertion.	-	-	
	Increase power.	-	-	
	Self-agency.	-	-	-
	Separate – disaffiliate.	-	1 (.1%)	-
	Separate – distance.	2 (.3%)	2 (.1%)	-
	Ending of relationship.	-	11 (.8%)	69 (6.1%)

General AVATAR Therapeutic Techniques	Positive statement on recovery (voice specific).	-	9 (.6%)	18 (1.6%)
	Problem Solving (voice specific).	-	18 (1.3%)	36 (3.2%)
	Check in (emotional state, distress, coping). **	-	2 (.1%)	2 (.2%)
	Coping with dialogue with avatar.*	-	-	-
	Distressed with dialogue with avatar. *	-	-	-
	Invites direction of Therapy and/or to open up dialogue.	6 (1%)	42 (3%)	33 (2.9%)
	Participant states direction of therapy.*	-	-	-
	Participant does not state direction of therapy. *	-	-	-
Promote Assertive Responding to voice/ avatar	Reinforce.**	1 (.2%)	-	-
	Verbatim instruction. **	-	-	-
	General encouragement (inc. advice). **	-	-	-
Making Sense of Voices	Links voices to inner beliefs.	4 (.6%)	28 (2%)	21 (1.9%)
	Links voices to past adverse experiences (including trauma and loss).	-	10 (.7%)	7 (.6%)
	Voices as internally generated.	-	6 (.4%)	7 (.6%)
	Cost of engaging with voices (inc. participant acknowledgement of unhelpful way of engaging with voices).	2 (.3%)	6 (.4%)	1 (.1%)
Self-Esteem & Self-Agency	Ask about positive qualities/Ask what other say/ Ask about functioning.**	7 (1.1%)	186 (13.2%)	93 (8.2%)
	Instil hope (inc. well-wishing).**	-	32 (2.3%)	76 (6.7%)
	Positive Evaluation of other.	-	112 (8%)	127 (11.2%)
	Positive self-evaluation (inc. agreement with/what others say)*.	-		-
	Positive self-agency (inc. socialising).*	-	-	-
	Participant not convinced of positive evaluation and/or self-agency*.	-	-	-

CBT Techniques	Normalising. **	-	7 (.5%)	3 (.3%)
	Goal setting/Identify goals (behavioural specific).	-	28 (2%)	38 (3.3%)
	Validation/empathy. **	-	32 (2.3%)	15 (1.3%)
Mentalising	Reflection – self or mirroring other's internal world (inc. explanation of own/other behaviour).	7 (1.1%)	146 (10.4%)	115 (10.1%)
	Changeability (of one's and/or other's internal world, thoughts, feelings).	6 (1%)	59 (4.2%)	45 (4%)
	Holding other in mind.	6 (1%)	7 (.5%)	11 (1%)
Other codes	Unable to code.	3 (.5%)	50 (3.6%)	38 (3.3)
	Fillers.	6 (1%)	66 (4.7%)	52 (4.6%)
	Repeat/clarify.	18 (2.9%)	70 (5%)	51 (4.5%)
	Technical/practical conversation.	3 (.5%)	5 (.4%)	7 (.6%)
	Inaudible interchange.	7 (1.1%)	6 (.4%)	4 (.4%)
	Thought disordered response.	-		
	Total number of codes	621	1406	1135

Note.*Participant only code. **Therapist only code.

Appendix 6: Therapist Coding Data

Macro Code	Micro Code	Total Frequency (%)		
		Therapy Session 1	Therapy Session 4	Therapy Session Last
General AVATAR Therapeutic Techniques	Positive statement on recovery (voice specific).	3 (.5%)	-	-
	Problem Solving (voice specific).	-	-	-
	Check in (emotional state, distress, coping). **	88 (15%)	26 (10.9%)	24 (14.6%)
	Coping with dialogue with avatar.*	-	-	
	Distressed with dialogue with avatar. *	-	-	
	Invites direction of Therapy and/or to open up dialogue.	31 (5.1%)	26 (10.9%)	19 (11.6%)
	Participant states direction of therapy.*	-	-	-
	Participant does not state direction of therapy. *	-	-	-
Promote Assertive Responding to voice/ avatar	Reinforce.**	183 (30.2%)	38 (15.9%)	14 (8.5%)
	Verbatim instruction. **	99 (16.4%)	26 (10.9%)	12 (7.3%)
	General encouragement (inc. advice). **	84 (13.9%)	36 (15.1%)	27 (16.5%)
Making Sense of Voices	Links voices to inner beliefs.	-	1 (.4%)	-
	Links voices to past adverse experiences (including trauma and loss).	1 (.2%)	-	-
	Voices as internally generated.	-	-	-
	Cost of engaging with voices (inc. participant acknowledgement of unhelpful way of engaging with voices).	5 (.8%)	3 (1.3%)	11 (6.7%)
Promote Self-Esteem & Self-Agency	Ask about positive qualities/Ask what other say/ Ask about functioning.**	-	-	3 (1.8%)
	Instil hope (inc. well-wishing).**	-	-	-
	Positive Evaluation of other.	-	-	-
	Positive self-evaluation (inc. agreement with/what others say)*.	-	-	-

	Positive self-agency (inc. socialising)*.	-	-	-
	Participant not convinced of positive evaluation and/or self-agency*.	-	-	-
CBT Techniques	Normalising. **	3 (.5%)	-	-
	Goal setting/Identify goals (behavioural specific).	-	-	-
	Validation/empathy. **	7 (1.2%)	3 (1.3%)	-
Mentalising	Reflection – self or mirroring other's internal world (inc. explanation of own/other behaviour).	5 (.8%)	14 (5.9%)	1 (.6%)
	Changeability (of one's and/or other's internal world, thoughts, feelings).	1 (.2%)	3 (1.3%)	-
	Holding other in mind.	-	-	-
Other codes	Unable to code.	5 (.8%)	-	-
	Fillers.	36 (6%)	27 (11.3%)	14 (8.5%)
	Repeat/clarify.	9 (1.5%)	4 (1.7%)	2 (1.2%)
	Technical/practical conversation.	41 (6.8%)	32 (13.4%)	37 (22.6%)
	Inaudible interchange.	1 (.2%)	-	-
	Thought disordered response.	-	-	-
	Total number of codes	605	239	164

Note.*Participant only code. **Therapist only code.