Listening to and believing derogatory and threatening voices

Bryony Sheaves

Lady Margaret Hall, University of Oxford

Submitted for the degree of DPhil in Psychiatry

Hilary Term, 2023

Supervisors:

Professor Daniel Freeman

Dr Louise Johns

Abstract

Background: An appraisal account has been important in understanding and treating the distress of people who hear voices. Over the past 25 years, a substantial body of research has accumulated that supports the view that appraisals concerning malevolence and omnipotence of voices have significant associations with voice-related distress. Each type of appraisal explains approximately a fifth of the variance in distress. Substantial variance in voice-related distress is therefore left unexplained. The aim of this thesis is to extend the appraisal account by focusing on one common presentation of voices: derogatory and threatening voices (DTVs). A cognitive framework is developed to understand a paradox: patients know that these voices intend to upset them, and yet they typically listen to and believe the threats and criticisms heard. Specifically, the objectives were to develop a grounded theory of reasons for listening to and believing DTVs, produce assessment measures to assess key constructs in the approach, test associations between listening to and believing DTVs and distress, and between the reasons and the degree of listening to and believing DTVs and lastly to develop an initial understanding of factors other than appraisals that might lead to greater listening to and believing DTVs.

Method: A lived experience advisory panel collaborated on all aspects of the research programme. In the thesis two National Health Service (NHS) mental health service patient cohorts were recruited: a group of 15 adult patients with non-affective psychosis and daily DTVs was recruited for a qualitative interview study (Chapters Two and Four), and a group of patients who heard DTVs at least once per week (N=591) took part in a cross-sectional observational study (Chapters Three and Five). The qualitative study obtained data via semi-structured interviews, which were analysed using a grounded theory approach to develop the framework of reasons for listening to and believing DTVs (Chapter Two). A systematic search revealed that there were no existing assessment measures for listening to and believing DTVs, or the reasons for doing so. Hence a psychometric study with 591 patients hearing DTVs was conducted. Two new measures were developed: Listening and Believing – Assessment, and Listening and Believing – Reasons. The participant group was made up of two parts for the purpose of exploratory (part A *n*=308) and confirmatory factor analysis (part B *n*=283). A sub-group of 42 part B participants completed test-retest reliability for both measures. Associations between listening to and believing DTVs and distress were tested. Listening and believing DTVs was individually regressed onto each factor (sub-scale) of the reasons for listening to believing DTVs questionnaire. In order to identify the most important reasons for listening to and believing DTVs, accounting for shared variance, structural equation modelling was carried out. Listening to and

believing DTV factors (subscales) were together regressed onto the latent factors of the reasons for listening to and believing DTVs questionnaire. A secondary analysis of the qualitative interview study took place using thematic analysis to learn about the patient experience of social connection (Chapter Four) and its relationship with listening to and believing, because this was a prominent theme across the accounts. Lastly, a sub-group of part B participants (*n*=140) from the cross-sectional observational study completed questionnaires assessing psychological problems that could plausibly contribute to listening to and believing (e.g. boredom, low self-confidence, insomnia). Mediation models assessed whether these psychological problems were associated with listening to and believing DTVs via the reasons for listening to and believing.

Results: Patient interviews identified 21 reasons for listening to and believing DTVs, grouped into six higher order categories: i) to understand the voices (e.g. what is their motive?); ii) to be alert to the threat (e.g. prepared for what might happen); iii) a normal instinct to rely on sensory information; iv) the voices can be of known people; v) the DTVs use strategies (e.g. repetition) to capture attention; and vi) patients feel so worn down it is hard to resist the voice experience (e.g. too mentally defeated to dismiss comments) (Chapter Two). Listening and believing formed four factors: active listening, passive listening, believing, and disregarding DTVs (Chapter Three). 58% (*n*=332) of participants passively listened to their voices very often, and 52% (*n*=307) believed their DTVs very often. Actively listening out for voices was less common, occurring very often for a third of patients. Higher levels of believing, active listening, and particularly passive listening, were associated with higher levels of anxiety, depression, and voice-related distress. Passive listening explained approximately one-quarter of the variance in depression and anxiety, and believing DTVs explained approximately a fifth of the variance. Reasons for listening to and believing formed seven factors: to better understand the threat; being too worn down to resist; to learn something insightful; being alone with time to listen; voices trying to capture attention; voices sounding like real people; and voices sounding like known people (Chapter Three). Each type of reason was associated with active listening, passive listening, and believing. The structural equation model (SEM) explained 70% of the variance in passive listening, 52% in believing, and 46% in active listening. The SEM showed that feeling worn down in particular accounted for listening to and believing DTVs. Test-retest reliabilities of both measures (Listening and Believing - Assessment, and Listening and Believing – Reasons) were excellent. The secondary analysis of the qualitative interviews showed that withdrawing from people was a common response to hearing DTVs, but also a time of vulnerability for listening to and believing the voices (Chapter Four). Ten reasons were outlined why hearing DTVs led to lower social connection, including voices leading to difficulties during conversations (e.g. the concentration required is hard), negative expectations of interactions (e.g. fearing judgement from others), and difficulties sharing experiences of hearing

voices (e.g., people will be hurt or upset if I tell them about the voices). A sub-group of participants had found ways to reconnect with people and noted the benefits on the experience of DTVs. The sub-group analysis of the cross-sectional study identified additional common psychological problems for people experiencing DTVs: very strongly held negative self-beliefs, high levels of inactivity, insomnia, and weekly nightmares occurred in at least two-thirds of the participant group. Worn-down appraisals mediated the individual cross-sectional relationship between insomnia, boredom, negative self-beliefs, and listening to and believing DTVs.

Conclusions: Listening to and believing DTVs is a new framework for extending the understanding of voice distress. Listening to and believing DTVs was found to be a common occurrence, a problem that patients identified with, and was associated with higher levels of emotional distress. The motivations to listen to and believe DTVs were readily elicited from patients. Seven groups of reasons each predicted the degree of listening to and believing DTVs, and hence could act as treatment targets for a psychological intervention drawing on the framework. Appraisals related to being worn down might be particularly important to target. Limitations of the research are that listening to and believing each accounted for only a minority of the variance in emotional distress. Hence the majority of variance in distress for people hearing DTVs remains unexplained. It is possible that listening to and believing DTVs are associated with other unmeasured negative outcomes (e.g. confusion from voices, and paranoid thoughts). The second substantial limitation is the cross-sectional design which meant that it was not possible to determine the direction of pathways between either listening and believing and distress, or between the appraisals and listening and believing. Further work is required to investigate whether the variance in distress that is explained by the new framework is shared with existing appraisal measures (e.g. malevolence and omnipotence), or whether the new framework explains additional unique variance. A clear next step is to develop psychological treatment techniques that target the seven appraisal groups and assess whether these can be changed and whether this leads to a lessening of the degree of listening to and believing DTVs.

Declaration

The work described in this thesis was carried out between June 2017 and March 2023 under the supervision of Professor Daniel Freeman and Dr. Louise Johns. The work in this thesis is the candidate's own, with the exceptions listed below:

- In Chapter Two a clinical psychologist who specialises in psychosis research (Dr. Louise Isham) acted as a second rater for one qualitative interview in order to enhance the credibility of ratings. A lived experience advisory panel (LEAP) consulted on the topic guide, and the analysis in order to ensure that the patient experience is reflected in the development of the grounded theory. The analysis was supervised by a qualitative research expert (Dr. Laura Griffith).
- In Chapter Three, the LEAP provided question phrasing for the questionnaire item pools. A research assistant (Emily Bold) managed the data collection for the study whilst the DPhil candidate was on maternity leave (August 2020-June 2021), under the supervision of a research clinical psychologist (Dr. Emma Černis). Two research assistants (RAs; Imogen Kilcoyne and Sapphira McBride) completed some of the data entry and a third RA (Rachel Batchelor) helped with setting up some of the online surveys required to run the study through the COVID-19 pandemic (114 surveys were required in total for each part of the study across 38 NHS Trusts). In Chapter Three, the statistical analysis was supervised by a psychometrician (Dr. Aiden B S Loe), who also provided R code for the regularised structural equation modelling. Dr. Loe completed the analysis testing the simple regressions between listening to and believing DTVs and distress, after controlling for four diagnostic groups (borderline personality disorder, depressive episode/disorder, psychosis, and schizophrenia) because this analysis was requested by reviewers through the peer review process whilst the candidate was on maternity leave. The LEAP aided the interpretation of the results.
- In Chapter Four, a clinical psychologist who specialises in psychosis research (Dr. Emma Černis) acted as a second rater for one qualitative interview to enhance the credibility of ratings. The LEAP consulted on the analysis in order to ensure that the patient experience is reflected in the thematic analysis. The analysis was supervised by a qualitative research expert (Dr. Laura Griffith).

- In Chapter Five, the statistical analysis was supervised by a psychometrician (Dr. Aiden B S Loe) and the LEAP aided interpretation of the results.

I declare that the work presented in this thesis has not been submitted for any other degree, in this or any other university or institute of learning.

This DPhil was funded by a National Institute of Health Research / Higher Education England Clinical Doctoral Research Fellowship awarded to BS (ICA-CDRF-2017-03-088). This thesis presents independent research funded by the National Institute of Health Research (NIHR)/Higher Education England (HEE). The views expressed are those of the author and not necessarily those of the NHS, HEE, the NIHR, or the Department of Health and Social Care. The funding sources had no role in the study design, collection, analysis, or interpretation of the data, writing the manuscript, or decisions to submit papers for publication.

Acknowledgements

First and foremost, I would like to extend my gratitude to the participants from my qualitative study who generously and openly shared their personal stories of hearing derogatory and threatening voices. Thank you all for trusting me with your story. And thank you the McPin Hearing Voices Lived Experience Advisory Panel for sharing your expertise, for your dedication to, and thoughtfulness around this programme of research.

I owe an enormously debt of thanks to my supervisors, Professor Daniel Freeman and Dr Louise Johns, and psychometric consultant Dr Aiden Loe. Thank you for being so excellent, endlessly patient, and for teaching me such a great deal. Completing a PhD through a pandemic and with two periods of maternity leave added an 'extra element' to the experience and I feel enormously grateful to have been so incredibly well supported – thank you. Emily Bold and Dr. Emma Černis, thank you for continuing the data collection through my maternity leave. It was wonderful to leave the study in such excellent hands.

Thank you to the 38 NHS sites, the Clinical Research Network (CRN) teams and the site Principle Investigators for collecting data for Chapter Three, and to Dr Andrew Molodynski for support navigating the CRN system, particularly through the pandemic.

Thank you to the team at the McPin Foundation - Rachel Temple, Tillie Cryer, Anja Hollowell, and Thomas Kabir - for facilitating such inspiring lived experience advisory panel meetings, and your thoughtfulness to ensure that everyone felt supported to contribute, and safe enough to gently challenge each others ideas.

Thank you to the wider O-CAP team for always inspiring excellence. And particular thanks to my DPhil and office buddy Dr Louise Isham. This journey wouldn't have been so fun without you!

Lastly, but most significantly, thank you to Tom for being an endlessly supportive husband, and being such an incredible Dad to allow me to write whilst knowing that the kids were having the best time with you. And to Farley and Elodie for being so patient whilst mummy writes.

This thesis is dedicated to my late grandmother – Dr Barbara Sheaves ('Bubbles'), for showing me the enjoyment that can be had from learning.

Table of Contents

Introduction: Developing a framework to extend the appraisal account of voice distress 10

The definition and phenomenology of voice hearing 11

Clinical and economic correlates of hearing distressing voices 12

Voice hearing across diagnostic boundaries 13

Psychological mechanisms hypothesised to underlie voices 14

Cognitive appraisals as causal mechanisms for voice outcomes 16

The current research 18

The Oxford Approach to the development of evidence-based cognitive therapies 18

Thesis aims 19

Why do patients with psychosis listen to and believe DTVs? 21 reasons given by patients 21

Introduction: 23

Methods: 24

Results: 29

Discussion 45

Listening to and believing DTVs: measure development and a quantitative test of the theory 48

Introduction: 50

Methods: 54

Results: 59

Discussion: 91

The challenges and opportunities of social connection when hearing DTVs: A thematic analysis with patients experiencing psychosis 95

Introduction 97

Methods: 98

Results: 101

Discussion 109

Potential contributors to the reasons for listening to and believing DTVs 112
Introduction 114
Method: 117
Results 122
Discussion 131
Discussion 135
Overview of findings from the thesis 135
Clinical implications 139
Future research directions 143
Limitations 146
Conclusions 149
References 150
Appendices 168
List of appendices 168
A. Full item pool: Listening and Believing – Assessment 169
B. Full item pool: Listening and Believing – Reasons 173
C. Listening and Believing – Assessment 178
D. Listening and Believing – Reasons (28 item full version) 181
E. Listening and Believing – Reasons (16 item short form version) 186
F. Listening and Believing – Reasons (5 item very brief version) 189
G. Adapted version of the Lubben Social Network Scale 190
H. Audit trail of key analysis decisions (Chapter Four) 191
I. Published papers 196

1

Introduction: Developing a framework to extend the appraisal account of voice distress

> "Some really evil [voices] came and they were trying to convince me to kill myself[..] they made themselves out to sound like people were going to break into my house and kick the hell out of me[..] With the evil voices comes an overwhelming sense of fear[..] a fear I've never experienced before[..] the darkest thing I wish I never felt[..] I felt completely helpless and so vulnerable. I was believing it.". (Domicile, 2012)

In 1989 Marius Romme and Sandra Escher initiated a step change in our understanding of voice hearing. They listened in detail to the stories of people who hear voices and noticed that the way that the voice hearer made sense of their voices distinguished between those who coped well with voice hearing, and those who did not (Romme & Escher, 1989). Soon after came empirical support for a central role of cognitive appraisals in determining the response to voice hearing (Birchwood & Chadwick, 1997; Chadwick & Birchwood, 1994), and ultimately the development of an efficacious cognitive therapy for one specific response to a specific voice presentation: reducing harmful acts of compliance with commanding voices (Birchwood et al., 2014).

Despite the currently available treatments, many voice hearers continue to be distressed by their experiences. This thesis set out to develop and empirically evaluate a new framework for understanding voice distress: reasons for listening to and believing derogatory and threatening voices (DTVs). The problem of one's attention being consumed by listening to voices has long been noted. For example, Romme and Escher (1989) observed that people who coped well with hearing voices were more able to ignore them or select what to listen to. And Emile Kraeplin noted that a mark of improvement in patients is that "the hallucinations persist but the patient no longer pays so much attention to them" (p.175, Kraeplin, 1919). Yet the reasons why voices can be so believable and difficult to ignore have not been systematically researched. The theory that is presented and tested within this thesis is that greater listening to and believing DTVs is associated with higher levels of distress. There are likely understandable reasons for listening to and believing DTVs, and these could provide novel psychological intervention targets.

This introductory chapter discusses the background literature supporting the need to extend the appraisal account of voice hearing. It will explore the phenomenology of voice hearing, and outline the clinical and economic impact of voices that require clinical care. Potential underlying causes of voice hearing will be discussed, including the central role of cognitive appraisals in explaining voice distress. Finally, the Oxford Approach to the development of psychological therapies will be outlined as a framework for expanding the understanding of voice distress via the development of a theoretical account to explain why patients listen to and believe DTVs.

The definition and phenomenology of voice hearing

The term "hallucination" has been defined as *"*any percept-like experience which (a) occurs in the absence of an appropriate stimulus, (b) has the full force or impact of the corresponding actual (real) perception, and (c) is not amenable to direct and voluntary control by the experiencer.*"* (Bentall, 1990, p.82; Slade, 1988, p23). Voice hearing is the auditory verbal form of hallucinations. Whilst the term 'auditory verbal hallucination' is commonly used in voice hearing research, it has been resisted by voice hearers who perceive it as "loaded with the assumption that voices are not real and/or that they are best explained in a biomedical manner" (S289, Corstens et al., 2014). Hence the term voice hearing is the preferred term used throughout the programme of research described in this thesis. The word hallucination is reserved for descriptions of previous research.

The diversity of the experience of hearing voices is notable. A century ago Emil Kraeplin worked to characterise dementia praecox, now termed schizophrenia, through detailed clinical observations. His notes on patients' voices describe a broad range of anomalous auditory experiences:

"Sometimes it is only whispering, [..] a secret language, "taunting the captive"; sometimes the voices are loud or suppressed, as from a ventriloquist, or the call of a telephone, "children's voices"; a patient heard "gnats speak". Sometimes they shout as in a chorus [..] another heard "729,000 girls". Sometimes the voices appear to have a metallic sound, they are "resonant voices", "organ voices", or as of a tuning-fork. At other times they do not appear to the patients as sense perceptions at all; they are " voices of conscience," " voices which do not speak with words," voices of dead people" (Kraeplin, 1919)

Since this detailed account, three key observational studies have described the phenomenology of voices (McCarthy-Jones et al., 2014; Nayani & David, 1996a; Woods et al., 2015). These note a range of experiences in terms of the perceived location of the sound source, the volume of speech (from

whispers through normal speech to shouting), the frequency with which they occur, and the level of distinction from the voice hearers' own thoughts (MccCarthy-Jones, Trauer, et al., 2014; Nayani & David, 1996). The majority of people describe hearing multiple voices (81%; Woods et al., 2015). Whilst commonly viewed as an auditory experience, around half of voice hearers report thought-like voices, or mixed auditory and thought-like experiences (Woods et al., 2015). Two-thirds of patients report voices with an identity and in around half of these cases they are perceived to be someone known to them (e.g. a neighbour or relative) (McCarthy-Jones et al., 2014; Nayani & David, 1996a). Whilst voices do clearly represent a perceptual anomaly, they are also often experienced as a genuine communication experience. Just as with other communications, the messages received via voices differ: some people hear voices that are helpful, insightful and inspiring, whilst others hear voices which are commanding, abusive, threatening or derogatory (McCarthy-Jones et al., 2014).

Voice hearing is more common in the general population than once thought with a lifetime prevalence of 10% (Maijer et al., 2018). However a meta-analysis has shown that rates differ according to age: around 12-13% of children and adolescents experience voices, but this drops significantly to 6% of adults and 5% of older adults (Maijer et al., 2018). Only a minority (15%) of children experience distress or problem behaviour as a result of voice hearing (Bartels-Velthuis et al., 2010) suggesting that voices may form a typical part of development for most young people who experience them. The mean age of onset for people who experience voices in the context of a mental health diagnosis is in the early twenties (MccCarthy-Jones, Trauer, et al., 2014). Of those who receive a diagnosis of schizophrenia, around half will experience voices that persist over a 20-year period (Goghari & Harrow, 2016).

Before medicalised interpretations of voice hearing, they were mostly appraised within a religious framework as representing messages from God or the Devil (Saunders, 2015). Within this framework, voice hearing was viewed as explicable and, depending on the content, for some even welcomed (Saunders, 2015). There are now multiple frameworks for understanding voice hearing. The experience of hearing a voice in the absence of an external stimulus is termed voice hearing for some, and mediumship and clairaudience for others. For the latter, it is a valued skill, yet for the former, it can be associated with psychological distress, a mental health diagnosis, and a need for treatment.

Clinical and economic correlates of hearing distressing voices

Hearing voices frequently within the context of a mental health diagnosis is associated with a range of poor outcomes. Anxiety, depression, shame and sadness are common emotional responses (Woods

et al., 2015). The stress of stigma can lead to social isolation (Xu et al., 2016). Employment is the exception rather than the rule, with rates as low as 10% (Evensen et al., 2016; National Collaborating Centre for Mental Health, 2014). Of concern, hallucinations increase the risk of suicide (Hor & Taylor, 2010). This association holds across adult and adolescent groups. In the latter, voice hearing is associated with three to four times greater odds of a suicide attempt (Fujita et al., 2015). The high severity and persistence of voices over time is one reason why schizophrenia (a diagnosis within which the majority of patients report hallucinations) is ranked 15th in the global burden of disease (GBD 2016 Disease and Injury Incidence and Prevalence Collaborators, 2017). The annual economic burden is therefore high, estimated to be £13.8 billion (Kirkbride et al., 2011). The majority of this cost is attributable to NHS care, particularly the high number of admissions to psychiatric inpatient wards, and lost employment (Kirkbride et al., 2011).

Voice hearing across diagnostic boundaries

Voice hearing is a key symptom of psychotic disorders, occurring in around 64-80% of patients with a diagnosis of schizophrenia (Kingdon et al., 2010; McCarthy-Jones et al., 2017). Hence voices have been seen as synonymous with a schizophrenia diagnosis. Yet voices are now widely recognised to occur in the context of several other mental health problems too. For example, half of those with borderline personality disorder (BPD) experience voices (Kingdon et al., 2010). There is evidence that voices heard by people with BPD have significantly more negative content, are louder and result in more distress when compared to voices heard by people with a schizophrenia diagnosis, yet they occur with a similar frequency and duration (Kingdon et al., 2010). Hallucinations are also a part of the clinical presentation of more than 10% of those diagnosed with anxiety disorders (Kelleher & Devylder, 2017) and 7% of those experiencing a current major depressive episode (Ohayon & Schatzberg, 2002). There is evidence that rates of hallucinations may be elevated in those with a diagnosis of bipolar disorder (Baethge et al., 2005), yet further research is required to offer precise prevalence estimates.

Hallucinatory experiences outside of psychosis are frequently overlooked as a treatment target and have received markedly less scientific scrutiny. This may in part be due to a problem with language and understanding. They are commonly referred to as pseudo-hallucinations. The term was first intended by Viktor Kandinsky to recognise the greater levels of insight that typically accompany non-psychotic hallucinations, but given that ‘pseudo’ is commonly used to mean ‘not genuine’, the result has been that these experiences are often not seen as a treatment priority. The limited scientific research literature demonstrates that pseudo-hallucinations are poorly differentiated from ‘true’

hallucinations (Zwaard & Polak, 2001), and the term downplays the comparable levels of frequency and distress associated with psychotic and non-psychotic auditory hallucinations (Schutte et al., 2020). The paralleled importance of appraisals in determining distress and response to voices (Cavelti et al., 2019) suggests that distressing 'non-psychotic' voices may be amenable to cognitive therapy. A transdiagnostic approach to the study of voice hearing is both more inclusive and better addresses the true breadth of the clinical problem.

Psychological mechanisms hypothesised to underlie voices

The cause of voice hearing is multifactorial, likely occurring as a result of changes in genetic, neurobiological, environmental and psychological processes. Consistent with the multifactorial view of the causation of voice hearing, patients also perceive a range of factors to cause their symptoms, including environmental factors (experiences of abuse and childhood bullying), existing psychological difficulties (emotional difficulties and sleep problems), and the contribution of a genetic vulnerability (Dudley et al., 2009; Romme & Escher, 1989). It is therefore most likely that there are multiple interacting causal factors accounting for the occurrence of voices. Studying each of these factors individually affords an opportunity to isolate the potential causal variable and assess its effect on voice hearing. In essence, asking: does this variable increase the likelihood of voices occurring? If true, the variable acts as "insufficient, but necessary parts of an unnecessary but sufficient (INUS) condition" (Mackie, 1965). An INUS condition can increase the risk of voices occurring, but does not cause them without the presence of other causal factors. Two examples of potential INUS conditions for voice hearing are insomnia and PTSD, both of which may lead to voice hearing via increasing negative affect.

There is accumulating evidence that insomnia is a causal contributor to the occurrence of hallucinations generally, but voices specifically have received less attention. Cross-sectionally, the severity of insomnia and the occurrence of hallucinations increase in a dose-responsive manner (Sheaves et al., 2016). There are also longitudinal data indicating that baseline insomnia predicts later new inceptions of hallucinations after controlling for depression, anxiety, and paranoia (Sheaves et al., 2016). But the most convincing evidence for a causal role for insomnia in the occurrence of hallucinatory experiences comes from studies that manipulate sleep and assess the impact on hallucinations. In a randomised controlled trial (the OASIS trial), 3755 university students with insomnia were randomly allocated to digital cognitive behaviour therapy (CBT) for insomnia or usual care. It was found that effectively treating insomnia led to small but significant reductions in hallucinations, and a fifth of the change in hallucinatory experiences at week 10 was mediated by the

change in insomnia at week three (Freeman et al., 2017a). Conversely, an experimental manipulation study showed that sub-clinical increases in hallucinations can be brought about by restricting sleep duration (Reeve, Emsley, et al., 2018). Negative affect was a partial mediator of the relationship. Sleep disruption is clearly one causal factor in the occurrence of hallucinations, albeit having a small magnitude of effect on their occurrence. And further research isolating voice hearing from other forms of hallucinations is needed.

Experience of trauma - particularly childhood trauma - is higher in people with clinical psychotic experiences and also those without a need for care (Peters et al., 2016) suggesting that trauma may play a causal role in the occurrence of psychotic experience per se, rather than the distress associated with them. The negative sequelae of traumatic experiences are evident in clinical samples with psychosis where a significant minority (16%) screen positive for co-occurring PTSD (de Bont et al., 2015). Of those with psychosis who have experienced trauma, 58% report either thematic links or direct content links between their voices and their experience of trauma (Hardy et al., 2005). PTSD symptoms mediate the relationship between developmental trauma and hallucinations (Bloomfield et al., 2021) and are amenable to psychological interventions for patients with psychosis (van den Berg et al., 2015), with trauma memory exposure potentially being a core therapy ingredient for improvement in PTSD (Peters et al., 2022; Steel et al., 2017). Within the van den Berg et al (2015) trial two-thirds of the participants did not experience voices at baseline, hence the trial is not designed to assess whether PTSD has a causal role in voice hearing. However two recent case series have tested psychological interventions specifically for people who report links between their trauma and voices, with promising effects on both PTSD symptoms and voice severity (Brand et al., 2021; Paulik et al., 2019). A forthcoming large (N=300) multi-site randomised controlled trial will assess the effect of PTSD treatment when compared with treatment as usual on hallucinations as a secondary outcome (Peters et al., 2022). This will be the largest test of PTSD treatment for people with co-occurring psychosis, and will likely provide the most methodologically rigorous assessment of the potential causal role of PTSD in voice hearing to date.

An influential theory of voice hearing posits that voices result from inner speech being misattributed to an external event, and hence reflect a problem of the internal source monitoring system (Frith, 1987). In support of this theoretical perspective, there is experimental evidence that precluding the opportunity for sub-vocalisation (and hence inner speech) via humming reduces the occurrence of voices (Green & Kinsbourne, 1989, 1990). This coping strategy is introduced in CBT interventions as a means of increasing control over voices (Meaden et al., 2013), which can be beneficial as part of a

wider repertoire of coping strategies. There is also evidence that those who experience auditory hallucinations have a greater tendency to misattribute internally generated words to an external source than both those with other psychiatric problems and non-clinical controls (Bentall et al., 1991). Experimental evidence suggests that this external attribution bias is impacted by the level of self-focused attention of the patient (Ensum & Morrison, 2003). Building on the theory that source monitoring deficits are one mechanism underpinning voices, Morrison (1995) theorised that voices result from the misattribution of ego-dystonic, unwanted, or uncontrollable thoughts to an external source. Positive beliefs about unusual experiences predict a predisposition to auditory hallucinations in healthy participants (Morrison et al., 2000), and therefore may bias an individual to attribute internal events to an external source. Studies that manipulate positive beliefs about unusual experiences and assess the impact on the occurrence of voices are now needed to fully investigate their potential causal role.

Cognitive appraisals as causal mechanisms for voice outcomes

The mechanisms that have received the greatest attention from psychologists are cognitive appraisals because they are amenable to psychological interventions (Turner et al., 2020). In their seminal paper Chadwick and Birchwood (1994) sought to understand the diversity in patients' emotional and behavioural responses to voices by investigating the connection between voice content and form, and the patients' cognitive, affective, and behavioural responses. A cognitive analysis of interviews with voice hearers revealed three groups of appraisals: omnipotence, omniscience, and malevolence. These were linked to responses to voices: those appraised as evil or malevolent for example provoked fear and resistance towards the voice(s), whilst those appraised as benevolent provoke engagement with voices (Chadwick & Birchwood, 1994). This work underscored the applicability of cognitive therapy to target unhelpful emotional and behavioural responses to voices and led to the development of cognitive models of positive psychotic symptoms, which could be used to target voices (Garety et al., 2001; Morrison, 2001).

The best evidence for the causal role of cognitive appraisals in voice outcomes comes from the COMMAND trial (Birchwood et al., 2014). In the trial, targeting voice omnipotence appraisals led to a halving of compliance with harmful command hallucinations, compared with treatment as usual alone. Mediation analysis confirmed that voice power was the mechanism explaining the treatment effect on compliance (Birchwood et al., 2018). This demonstrates that a specific set of appraisals has a causal role in whether or not voice hearers obey the harmful commands that their voices make.

Taking voice distress, i.e. a different outcome, power and malevolence beliefs have been the most investigated appraisals. In a meta-analysis, the degree of voice malevolence and omnipotence have large and medium associations with voice-related distress respectively (Tsang et al., 2021). Voice power explained 13% of the variance in distress, whilst malevolence explained 21% of the variance. Interventionist causal tests provide the best quality evidence for establishing a causal relationship. Whilst the COMMAND trial demonstrated that voice power appraisals are amenable to cognitive therapy, concomitant reductions in voice-related distress were not observed (Birchwood et al., 2014), calling into question their causal role in determining the severity of voice distress.

An RCT shows that AVATAR therapy, a brief appraisal-type intervention, leads to large effect size reductions in voice severity, and significant reductions in voice distress compared to supportive counselling at 12 weeks, though the effect was not sustained at follow-up (Craig et al., 2018a). Within treatment the therapist enacts verbatim voice content which is delivered at the same time as a personalised visual representation of the voices, hence providing the patient with a computerised audio-visual AVATAR. Voice power appraisals were significantly reduced in the intervention group when compared to the supportive counselling group (Craig et al., 2018a). Whilst this is consistent with the view that omnipotence appraisals fuel distress in voice hearers, it is notable that there are nine other treatment targets (e.g. improving self-esteem, fostering compassion towards the voice; Ward et al., 2020) which may also be causal mechanisms for voice distress. The high number of theorised mechanisms for the treatment likely reflects the diversity of voice presentations which can give rise to a more severe assessment of voices. The mechanisms fuelling distress likely differ to some degree across these different voice presentations. Including such a range of potential treatment targets makes the treatment inclusive and relevant to patients experiencing a broad range of distressing voices. However, because omnipotence appraisals are not manipulated in isolation via the treatment, it is not possible to draw strong conclusions regarding the role of omnipotence appraisals in voice distress from this trial. As yet, the ten potential treatment mechanisms have not been quantitatively assessed in terms of their relationship with voice outcomes.

The relevance of appraisal theory to voice hearing is now well established, particularly in relation to compliance with harmful commands made by voices. There is clearly a cross-sectional association between malevolence and omnipotence appraisals and voice distress, but further manipulation studies are needed that test the hypothesis that targeting these appraisals reduces voice-related distress. In addition, the majority of variance in voice distress remains unexplained by power and omnipotence appraisals in the cross-sectional studies. Hence, further investigation of appraisals

underpinning voice distress is required. It is plausible that other, yet-to-be-identified appraisals explain variance in distress, and these could provide a further target for cognitive behavioural interventions. One obvious set of appraisals to investigate are those that underpin the distress caused by negative voices specifically.

Over the past decade, there has been a growing interest in the predictive value of voice content in determining clinical status and voice distress. For example, clinical versus healthy voice hearing can be predicted based on the emotional valence of voice content alone with a sensitivity of 86%, specificity of 87%, and 88% positive predictive value (Daalman et al., 2011). The amount and degree of negative content have closer associations with voice distress than other variables such as the perceived location or degree of control over voices (Pappa et al., 2021). The valence of voice content, as assessed by an independent rater (blinded to clinical status) predicted the amount of distress, and disruption to life (de Boer et al., 2021), and in separate studies negative voice content predicted depression (Rosen, Mccarthy-jones, Jones, Chase, & Sharma, 2018), low self-esteem (Smith et al., 2006) and psychological stress reactivity (Baumeister et al., 2022).

The current research

The single-symptom research reviewed within this chapter has resulted in a step-change in the psychological understanding of psychosis, and this has been translated into more efficacious cognitive therapies. The COMMAND trial (Birchwood et al., 2014) is the clearest demonstration that targeting precise cognitive mechanisms associated with one specific voice presentation can lead to greater patient benefit. The results from COMMAND suggest that even within individual psychotic symptoms, isolating the core phenomena of interest by focusing on one specific voice presentation might enhance the understanding of mechanisms underpinning the experience. The current programme of research, therefore, focuses on negative voices and specifically isolates those which make derogatory and/or threatening comments (derogatory and threatening voices; DTVs). A majority of voice hearers endorse experiencing DTVs (McCarthy-Jones et al., 2014; Nayani & David, 1996a; Scott et al., 2020). This thesis sets out to explain a paradox: patients typically know that their voices intend to upset them, and yet they typically listen to and believe the negative things that they hear.

The Oxford Approach to the development of evidence-based cognitive therapies

The successful development of treatments for the anxiety disorders provides a research framework to improve outcomes for voices too. Panic disorder, social phobia, and post-traumatic stress disorder are now eminently treatable mental health problems (Clark, 2004). The therapies are first-line

recommended treatments within NICE guidelines and are delivered at scale to those who need them through England's Increasing Access to Psychological Therapies Programme (Clark, 2018). The research process from cognitive theory to randomised controlled trial has been outlined (Clark, 2004), with a detailed illustrative example for PTSD (Ehlers & Clark, 2008). The first step is to conduct clinical interviews to understand the core cognitive processes associated with the presenting problem. The second is to develop a theoretical account to explain why the presenting problem does not self-correct (a maintenance model, E.g. for PTSD: (Ehlers & Clark, 2000). Third, the maintaining factors are tested through experimental manipulation and the outcome on the presenting problem is assessed (McManus, Sacadura, & Clark, 2008). Fourth treatments are developed which reduce the maintaining factors and lastly, these treatments are tested in randomised controlled trials (Clark et al., 1994). This approach has now successfully been translated into psychosis through the development of cognitive therapy for persecutory delusions (Freeman, 2016; Freeman et al., 2021). The Feeling Safe programme is based on extensive research which has identified that insomnia (Freeman et al., 2017a), worry (Freeman, Dunn, et al., 2015), and safety-seeking behaviours (Freeman, Bradley, Antley, et al., 2016) for example are causally related to the occurrence of paranoia. These factors are then targeted in treatment. The primary outcome is specific: the degree of conviction in the persecutory delusion. This thesis aims to apply the first two steps of the Oxford Approach to the development of cognitive therapies for the problem of hearing DTVs. To test the theory quantitatively, outcome measures are developed to assess key constructs within the approach.

Thesis aims

This thesis aimed to develop and test a new cognitive framework to understand voice distress for patients who hear threatening or derogatory voices. Criticisms and threats are one of the most common types of negative remarks made by voices. The theoretical perspective is that if the voice hearer listens to and believes this content, this will escalate distress. Yet there are likely understandable reasons to listen to and believe, and these may provide novel psychological intervention targets.

A LEAP was formed to collaborate on the research programme. The purpose was to ensure that the research and its outputs were acceptable and relevant to those with lived experience and to enhance the quality of the theory. Lived experience involvement has been highlighted as particularly crucial for voice hearing research where there is a history of voice hearers being marginalised with respect to key decisions relating to them (Corstens et al., 2014). This research instead follows calls, particularly advocated by the hearing voices movement, to follow the principle of "nothing about us without us"

(Corstens et al., 2014). Hence people with lived experience of hearing voices were involved in all stages of the research.

The following objectives will be examined in the thesis:

1. Use qualitative interviews to learn from patients about the reasons (or appraisals underpinning) why they listen to and believe DTVs (Chapter Two);
2. Develop outcome measures to assess two new concepts integral to the psychological account (Chapter Three):
    a. the *degree* of listening to and believing DTVs;
    b. the *reasons* for listening to and believing DTVs;
3. Test whether listening to and believing DTVs is associated with greater distress (Chapter Three);
4. Test whether the reasons for listening to and believing DTVs are associated with greater listening to and believing DTVs (Chapter Three);
5. To develop an initial understanding of factors other than appraisals that lead to greater listening to and believing DTVs (Chapters Four and Five).

2

Why do patients with psychosis listen to and believe DTVs? 21 reasons given by patients

Abstract:

Rationale: In Chapter One the importance was highlighted of cognitive appraisals in determining the emotional and behavioural response to voices. Yet key appraisals investigated to date – malevolence and omnipotence beliefs – each explain no more than a fifth of the variance in voice distress. In this chapter, the first step is taken in extending the cognitive understanding of voice distress by building a new framework: the reasons for listening to and believing DTVs. The aim was to learn from patients about the reasons why they listen to and believe voices that are appraised as malevolent. Method: Theoretical sampling was used to recruit 15 participants with non-affective psychosis from NHS services who heard daily DTVs. Data were obtained by semi-structured interviews and analysed using grounded theory. Results: Six higher order categories for why patients listen and/or believe voices were theorised. These were: i) to understand the voices (e.g. what is their motive?); ii) to be alert to the threat (e.g. prepared for what might happen); iii) a normal instinct to rely on sensory information; iv) the voices can be of people they know; v) the DTVs use strategies (e.g. repetition) to capture attention; vi) patients feel so worn down it is hard to resist the voice experience (e.g. too mentally defeated to dismiss comments). In total, 21 reasons were identified, with all participants endorsing multiple reasons. Conclusions: The study generated a wide range of reasons why patients listen to and believe DTVs. These appraisals need to be developed into an assessment measure, and their association with the degree of listening to and believing DTVs assessed.

This chapter is adapted from the journal article attached in Appendix Ia: Sheaves B, Johns L, Griffith L, Isham L, Kabir T, Freeman D. (2020) Why do patients with psychosis listen to and believe derogatory and threatening voices? 21 reasons given by patients. Behavioural and Cognitive Psychotherapy, 48(6): 631-645. doi: 10.1017/S1352465820000429.

Introduction:

Since the clinical observations of Romme and Escher (1989) and the seminal empirical paper by Chadwick and Birchwood (1994) over 25 years ago, a substantial literature has amassed demonstrating that how voice hearers appraise voices affects both the degree of distress experienced and the behavioural response (Birchwood & Chadwick, 1997; Chadwick & Birchwood, 1995; Peters et al., 2012; Varese et al., 2016). Targeting these appraisals using CBT leads to clinical benefits on hallucinations (Turner et al., 2020). One of the most efficacious treatments focuses on one presentation of voices – voices that make harmful commands. It has a specific clinical aim – reducing compliance with such commands, and it targets a specific cognitive mechanism – omnipotence appraisals (Birchwood et al., 2018, 2014).

This chapter focuses on one specific and common voice presentation: DTVs. Around two-thirds of voices make threats or criticisms to the patient (McCarthy-Jones et al., 2014; Nayani & David, 1996a). Voice hearers most often describe these voices as seeming very real (McCarthy-Jones et al., 2014), believable, and difficult to ignore (Romme & Escher, 1989). It is therefore understandable that depression, anxiety and suicidal ideation are common consequences. Yet despite a growing interest in voice content in predicting clinical status, DTVs have not been systematically investigated. The study reported in this chapter aimed to understand a common paradox for people who hear DTVs: most patients know that their voices intend to upset them, and yet they typically listen to and believe the negative things that they hear.

Following the Oxford Approach to the development of effective psychological therapies, a crucial first step is to conduct clinical interviews to understand the core cognitive processes associated with the presenting problem. Qualitative study designs provide a systematic means of learning in detail about the psychological processes at play for a presenting clinical problem and have proven informative for identifying cognitive processes maintaining other psychotic experiences (Isham et al., 2019). In the context of DTVs, the focus is on identifying appraisals that result in listening to and believing derogatory and threatening voice content. Hence this chapter aimed to listen to and learn from patients about the reasons why they listen to and believe DTVs.

Methods:

Participants

A pilot stage of recruitment was used at the start of the study to ensure that a diverse range of perspectives informed the theory generation. A team of psychologists, qualitative methodologists, and lived experience experts chose key characteristics to seek during this phase to ensure diversity in the level of experience managing the DTVs, level of severity of DTVs, and level of functioning. The resulting list of variables was: age, duration of hearing voices, and employment status. Inpatient or outpatient status was also a criterion, however, it proved difficult to identify inpatients who felt able to talk about their voice hearing. After this pilot stage, theoretical sampling was used to recruit participants who hear DTVs. Interviews were analysed concurrently with recruitment such that subsequent sampling was driven by the emerging theory and testing of it. A maximum of 20 participants was sought, however theoretical saturation (Corbin & Strauss, 2015) was felt to have been reached by 15 participants and hence recruitment ceased. Theoretical saturation was defined as no new reasons for listening to or believing voices emerging from the data, and that each reason was sufficiently saturated and elaborated. The final new reason was coded at participant 13, though recoding revealed that the code was also relevant (albeit less centrally) to earlier participants. Two subsequent participants revealed no new reasons.

Participants were recruited from Oxford Health NHS Foundation Trust. Participants were sought from clinical teams who referred patients to BS, who completed a telephone screening with the referrer and the potential participant. Inclusion criteria were: daily experience (either current or past) of DTVs; experience of DTVs for at least three months; a willingness and ability to recall and discuss their experience in detail; fluent in English; age 18-65; willingness and ability to provide informed consent. Exclusion criteria were: moderate to severe learning disability; voices caused by an organic syndrome (e.g. dementia, significant head injury) and voices occurring solely within the context of substance misuse, personality disorder, or a mood episode (depression or mania).

Procedure

The study was reviewed and approved by an NHS research ethics committee (ref: 18/SC/0443). An audio-recorded semi-structured interview was conducted using a topic guide by BS. BS is a clinical psychologist who has worked with people who have experience of hearing voices. The participants' expertise through their experience was emphasised within the preamble to minimise any potential

power imbalance within the interview. The interviewer's interpretation of the description was checked using pocket summaries. The final category structure was analysed by a patient advisory group to ensure that the structure was coherent from the perspective of those with lived experience of hearing threatening and derogatory voices.

The interview intended to generate the participants' detailed descriptions of their experience rather than merely responding to closed questions. The topic guide was intentionally broad rather than focusing solely on reasons for listening to and believing DTVs. This was to first learn about the lived experience of listening to and believing DTVs more broadly to aid accurate analysis, and to maximise learning for the potential later creation of a suitable psychological treatment. The analysis presented within this Chapter focused on the reasons for listening to and believing DTVs. Following the interviews, the audio recordings were transcribed verbatim by an external transcription company. A qualitative methodologist (LG) consulted on the protocol, topic guide, emerging categories from an early interview, and the subsequent coding framework.

The semi-structured interview topic guide (edits were made in accordance with the emerging theory):

We'll now move on to the interview section of the meeting. This is an opportunity to share, in your own words what it is like experiencing negative or threatening voices. People use many different words to describe these voices, like 'abusive', 'negative', or 'harmful' – what word would like us to use to describe these voice(s)?

Ok, thank you, so we'll describe the voice(s) as the ' ……[insert participant's word]' voice(s).'

This part of the meeting is all focused on the ….. voice(s). I'm interested in all aspects of your experience, but my key interest is what it is that makes voices so convincing and believable, and what makes them difficult to ignore. Whilst I have some questions here to guide us, I am interested in anything which is particularly important to your experience - your own story. We can therefore use these questions flexibly.

These sorts of interviews are different to day-to-day conversations in that it may feel like you are talking more and me much less. This is very usual, but if it feels uncomfortable just let me know. Equally, if there are any questions that you find upsetting please do let me know, we don't want the

interview to be a difficult experience for you so we could pause, move onto a new topic or stop completely at any time.

Before starting some people find it helpful to know a bit about me. I am a clinical psychologist, which means I offer CBT - a kind of talking therapy. I work within a research team where we aim to design CBT therapies that are more helpful for people. I am currently focused on developing treatments for people who hear abusive voices, and this is the purpose of speaking to you today so that we can learn how we might better help people.

i) I wonder if you could start by telling me your story of hearing voices. You can start wherever seems right to you.

PROMPTS

-"When did the voice(s) start?"

-"Do you feel able to share what the voices say/said?"

-"What do/did the voices sound like?"

-"Do/did you experience visions, smells, tastes, or touch related to these voices specifically?"

-"Do/did they have an identity?"

-"How do you make sense of the voices?"

-Why do you think that you hear them?"

-"Where are the voices?"

-"Can other people hear the voices that you hear?"

-"Do/did you think anything triggered the voices in the past?"

-"Do/did they relate to your experiences?"

-"Did you tell anyone about hearing voices?" "what was that like?"

-"What was it like first making contact with mental health services?".

ii) Identify cognitions driving engagement with voices: *"when do/did you find you listen(ed) to them?"*, "*why?"*

PROMPTS

-"Do/did you believe what the voices say when you hear them? Why / why not?"

-"And what about later, when they may be less intense?"

-"Has anything ever made you question the things that they say?"

-"How would they do what they say they will do?"

-"Have/did you ever thought about not listening to them?"

-If no choice but to listen – "why is that?"

-"How much time do/did you spend listening to them?"

-"Have you ever thought about trying to change their mind?" "why?" "why not?"

-"What have you tried?"

-"Have you been offered medication?" If yes: "Did that have any effect on the voices?"

iii) The consequences of listening to voices: "What happens/happened when you listen to the voice(s)?"

PROMPTS

-"How do/did you feel when you listen to the voices?"

-At the time

-And afterwards

-"What do/did you do?"

-"What do/did you think about yourself / the world / other people?"

iv) Identify fluctuations in experience: "Are/were there times when the voices are better?" "Are/were there times when the voices are particularly bad?"

v) Elicit psychological mechanisms of change: "Why do you think this changes/changed?", "Have you ever thought about dealing with them in a different way? What was that like?"

PROMPTS

-"How do/did you cope with the voices? …And what is that like?"

-For people with past experience of voices: "was there a particular turning point for you, when things became easier?", "Why do you think that was?"

vi) Experience of therapy with voices: -"Do/did you hear voices when talking to other people? What is/was that like?"

PROMPTS

-"What is/was your relationship like with your voice(s)?"

-"What do you think it would be like to have talking therapy (like CBT)?"

-"If difficult: Is there anything that a therapist could do or say to make it easier?"

-"What would you want/have wanted out of therapy?"

-"What would it be like if these voices were less present in your life?"

vii) Additional information about the experience of voice hearing: "Is there anything else that is important to your experience of hearing voices that we haven't spoken about yet?".

PROMPTS

-"Do you have any advice for other people who hear these kinds of voices?"

-"Any advice for health care professionals?"

For the interviewer to check their understanding within the interview: "I might think about it like [*insert paraphrase*]… what do you think of that?" "How would you change that?". Or, "what I've heard from you is [*insert paraphrase*], is that right?"

If the interviewer thinks the participant might appreciate a break: "would you like to pause for a break here?"

To end: some people find it helpful to have a quick phone call after the session, just to see how they are feeling after sharing their experiences. Would you appreciate a call later today/tomorrow?

Analysis

A grounded theory methodology (Glaser & Strauss, 1967) was used since it is intended to generate a theory about a complex process about which little is already known. NVivo 12 (QSR International Pty Ltd, 2018) facilitated coding. Free coding was used with the first three transcripts in order to generate an initial coding framework. The framework focused on psychological variables (beliefs, emotion, and behavioural responses) alongside other pertinent descriptions of experience derived from the data (e.g. isolation, suicidal thoughts). A research diary was completed logging decisions in the theory generation, theoretical sampling, and analysis. This ensured transparency in the iterative process. A second clinical psychologist who specialises in psychosis research acted as a second rater for one interview, using the framework generated by BS to enhance the credibility of ratings. The coding framework and illustrative quotes were presented to a LEAP who relabelled some of the codes and

confirmed the appropriateness of the overall framework. This framework was subsequently applied to later interviews using the constant comparison method. New codes were added as they emerged, and all interviews were subsequently re-coded to enhance dependability. Finally, the results were discussed with the LEAP who confirmed the overall structure of the results, and either confirmed the appropriateness of each code, or adjusted the name after discussion with BS.

Results:

Fifteen participants were recruited. Table 1 presents the participants' demographic and clinical characteristics. The group was predominantly white British, unemployed, and lived alone or with parents. The data confirm that a diversity of perspectives were sought in terms of the initial recruitment criteria. Age ranged from 18 up to 56, duration of hearing voices ranged from 1 to 29 years, and both employed and unemployed participants were recruited. There were a range of abilities in dismissing or ignoring DTVs. Around half of the group had current difficulties dismissing or ignoring the DTVs that they heard. Six could dismiss or ignore DTVs at least some of the time. One participant was able to dismiss or ignore the DTVs all of the time, and one participant no longer heard voices, but reported previously finding them difficult to dismiss or ignore.

Table 1. Demographics and clinical characteristics (N=15)

Demographic or clinical characteristic		Frequency
Age		
	≤20	1
	21-30	3
	31-40	5
	41-50	5
	51-60	1
Ethnicity		
	White British	13
	Chinese	1
	Black British	1
Gender		
	Male	11
	Female	4
Marital status		
	Single	11
	Married/civil partnership	3
	Divorced	1
Employment status		
	Unemployed	10
	Employed (part-time)	2
	Other	3
Accommodation status		
	Lives alone	6
	Lives with parents	6

	Lives with partner / spouse	2
	Supported accommodation	1
Diagnosis		
	Schizophrenia	10
	Schizoaffective disorder	1
	Psychosis not otherwise specified (NOS)	4
Current voice hearing status		
	Current difficulty dismissing or ignoring DTVs	7
	Can dismiss or ignore DTVs at least some of the time	4
	Can dismiss or ignore majority of DTVs	2
	Can dismiss or ignore all DTVs	1
	Currently does not hear DTVs	1
Age of onset of voice hearing		
	≤15	4
	16-25	7
	26-35	2
	36-45	1
	46-55	1
Duration of voice hearing (years)		
	1-5 years	5
	6-10 years	0
	11-15 years	3
	16-20 years	4
	21-25 years	2
	26-30 years	1

Several participants shared that the question about voice content (*"Do you feel able to share what the voices say/said?"*) was difficult to answer, or paused to put thought into whether or not they should answer. Asking closed questions with broad content (e.g. *"do the voices threaten you?"*) was more tolerable. Table 2 presents an analysis of the sub-types of derogatory and threatening voice content shared by participants.

Table 2. Categories of DTVs with illustrative examples.

Term	Sub-type	Definition	Examples
Derogatory voices	Critical content	Voice(s) that make direct criticisms of the individual's self-concept.	"telling me things like I'm worthless and you know, you don't deserve to be here" (V10) "you are evil […] you are possessed" (V5)
	Negative perceptions from other people	Voice(s) which tell the person that they are viewed negatively by other people.	"Everybody else hates you and they don't need you and they think the worst of you. And um, just that you are you know just a complete disappointment" (V9) "I am this bitch and I am this ridiculous witch". (V4)

Threatening voices	Voice is the perpetrator	Threats made by the voice(s) that they intend harm to the person, or those around them.	"They have started swearing at me um, threatening to cut my hands off, threatening to er take me away and bury me in a field" (V15) "they were on about my neighbour that lives upstairs and [cough]. And they said they were going to hurt the kids and so, I ran up the stairs" (V13)
	Family, friends or other specific perpetrator	Voice(s) telling the person that they will be harmed by people already known to them. This may also include harm to people around them.	"they encouraged me to think that my mother and her husband and some of my friends were all, all kind of serial killers" (V1) "I am coming to get you,' is/was the main thing that they said" (V8, who heard the voice of a family friend)
	Unknown or no specific perpetrator	Voice(s) telling the person that they will be harmed, but no particular individual is identified, or the perpetrator is not someone known to them. This may also include harm to people around them.	"People are going to get me when I least expect it" (V6) "I was hearing everywhere I went people saying oh… um they are going to cut out his right eye and show it to his left eye, things like really brutal things" (V3).

N.B. Participants may endorse more than one sub-type of DTV

The impact of DTVs.

Participants described severe anxiety (e.g., *"It's a scary, scary, scary, scary situation, I've had more fear in the last two years [pause] than anywhere in my life"* V15), depression (e.g. *"when the torture starts [..]I will feel so depressed I'm just in bed"* V4) and anger (e.g. *"I haven't had any kind of aggressive outbursts in terms of towards anybody else in the real world, but I've most definitely been aggressive towards the things in my mind."* V1). Social isolation was a prominent theme (e.g. *"it's a pretty lonely place"* V15). Every participant described self-harm, suicidal ideation, or attempts, despite not being directly asked about it (e.g. *"the only thing I would do or felt I was able to do when I heard voices was to hurt myself and that's the only way I could get it to stop"* V10).

Reasons for listening to and believing DTVs

Six higher order categories were derived from the data. Within these higher order categories were 21 reasons for listening to and believing DTVs (see Table 3). Each participant endorsed between three and nine reasons.

1. Desire to understand the voices

V2: *"If it killed me it didn't matter, I just wanted to know what was happening".*

Participants described a range of questions (who, why, what, how, and where) which served as reasons for listening to distressing content.

1.1 Who is it? Where is it coming from?

Several participants described keeping DTVs in their attention to work out who the voice was, for example *"when I'm around people that's where I struggle with it feeling so real. I will look around, I will try and work out who is saying it, why they are saying it, I don't understand, what have I done?"* (V5). For V12 identifying the culprit was important to assess their ability to harm: *"Because I don't know who they are, what they represent, what they could do to me"*. Identifying the location of voices served as another reason for focusing on them: *"I just don't understand where it's coming from. It's frustrating"* (V15). V2 explained that if he can see where the sound is coming from it is easier to ignore: *"that's the difference you know if you sit here calling me a paedophile and a cunt and everything…. No, that's not just the difference, the difference is that I can see you saying it"*.

1.2 What is their motive?

Many participants described wanting to identify the intention of the voice or work out why particular threats or derogatory remarks were made. For V13 this was associated with arguing with the voices "*I just don't understand why they are doing it. I just can't understand, some of the things they say.., I argue with them every night."*.

1.3 What is happening?

Several participants were trying to understand why they were experiencing DTVs and did not have an adequate explanation, for example "…*didn't really know that much about um about hearing voices so, I sort of just believed it"* (V3). V6 read a psychology textbook to learn about his condition and explained "*it helped me not to believe in them so much".* V5 described how a friend shared a rationale for the DTVs which helped her question them on a bad day: "*I reckon she was on and off the end of the phone for a good couple of hours before I realised okay, maybe she is right, I'm really tired, I'm really low, I'm really agitated. This is probably because of the muck up with my meds… So, when she talked me down I started to be able to rationalise things"*. Explanations for DTVs that had been shared with participants by professionals were not always sufficient. V15 described: "*I mean why would my*

brain tell me that I'm a paedophile when I'm not?", V3 explained that his diagnosis was helpful for questioning the DTVs, but only after some time: *"I had been told by that psychologist that I had psychosis and even if I didn't believe her I still had that in my head so"*.

2. To be alert for the threat

2.1 To be prepared for what the voices might do

A few participants noted listening to threatening voices to be prepared for voices' threat, e.g. *"I've got to listen to this because I need to know what they are […] planning to do to me so I can be prepared",* (V15). This led to precautionary strategies and escape plans, for example, *"I make sure there's no weapons lying around that they can get at, but I certainly know where things are that I can pick up"* (V15) *and "my life was in jeopardy, so I acted on trying to find a safer place"* (V1).

2.2 To negotiate with the voices

Several participants described listening to reason with DTVs. This was pertinent for V1 who had tried persuasion *"kind of persuade them to be nicer"* and doing things to change the voices *"from [..] playing music to kind of preaching about [..] the awesomeness of existence"*. V5 tried using logic: *"I would be like 'that's ridiculous that's not even logical, like I know they are not in [London]..So, how do you propose that you are going to do that there?'".* V8 tried to please the voices *"I would like bargain with them, like if I do it more or if I do it better will you make sure something bad doesn't happen to me?"* but did not negotiate with the most threatening voice *"the main [voice] I don't think I ever bargained, I think I was so scared that I would just sit and, I don't think there was any point in bargaining".*

Several participants had not attempted to negotiate with the voices either because it had not crossed their mind, because they argued with the voices instead *"I'm not reason[ing] with them, I'm telling them to fuck off" (V4)* or because they didn't think they had the power *"I never thought that I had the power to stop er a chain reaction of voices anyway, so let alone put a stop to or change their mind" (V14*). One person tried, but did not continue, *"Yeah, I did but I really struggled with that. I think it was partly, um being you know talking to yourself [laughing]" (V2).*

Almost all participants noted how trying to change the voice's mind was not effective (*"17 years later I know I shouldn't have bothered"* (V1). However one participant noted that negotiating timings was

sometimes effective: *"if I'm out and about I will think in my head [..] 'come on, you just had a half hour an hour ago like I really need to get this done'"* (V5).

2.3 Because I'm fighting them

The majority of participants described confronting the DTVs. They did not explicitly state that they listened in order to engage in a fight, but this is implied in the descriptions, for example: *"I was just taking them on, I was like I'm not having this anymore…you are not going to rule over me all the time"* (V7). For some, a physical confrontation *"okay, let's go outside"* (V15), a mental argument *"I've definitely been aggressive to the things in my mind"* (V1), or more passive strategies *"I don't need to fight back… I can just annoy them with cigarettes and alcohol"* (V12) were described.

The key reasons for fighting the voices include *"their stupidity and… unreasonability"* (V1), status *"you're not going to rule over me"* (V7), how unjust it is *"do you know the film Shawshank Redemption, …it's about a man who was jailed for the, for a crime he didn't do. Um, somehow, I can relate to that"* (V4) and to get them to stop *"I just wish they would go away"* (V13). None of the participants described fighting the voices as a helpful approach. Instead, all were in agreement that *"it doesn't end well"* (V7). It either keeps the voices at the forefront of attention *"I am making myself a lot more aware of the noise"* (V9), makes the voice more aggressive *"It gets more, more vicious you know"* (V15), or makes the person act in a way that is incongruent with their sense of self *"you just feel like crap, because it ain't you"*.

2.4 Because it's my responsibility to stop them from harming others

A few participants described feeling responsible for stopping DTVs from harming others and this provided a rationale for engaging with them, for example, *"It's almost like they warned me, and I have gone yeah, whatever, that's not going to happen. If it did happen how would I cope with that? … you are never going to forgive yourself"* (V5).

2.5 Because I'm scared about the consequences

Several participants noted being scared of the consequences of not listening to the voices, or doing what they say *"Oh, they will screw me more."* (V4). For some there was a fear of voices getting worse: *"I found it difficult because you would be [..]scared of the reaction or scared of what else might be said."* (V9), or there being negative consequences after death (see Table 3, V12). One participant who did not listen to or believe his voices noted, *"[If] I dismiss something negative I'm not concerned that*

something negative will come out," (V11) and two participants noted learning that their fears do not occur: *"if I tolerate it and try and keep going there's less kind of retaliation from the noise and from the voices there."* (V9).

3. Because my instinct is to rely on my senses

3.1 Because they sound so real, why would you question it?

Several participants described initially accepting that the voices were real: "*I didn't realise it wasn't real and that… it was my illness, I didn't know I was ill, I thought that was the way it was"* (V7). V3 explained away why others were not hearing what he heard: "*I thought that I had like superior hearing to other people [..] because I was hearing these things that other people weren't".* V2 explained that the voices were *"as audible as you are now and that's all you need"* to start listening. For V5 perceiving the sound coming from an external source made it more difficult to question: "*because I hear it from outside like I would hear a normal conversation. And I think he [a friend who hears voices] can tune in and out of it may be easier than I can because it's all inside".* For V12 it was because the voices were accompanied by a sense of familiarity: "*They became more real to me and I couldn't brush it away.. they had the gravity…that hadn't been there before".* ***Int:*** *"why was that, that they had that gravity?"* ***V12:*** *"er déjà vu, I had the same conversations and the same experiences previously".* Whereas for others (V1, V13) it was the human qualities linked to the voice, for example, V1 described: "*I was believing because their behaviour is fitting within [pause] human kind of emotional response.".* For V15 it was the content and meaning of what was being said that seemed real and the rationale backing up the threats: "*the threats are so, so real"* Int: "*Real in what sense?"* V15: "*Well, they are threatening to kick my door in, they want to cut my hands off …They want to cut my [pause] 'member' off um because…I was with [Rachel] when I was um 20 or something, now she has killed herself and it's your fault".*

3.2 Other anomalous experiences support the voice

A few participants reported tactile hallucinations linked to their voice hearing. V4 described this as *"torture"* explaining: *"they have this electronic weapon that can be used on me, my head… it's indescribable but it's horrible".* This is directly linked to her listening to the DTVs *"you try to ignore him and that, that's not acceptable to him. And he beats you up to force you to hear".* Some participants described visual hallucinations at the time of hearing voices: V5: *"they were telling me that like a woman was coming with a gun, [..] she would find a way to shoot me… I laid on my bed like battling*

about it and then I looked up and like in the doorway…she was just stood there". A few participants described olfactory hallucinations which kept the DTVs in attentional focus. V5 described this as an early indicator of relapse: *"I know I'm getting ill because one of the first things is everything starts smelling chemical…like as I'm smelling things they will be telling me that people are going to poison me.".*

V8 experienced nightmares depicting the threats made by her DTV. Dreaming about being captured by the DTV made the voice's threats more compelling: "*Like, the dreams felt very real".* Several participants noted that acute fear from nightmares exacerbated voices. For V1 it triggered an acute episode of DTVs: *"…the second time it was basically coming from the back of a very nasty experience in a dream".* V14 explained that he is less active the day after experiencing nightmares which means there are fewer distractions from the DTVs (reason 6.4): *"[after a nightmare] it's like you have been through a few rounds with a boxer and you are like recovering and you are in recovery mode almost".*

3.3 Because I don't have enough evidence to dispute the voices

Several participants who had experienced DTVs for several years noted initially believing them: *"Well, it's been so long and the thing that I've been thinking you know …none of the things that I was thinking about have actually occurred…"* (V1). For V6 both habituation, *"I got used to it"*, and evidence gathering, *"nothing has happened"* enabled him to believe them less. Evidence helped resist voices demands: *"since I was what 13, 14 so sort of 20 years, they have told me things are going to happen and they never have… Whether I've done it or not the things have never happened."* (V5) and improving mood: *"it's been a couple of years now…nothing particularly bad has happened and I can [pause] find a lot more peace… So, I'm quite [pause] happier really, but they are still there"* (V12). Not all participants however noted a change over time: *"I don't think it has, just the same"* (V11).

As a means of optimising the utility of the evidence gathered over time V5 shared her experience of keeping a log and using it to question the voices: "*I go back to and I remind myself, I read it and I'm like all these things, all these things and not one of them has happened. So, why is this one going to happen?"* but this was not always effective when the voices were particularly severe: "*Um and no amount of me trying to give a reason why it's not real is making a blind spot of difference and no amount of my mates or my family trying to talk me down is making a blind spot of difference.".* For V14 this rationalising was not accessible to him at all: "*You can't just seem to switch off, you don't, you don't tend to have that, that mechanism that says, "hold on a minute [Dave], don't you think that's a bit bizarre? Somebody having a conversation with you, you have never met" or something like that,*

you don't have those rational thoughts, you don't, you don't have, that doesn't happen". V6 described building up the confidence to check out with friends whether he could trust his hearing "*I tell friends about it and they say I don't hear anything you know there's nothing there, it's just your imagination*".

3.4 Because other evidence supports that the voice and/or what it's saying is real

Many participants described evidence that supported the veracity of what the DTVs said, or that they are real entities. V1 found the voice content difficult to comprehend but considered "*the second world war. And you think well, those people were totally evil, they would be thinking the same kind of things in terms of murdering anything they didn't like".* He also felt victimised whilst playing a computer game and thought "*Maybe you are a victim in some kind of way…so that was kind of reinforcing the kind of thinking that it's all a reality in terms of having real people in my mind".* V5 described concrete evidence that people she knew were DTVs: "*if you were to say something at the same time and I saw your mouth moving as they said it I might think it was you. And it's happened, like with my mum it happens quite a lot".* Some participants described a confirmatory bias: *"Almost all the things I would see would have some significance and relate back to the [DTV]"* (V8).

4. Because I hear the voice of someone I know

A number of participants described hearing the voice of family members, friends, ex-friends, famous people, and other people they had met momentarily which made DTVs more difficult to question or ignore. For some, the voice content was congruent with what was known about the person *"they are doing exactly what they did when I fell out with them"* (V13) and for others it was incongruent *"technically you would think I should go 'well, I know them, they wouldn't say that'"* (V5). Four participants commented that hearing the voice of someone familiar was more difficult to ignore: *when it's family there's um probably about 100% um there's 100% on top"* (V14).

There was a range of reasons why these were more difficult to ignore, including: *"it's one of the voices that you trust more than anything"* (V14), because the voice content could reflect an already difficult relationship *"with in-laws… you don't know what they think about you"* (V2), because of prior experience of the person's intentions *"I think they are just trying to finish the job"* (V13), because the person is used to listening to that voice "*I hear them in the voice that I'm used to them using"* (V5), because hearing a famous person can lead you to "*get immersed in it like you are almost famous"* (V14), and simply because they exist *"this guy must be real, it must be the guy that I saw two months ago… because it's his voice I've been hearing"* (V3). One participant conversely found that if he heard

voices of people he recognised they were easier to dismiss than other voices *"the ones that are people I know they are the ones I can, I can sort of rationalise if you like: 'well this is ridiculous…there's no way I can hear your thoughts'."* (V7).

5. Because the DTVs use communication strategies that capture attention

5.1 Because the voices use calm, clever, or calculated tactics

Participants described a range of ways that the DTVs are *"calm and calculated in what they say"* (V10) and that this captured attention. This was central for V10 who described that DTVs were captivating because: 1) they were quieter and easier to listen to than angry ones because "*it's not as scary I suppose"* and 2) they intentionally say things to provoke intrigue "*because sometimes I don't understand it like and it makes me think about what they are saying…maybe that's why they are doing it".* Four other participants described finding that when voices are quiet or whisper, this encourages listening, for example: "*the quieter they get the more…I find myself trying to really listen to it"* (V5). But V5's reason for listening was different from V10's: *"I guess the louder they are the more clearly, I know what's being said…and can rationalise what's being said".* For V13 this whispering was an intentional tactic: *"because the sound, it makes you want to listen, the voices, the voices do it as well and it just makes you want to listen to them".* DTVs provoking intrigue was also described by others. They triggered forgotten memories *"the memories like, when they say things from the past and that, things you had forgotten like and you remember it. Sort of grabs your attention"* (V13), had unexpected knowledge *"it's things… you just think people shouldn't know about you"* (V3), and asked questions *"they're going 'oh, hasn't he worked it out yet?'… so I'm thinking, what haven't I worked out?"* (V15). For one person it was the intelligence of the DTV: *"you hear something intelligent back you tend to be more alert, your ears prick up a bit"* (V14).

5.2 Because the voices shout, scream, or make sinister noises

Several participants noted, *"their voices got louder, it wasn't that easy to ignore them."* (V4). For others, it was their manner as well as volume: *"A real sick, sick kind of manner"* (V1). For V9 a noise served as a means of the DTV capturing attention: *"when the voices have got your attention that's when the conversation can kind of start… like the derogatory and the violent comments"*. She noted that some noises she has habituated to over time, *"it's not as effective as it used to be, it's been going on for so long",* but this hasn't happened with other noises, for instance, *"I get like a sinister laugh which I still get like even to this day. That's probably the only thing now that would get my attention*

more because it's quite unnerving." and because this noise is uncomfortable *"I'm almost listening for it".*

5.3 Because they are constant or repetitive

Several participants noted listening to or believing voices because they are constant, or repeat what they say (e.g., *"And I think to myself why are you listening, it's not worth listening to. But obviously that's easier said than done if you[..]had constant noise and voices for like two, three, four, five days"* (V9)).

6. Because I'm worn down

6.1 Because I'm tired and don't have the energy to ignore them

All participants reported disturbed sleep or energy levels. Many participants reported sleep disruption leading to voices being more difficult to ignore. One participant explained *"Yeah, it's not so much the voices are any different to any other day it's my ability to rationalise them."* (V5) whereas another said that they have less control *"when I haven't slept that's, that's when I struggle to, to even like er, I struggle to like even make them stop."* (V10) and V13 described that sleep disruption led to the DTVs becoming louder: *"They would be a lot louder and I would hear them more"*.

The types of sleep disruption that caused the DTVs to be more believable and difficult to ignore included: 1. voices disrupting sleep *"suddenly they woke me up, they need to interrogate me"* (V4), nightmares linked to the voices "*give me a way that he was going to capture me in the dream*" (V8) and a purer insomnia presentation "*I was so sort of anxious and hardly sleeping really"* (V3). Problems with energy levels were also noted, with underlying causes reported to be the exhaustion of managing voices *"But doing this plus having ten other conversations you know…it's extremely tiring."* (V2), medication side-effects "*'Interviewer: what was the reason for stopping [the medication]?' V2: 'I was just knackered all the time,'"* or mood instability, "*so, the more manic I get the worse my voices get, because when I'm manic I don't need to sleep"* (V5).

6.2 Because I'm lacking self-confidence

Almost all participants described difficulties with self-confidence. A few noted that their own lack of physical strength meant that an attack from the voices would be more likely to succeed: "*I don't have the strength or physical ability to defend myself. [..] and it is kind of compounded the fear factor"* (V1).

Others noted that voices intentionally targeted them when they were vulnerable (V7, Table 3) and the content embellishes pre-existing concerns (reason 6.3) "*I'm feeling stupid or I'm feeling overweight or whatever and [..] that's what I will hear"* (V7). For others, confidence was required in order to test whether the DTVs were real, for example, V6 was asked what prompted him to ask friends *"did you just say that?"* and explained, "*Maybe I sort of got a bit more self-confident."* He also noted that this questioning relies on the "*confidence…to believe in um my mind a little bit maybe rather than the voices".* For V14, a low opinion of his own intelligence impacted his perception that he could dispute the DTVs "*[I'm] not intelligent enough to"* and his desire to seek psychological therapy "*if I ever started talking it wouldn't be anything constructive, or anything good, or anything valuable coming out of my mouth"*.

For some participants problems with self-confidence came before the onset of the voices, for example, V9 wondered whether her own lack of confidence may have contributed to the onset of voice hearing "*whether it stems from 'um [pause] just self-esteem being younger".* Whereas for others the voices triggered confidence problems "*I just didn't feel like the same person anymore"* (V13). V11 (who felt able to dismiss his voices) was the only person who described feeling self-assured *"I think inner strength has always been in me 'um from a young age".*

Some participants talked about confidence improving over time, *"I used to like to be really negative about myself and have quite a low self-esteem and stuff. But now I just think I've grown a lot in who I am, and I have kind of [pause] learnt that I quite like who I am."* (V5). But that this takes work *"you reap what you sow"* (V7) and examples from daily life were perceived by participants as important to build confidence. For example, V6 explained that *"socialising I would say helps…just I suppose working on my music and that kind of thing"* and this enabled him to *"I suppose I trust myself a little bit more to question things"*.

6.3 Because the voices are confirming or embellishing pre-existing concerns

Several participants described DTVs confirming, exaggerating, or embellishing pre-existing concerns. V9 explained, *"I would panic people would get in the house. And then obviously the voices would kick in and say someone is going to be in the house, someone is going to take this, people are going to do this…"*. For some participants, their primary problem appeared to be paranoia (V8: *"if the belief was less then [..], I wouldn't give the voices so much time"*). For others their low mood and associated negative thoughts made them more inclined to believe derogatory remarks: *"I mean I suffer from*

depression… you have always got that thing in the back of your mind that you are [..] no-good, a no-good character" (V14).

Some participants agreed that their pre-existing beliefs gave a reason to listen out for the voices: *"Sometimes I probably do yeah, which is probably even more perverted because I'm carrying on doing it. And I'm thinking about what people are thinking um about me, stuff like that. And wanting to, to engage in that"* (V14). Some imagined the voice content, which triggered DTVs. V3 (who experienced paranoia) explained *"that's how it sort of started…imagining in my head what people were saying and hearing that"*. V1 described using his own interpretations to fill in the gaps: *"it is just the odd word here and there. And you know you get the gist of what's being kind of thought or said".*

6.4 Because of isolation and lack of mental stimulation

Inactivity and lack of stimulation were common, e.g., *"not going outside at all for a month"* (V3) and provided time to listen to the voices: *"If I'm busy I haven't got time to think about it, I don't have time to listen"* (V9). Night-time was problematic because of the quiet and lack of distraction: *"it's so quiet and everything is still and you listen because you hear more. And it's almost like sometimes you lay there waiting to hear it"* (V9). For some participants, being busy was also an opportunity to gain information that disputes the derogatory and threatening voice content: *"it gives you another out, another perspective on a day rather than spending it cooped up in your flat thinking"* (V14). Activities that consumed one's attention were particularly helpful distractors, for example, V5 explained, *"driving and sports has always been, always been the things where I am consumed with that and not with them."*. She explained that the voices still "*babbled*" but she did not notice what they said, unlike other times. She shared an important reason for shifting her attention: "*with the driving, I think it is because I'm so aware that it could be really dangerous if I don't concentrate [on driving, instead of the voices]".* Other auditory activities were commonly described as helpful: *"I used to play guitar quite a lot in terms of a distraction, or kind of bit of, bit of a relief from the kind of the noise"* (V1). However, V1 described that an overreliance on this strategy resulted in him damaging his ears. V6, who was also interested in music, noticed that when he focused on music *"[the voices] pretty much completely go"* and V14 agreed "*You tend not to hear stuff when you are doing stuff, constructive".* Listening to other people speaking (rather than another auditory input per se) was deemed important by V8 who explained: *"Other people talking that you can listen to instead of the voice in your head, and don't just sit on your own with the voice"*.

6.5 Because I give up, I'm defeated by them

Participants frequently described managing the voices as an ongoing battle ("*every day I was trying to battle the thing I couldn't win",* V8). Given the persistent nature of the voices, however, nine participants described listening because they felt defeated by them. For some, this directly led to times of vulnerability for attacks from the voices: *"it's like Guerrilla warfare where [..], they are waiting until I'm down and out and vulnerable, weak, and then they will attack"* (V7) and feelings of suicidal ideation *"the worst thing is to feel that self-destructive sort of 'oh, I've got a solution for all this, I will just end it'"* (V7). Conversely, however, one participant described his ability to not listen to the voices as resulting from mental strength. When asked how he could ignore the voices, he explained: *"it's just from mental strength… having a strong mind, being sure of yourself"* (V11).

Table 3. Category structure of reasons for listening and believing DTVs

Core category	Higher order category	Reason for listening and believing DTVs	Illustrative quotes
Reasons for listening and believing DTVs	To understand the voices	Who is it? Where is it coming from?	"I think for me because I was always trying to work out who it was, so any trait in the voice or any, any slip up they made or anything like that I would be trying to figure it out." (V2). "When I am in situations when I'm around people that's where I struggle with it feeling so real. I will look around, I will try and work out who is saying it, why they are saying it, I don't understand, what have I done?" (V5).
		What is their motive?	"I became just really um transfixed with all these different voices like talking about me and I couldn't really understand why they were talking about me.". (V3).
		What is happening?	"There's only so much you can really um, I don't know there's only so much you can question, so much you can question it. Because at that point I had never used antipsychotic medication, didn't really know that much about um about hearing voices so, I sort of just believed it" (V3). "Um, and yeah you sort of, you do question it and think well, why would that happen to me of all people?" (V9).
	To be alert for the threat	To be prepared for what the voices might do.	"I didn't want to hear the voices [but] I did at the same time because I thought I could get something out of it about where he was going to be and I could not be there" (V8). "I have to listen to this because I need to know what they are going to, planning to do to me so I can be prepared".
		I listen to negotiate with the voices.	"I thought that they were similar to me and they were just like human beings that could kind of be persuaded round to a more pleasant way of being" (V1). "I would like bargain with them, like if I do it more or if I do it better will you make sure something bad doesn't happen to me?" (V8).
		And I listen so I can fight the voices.	"I just thought like fight or flight I just thought I am going to fight these voices, I am not going to allow them to win" (V7). V10: "Telling them to fuck off" Interviewer: "what happened to the voices when you tried to say that?" V10: "Getting worse, they were arguing with me.".
		I listen to stop the voices from harming other people.	"It's almost like they warned me, and I have gone yeah, whatever, that's not going to happen. If it did happen how would I cope with that? … you are never going to forgive yourself" (V5). "And they said they were going to hurt the kids and so, I ran up the stairs about five times, knocked on her door to make sure she was all right." (V13).

		I listen because I'm scared about the consequences.	"I especially worry about the supernatural. You do listen because you never know quite what they could do." (V12). "I found it difficult because you would be kind of scared of the reaction or scared of what else might be said or what else you might be told to do um." (V9).
	Because my instinct is to rely on my senses	Because they sound so real, why would you question it?	"They were convincing because they were as audible as you are now and that's all you need" (V2). "I didn't realise that it wasn't, I didn't realise it wasn't real and that it didn't, you know it was my illness, I didn't know I was ill, I thought that was the way it was" (V7).
		And other anomalous experiences support the voice.	"Just because I feel they, I feel just pain in my, in my stomach area. With, so like what they are saying registers whether I like it or not." (V12). "It's like they have this electronic weapon that can be used on me, my head, it goes it's indescribable but it's horrible. Sometimes I just feel like my head was, it can be so bad that it hurts so much". (V4).
		And I don't have enough evidence to dispute the voices yet.	Interviewer: "do you have any sense of… why it is that they seemed more believable before?" V6: "just time again I think…Sort of got used to it, nothing has happened". "I just thought I, I didn't know, I accepted that they are real things and they exist in another plain" (V12).
		And other evidence supports that the voice or what it's saying is real.	"And so the fact that kind of the things I would hear like would match up to something I would see which would then match up to like my belief… when you are trying to make sense of something you see these little connections everywhere" (V8). "Almost all the things I would see would have some significance and relate back to the [the persecutory voice]". (V2).
	Because I hear the voice of people I know		I almost hear it in the voice that I'm used to them using, I think, I think I find it harder to rationalise than say if it was a stranger in a cafe because I don't know their voice from Adam" (V5). "When it's family there's um probably about 100% um there's 100% on top". (V14).
	Because the DTVs use strategies to capture my attention	They use calm, clever or calculated tactics to get my attention.	"It draws you in, it draws you in, they say things that make you want to listen… you don't want to listen to them, but you don't feel like you have a choice" (V13). "they try and be a bit sly and clever about it and it completely, it completely like doesn't upset me but it's like I have to think about it. Like, sometimes they disappear and I'm still, still thinking about it if that makes sense.". (V10).
		They shout, scream, or make sinister noises to get my attention.	"the real shrill screaming, because obviously, that's going to get anyone's attention, a real shrill scream that sounds like someone is stood right in your face" (V9). "their voices got louder, it wasn't that easy to ignore them.". (V4).
		Because they are constant or	"And I think to myself why are you listening, it's not worth listening to. But obviously that's easier said than

		repetitive so I have to listen.	done if you…had constant noise and voices for like two, three, four, five days" (V9). "When something is…shoved down your throat all the time it's just…I'm pretty sure…you could beat any of the strongest people down by you know making them solitary and then keep telling them something until they believed it." (V2).
	Because I'm worn down	Because I'm tired and don't have the energy to ignore them.	"When I am tired…I can't use the normal part of my brain [laughing] to go is this the illness or is this real?" (V5) "It's like you have been through a few rounds with a boxer [after a nightmare] and you are like recovering and you are in recovery mode almost" (V14).
		Because I'm lacking the confidence to dismiss them.	"I don't know sometimes if I am in a strong place and I, they don't affect me as badly as other times. But then if I'm down and out and I am feeling particularly weak and vulnerable it's like that's when they will attack." (V7). "confidence to um, to believe in um my mind a little bit maybe rather than the voices" (V6).
		Because they are confirming or embellishing my pre-existing concerns.	"the worries … are fuel for the voices to then add in. And like chip in their part to kind of make it worse or um turn it into something even more ridiculous" (V9). if the belief was less then I would, I wouldn't give the voices so much time or anything" (V8).
		Because I'm isolated and lack other distractors.	"If I am busy I haven't got time to think about it, I don't have time to listen" (V9). "it becomes monotonous. Your brain is going to look for something of interest at some point, it's going to start inventing things because you get up, you watch TV, you go to the toilet, you watch TV, you go to bed you don't do anything. Do that for five years you will lose your mind" (V15).
		I listen because I feel defeated by them.	"every day I was trying to battle the thing I couldn't win" (V8). "It's like Guerrilla warfare where they are like you know, they are waiting until I am down and out and vulnerable, weak, and then they will attack and then go again" (V7).

DTVs = derogatory and threatening voices

Discussion

This study identified 21 reasons for listening to and believing DTVs from patient interviews. Reasons were diverse and included aspects related to the self (e.g. emotional state, self-confidence), to the voice itself (e.g. its identity and the acoustic experience) as well as an overall drive to understand the experience. Whilst some reasons have been previously identified as important aspects of the voice hearing experience, for example, voice identity (Chadwick & Birchwood, 1994), acoustic properties (McCarthy-Jones et al., 2014; Moritz & Larøi, 2008; Nayani & David, 1996a) and aspects of the self

(Thomas, Farhall, & Shawyer, 2015), other factors, for example, a drive to understand the voice, and the specific threat appraisals were novel.

Patients described that listening to derogatory and threatening voice content led to them feeling depressed and anxious. In addition, all participants discussed self-harm or suicidal ideation despite not being asked directly about this. This underscores the importance of developing clinical interventions that enable the patient to distance their attention from and challenge such detrimental voice content. However, to shift attention away from the content, clinicians will need to consider the sorts of reasons for listening to DTVs identified in this study. The range of reasons includes modifiable cognitions that can be addressed through CBT interventions. For example, the appraisal "I listen to stop the voices harming other people" can readily be addressed via behavioural experiments which test the impact of listening versus distancing responses on the feared outcome. However other themes (e.g., to understand the voice) may require alternative approaches or further treatment development work. Irrespective, the therapist sharing a list of reasons why these voices can be so believable and difficult to ignore can guide a therapist in working with the patient to build up a more thorough, detailed and efficient formulation of the problem of listening to and believing DTVs.

This study also highlighted more distal psychological variables that might contribute to listening to and believing DTVs. Increased social isolation was described as a time when voices were more likely to be listened to, and conversely, connecting with other people offered both distance from the voices, and an opportunity to gain alternative perspectives that dispute the negative voice content. However, many voice hearers also described challenges connecting with others whilst hearing DTVs. A related problem that was commonly described was a lack of mental stimulation (a construct closely linked with boredom) and this provided time to listen to the voices. This was likely affected in part by high rates of unemployment in the participant group, which is representative of people experiencing psychotic symptoms (Evensen et al., 2016), as well as voices disrupting engagement in daily activities. Low self-confidence and an associated lack of trust in one's own mind were also described as influencing whether or not voices were believed. A previous observational study has shown that low self-confidence is a problem for half of patients who hear voices, and 71% want help to feel more self-confident (Freeman et al., 2019). Associations have been reported between negative self-beliefs and negative voice content (van den Berg et al., 2022; Waite et al., 2019), but the direction of the causal pathway has not been investigated. It is plausible that negative self-beliefs contribute both to derogatory threatening voice content and greater listening to and believing DTVs, but also that

listening to and believing DTVs decreases self-confidence. This is worthy of further investigation. Lastly, many patients reported that sleep disruption and the associated lack of energy was a time of vulnerability for listening to and believing DTVs. Insomnia occurs in two-thirds of voice hearers (Freeman et al., 2019) and plays a causal role in the occurrence of hallucinatory experiences in general (Freeman et al., 2017a; Reeve, Emsley, et al., 2018). However, it has not been investigated in relation to the degree of listening to or believing voices. The association between boredom, self-confidence, sleep disruption, social connection, and listening to and believing DTVs is an interesting avenue for future research and is investigated in Chapter Five.

There are limitations to the current study. The most severe DTV presentations are not represented in the participant group because several acutely unwell patients approached in this study said they were unable to talk about their experiences with the researcher. It would be expected that acutely unwell patients would experience higher levels of listening to and believing DTVs. It is possible that this group might identify additional reasons for listening to and believing DTVs that are not elicited through retrospective descriptions of such episodes. Equally, it is possible that fewer reasons for listening to and believing DTVs would be identified from those who are acutely unwell because they are so consumed by the voices that engagement in the interview is lower. Both of these possibilities would prove informative for the later development of psychological therapy to reduce listening to and believing DTVs. Lastly, people not in touch with clinical services and those experiencing DTVs in diagnoses other than non-affective psychoses may offer alternative perspectives.

The problem of DTVs that were both believable and difficult to ignore resonated with patients, and reasons for listening to and believing DTVs were readily identified in interviews. The study is a first step in developing a theory about reasons for listening to and believing DTVs. The clear next step is to develop assessment measures to assess key concepts in this approach. This will allow further refinement and quantitative testing of the theory. This is the focus of the next chapter.

3

Listening to and believing DTVs: measure development and a quantitative test of the theory

Abstract:

Rationale: Chapter Two identified 21 understandable reasons that patients listen to and believe DTVs. This chapter develops measures of listening to and believing DTVs, and the reasons for doing so, and tests associations with distress. **Method:** 591 National Health Services patients hearing DTVs completed this cross-sectional observational study. Listening and Believing–Assessment and Listening and Believing–Reasons item pools were completed, and assessments of distress. Exploratory and confirmatory factor analyses and structural equation modelling (SEM) were conducted. **Results:** 52% (n=307) of participants believed their voices most or all the time. Listening to and believing DTVs had four factors: active listening, passive listening, believing, and disregarding. Higher levels of believing, active listening and particularly passive listening were associated with higher levels of anxiety, depression, and voice distress. Reasons for listening to and believing DTVs formed seven factors: to better understand the threat; being too worn down to resist; to learn something insightful; being alone with time to listen; voices trying to capture attention; voices sounding like real people; and voices sounding like known people. Each type of reason was associated with active listening, passive listening, and believing. SEM showed that feeling worn down in particular accounted for variance in listening and believing. Test-retest reliability of measures was excellent (assessment measure intraclass correlation coefficient (ICC)=0.87; reasons measure ICC=0.90). **Conclusion:** A framework of listening to and believing negative voices has the potential to inform the understanding and treatment of voice distress.

This chapter is adapted from the journal article attached in Appendix Ib: Sheaves B, Johns L, Low, B., Bold, E., Černis, E, The McPin Hearing Voices Lived Experience Advisory Panel, Molodynski, A., Freeman D. (2022) Listening to and believing derogatory and threatening voices. Schizophrenia Bulletin, 49(1): 151-160. doi: 10.1093/schbul/sbac101.

Introduction:

Chapter One illustrated that the appraisal account of voice distress (Chadwick et al., 2000; Chadwick & Birchwood, 1994) has been central in understanding and treating the distress of people who hear voices. Meta-analysis indicates that appraisals concerning malevolence and omnipotence (Chadwick & Birchwood, 1994) have substantial associations with voice related distress (Tsang et al., 2021). This understanding has largely formed the basis for cognitive behavioural techniques for helping patients hearing voices (Birchwood et al., 2014; Craig et al., 2018a). Cross-sectional data show that power and malevolence each explain approximately a fifth of the variance in distress in voice hearers (Chadwick et al., 2000; Tsang et al., 2021). Variance is therefore left unexplained. The overall aim of the thesis is to extend the appraisal account of voice distress for a sub-type of voices: DTVs. The theoretical perspective is that if a person listens to and believes what DTVs say - and there are understandable reasons why an individual would do that - then that will increase distress. This Chapter provides the first quantitative test of this theory.

Chapter Two built a grounded theory of the reasons for listening to and believing DTVs, based on lived experience accounts. Twenty-one reasons (appraisals) for listening to and believing DTVs were identified, which were grouped into six higher order categories: to understand the voices; to be alert to the threat; a normal instinct to rely on sensory information; the voices can be of people known to the hearer; the DTVs use strategies to capture attention; and patients feel so worn down that it is hard to resist the voice experience. The first step in testing the hypothesis that these appraisals lead to greater listening to and believing DTVs is to ensure that key constructs in the approach can be assessed via psychometrically robust measures.

On 14th March 2022 Embase, PsycInfo and Medline databases were searched with no date restrictions for papers including the terms “questionnaire” OR “scale” AND “hallucination*” in the abstract, but NOT including “dementia”, “Alzheimer*”, “Parkinson*”, “cancer”, “narcolepsy”, “ketamine”, “drug” and “transcranial direct current stimulation” in the abstract. Inclusion criteria were: a psychometric evaluation of a scale for voices; and an English version of the scale was validated. Exclusion criteria were: book chapters; conference abstracts; reviews; case reports; and scales that assess voices in the context of drug induced psychosis, dementias, delirium, or learning disability. Reference lists and studies reporting translations of scales were also reviewed to identify any additional measures which were not detected by the search. The search returned 3,953 citations. After removal of duplicates this reduced to 2,187 references. Six additional citations were found through reference lists and translations. Titles and abstracts were reviewed for the inclusion and exclusion criteria which resulted in ten separate outcome measures for voices which were tested in 17 papers.

Figure 1. Methods for the systematic search of voice outcome measures.

A systematic literature search (see figure 1 for methods) revealed that there are no existing voice outcome measures that assess listening to and believing voices, or the reasons for doing so. Of the ten separate outcome measures detected in the search (see Table 1) three assessed the overall severity of voices (e.g. frequency, distress, and disruption to life) (Bartels-Velthuis et al., 2012; Haddock et al., 1999; van Lieshout & Goldberg, 2007), four measures assessed the appraisals of voices intent and power, the degree of control over voices and meta-cognitive beliefs (Birchwood et al., 2000; Chadwick et al., 2000; Chadwick & Birchwood, 1995; Morrison et al., 2002), two measures assessed the interpersonal relating styles with voices (Hayward et al., 2008a, 2020) and one measured acceptance-based approaches to psychotic symptoms (Shawyer et al., 2007). A first step is therefore developing validated scales for listening to and believing DTVs, and the reasons for doing so.

This chapter aimed to:

i) Develop an assessment scale for the degree of listening to and believing DTVs;
ii) Develop an assessment scale for the reasons (appraisals) people listen to and believe DTVs;
iii) Develop a full appraisals measure, a short form version, and a very brief (5-item) version that can be used for different clinical and research purposes;
iv) Test the hypothesis that listening to and believing DTVs predicts distress (anxiety, depression, and voice distress);
v) Test the hypothesis that the *reasons* for listening to and believing DTVs are associated with the *degree* of listening to and believing DTVs; and
vi) Identify the most important appraisals which predict listening to and believing DTVs.

Table 1. An overview of current voice outcome measures.

Questionnaire	Citation	Participants recruited in validation study	Voice attribute assessed	Scale description	Internal consistency
Approve - voices	Hayward et al., (2020).	A transdiagnostic group of adult patients with voices (N=402).	Relating to voices (assertive, aggressive and submissive interpersonal relating styles).	A 15-item measure. Items are rated on a scale from 0 (disagree completely) to 10 (agree completely).	Sub-scale α range =0.83-0.86.
The auditory vocal hallucination	Bartels-Velthuis et al., (2012).	A transdiagnostic group of adult patients with voices (N=62) and non-	The severity of voices.	16-item structured interview. Items	α=0.84.

rating scale questionnaire		clinical children with voices (N=347).		are scored on a 5-point scale.	
	Steenhuis et al., (2019).	Patients experiencing voices (sample 1 n=32, sample 2 n=82).			α=0.87.
Beliefs about voices questionnaire	Chadwick & Birchwood (1995).	Chronic voice hearers (N=60).	Beliefs about voices and emotional and behavioural reactions to them.	A 30-item scale assessing voice benevolence, malevolence, engagement, resistance and omnipotence. Each item is rated true or false.	Sub-scale α range =0.82-0.87.
Beliefs about voices questionnaire – revised	Chadwick et al. (2000).	Participants with chronic auditory hallucinations (N=71).	Beliefs about voices, and emotional and behavioural reactions to them.	A 35-item measure. Three belief subscales: omnipotence, malevolence and benevolence. A resistance sub-scale and an engagement sub-scale. Responses are rated on a 4-point Scale from disagree (0) to agree strongly (3).	Sub-scale α range =0.74-0.88.
	Strauss et al., (2018).	An international sample of clinical and non-clinical participants who hear voices (N=450).		Alternative factor structure: i) persecutory beliefs (combining omnipotence and malevolence); ii) benevolence; iii) emotional and behavioural modes of responding.	Persecutory sub-scale α=88. Benevolence sub-scale α=87.
Hamilton programme for schizophrenia voices questionnaire	Van Lieshout et al., (2007).	Individuals with schizophrenia spectrum disorders (N=20).	The severity of voices (character of voices, content, and impact).	Nine-item measure with 5-point Likert scale response options. Four additional items assess qualitative aspects of voices.	α=0.74.
	Kim et al., (2010).	Patients with a diagnosis of schizophrenia (N=87).			α=0.83.
The interpretation of voices inventory	Morrison et al., (2002).	Non-clinical participants (N=132).	Meta-cognitive beliefs about voices: positive beliefs, negative metaphysical	A 26-item scale. Responses are rated on a 4-point scale from not at all (1) to very much (4).	Sub-scale α range = 0.80-0.94.
	Morrison et al. (2004).	Patients with schizophrenia			NR.

		spectrum disorder and current auditory hallucinations (N=41). Non-clinical controls (N=39).	beliefs, and loss of control beliefs.		
Psychotic symptoms rating scale for auditory hallucination	Haddock et al., (1999).	Patients with schizophrenia spectrum disorders (n=46 voice hearers).	The severity of voices.	An 11-item scale with five ordinal response options.	NR.
	Woodward et al., (2014).	Individuals experiencing voices (N=711).			Sub-scale ICC range =0.67-0.93.
	Steel et al., (2007).	Individuals who had recently relapsed with positive symptoms of psychosis (N=276).			NR.
The voices acceptance and action scale	Shawyer et al., (2007).	Participants experiencing command hallucinations (N=43).	Acceptance-based attitudes and actions concerning auditory and command hallucinations.	A 31-item self-report questionnaire. Responses are rated on a 5-point scale from strongly disagree to strongly agree.	Sub-scale α range = 0.76-0.85. Full scale α=0.90.
Voice and you	Hayward et al., (2008).	A transdiagnostic group of patients experiencing voices (N=30).	Inter-relating between the voice hearer and their dominant voice.	28 items make up four subscales: voice dominance, voice intrusiveness, hearer distance, and hearer dependence. Each item is rated on a 4-point scale (0-3).	Sub-scale α range = 0.78-0.92.
Voice power differential scale	Birchwood et al., (2000).	Patients who hear voices with a schizophrenia spectrum diagnosis (N=59).	Power in relation to voices.	Seven power-related constructs are assessed on a five-point scale.	α=0.85.
The Yale Control Over Perceptual Experiences (COPE) Scales	Mourgues et al., (2022).	People who hear voices at least once per month (N=318).	Voluntary control over voices.	A two-factor scale: methods of control (8 items) and degree of control (8 items). Items use a 7-point Likert scale ranging from Never (1) to Always (7).	Methods of Control Scale, ω = .87. Degree of Control Scale, ω = .95.

NR=Not reported.

Methods:

Design

This cross-sectional observational study was conducted in 38 NHS mental health trusts between 18th February 2020 and 3rd December 2021. NHS Trusts covered all the geographical regions of England. Two separate participant groups were recruited to conduct exploratory (Part A) and confirmatory (Part B) factor analyses. To assess test-retest reliability, a sub-group of Part B participants completed measures one week after their initial assessment. Informed consent was obtained from all participants. The study was approved by South Central Oxford-B NHS Research Ethics Committee (19/SC/0610).

Participants

Participants were identified and recruited by the NIHR clinical research network. Participants were identified by clinicians who referred patients to the NIHR research teams, or via patients previously providing consent to be contacted for research. Participant inclusion criteria were:

1. Self-report endorsement of hearing voices at least once per week;
2. Endorsing derogatory and threatening voice content. Participants were asked, "do the nasty voices say any of the following things to you?" Responses options were: yes/no. Participants had to answer "yes" to at least one of the following:
    a. They tell me they are going to *harm me*;
    b. They tell me they are going to *harm people I know*;
    c. They tell me that *other people* are going to *harm me*;
    d. They *criticise me*, or the way I do things;
    e. They tell me other people are judging me negatively.
3. Being aged 16 or older;
4. An ability to understand English well enough to complete the questionnaires without the use of a translator; and
5. Being under the care of mental health services.

There were no exclusion criteria for the study. 308 participants took part in Part A, 283 in Part B, and 41 completed the test-retest assessment. Participants completed informed consent and the assessment measures either on paper, via an online survey (JISC; https://www.onlinesurveys.ac.uk/), or by reading out answers over the phone to the researcher while viewing a paper copy of the questionnaires.

Assessment measures

Experiences of voice hearing

Participants were asked about the age of onset of their DTVs. Three questions from the PSYRATS auditory hallucinations scale (Haddock et al., 1999) were delivered in a self-report format and assessed voice frequency, duration, and degree of distress caused. Derogatory and threatening content was assessed via endorsement (yes/no) of the five definitions outlined in the inclusion criteria (see inclusion criteria 2a to 2e). The types of criticisms made by voices were assessed by adapting negative self-belief items in the Brief Core Schema scale (Fowler et al., 2006) (E.g. "I am unloved" became "over the past week has the nasty voice told you that you are unloved?"). The five-point response options were rephrased to: 0 = no, 1 = rarely, 2 = 1-2 days, 3 = several days and 4 = at least once per day.

Listening and believing questionnaire–assessment (LB-A)

Individual items for this self-report questionnaire were generated from: 1. Qualitative interviews with people experiencing DTVs (Sheaves et al., 2020); 2. The McPin Hearing Voices LEAP; and 3. Clinical psychologists with expertise in treating psychosis.

Two theoretical factors informed the generation of items: i) listening to DTVs and ii) believing DTVs. Reverse items were also included for both factors. Items for the listening factor covered both voluntary control (e.g*., "I want to keep listening to what the nasty voices have to say")* and involuntary control of auditory attention (e.g. *There's nothing I can do but listen to what the nasty voices say"*). Items covered the period prior to voices starting (e.g., *"I listen out for the nasty voices"),* the point of onset of voices starting (e.g. *"When the nasty voices start it's almost impossible to ignore what they say*"), and during the voice hearing experience itself (e.g., "*It's difficult to focus on anything other than what the nasty voices say*"). The believing and disregarding subscales were generated to ensure that the amount of derogatory and threatening voice content a participant experiences does not affect the scoring, hence references to specific voice content were not included. Respondents were instructed to complete the questionnaire based on DTVs (termed "nasty voices") only, not positive or neutral voices.

Response options ranged from 0 (never) to 3 (all the time) and the past week was the time frame of reference. Lived experience consultants determined that one week was enough time to capture enough day-to-day fluctuation in voice hearing, whilst remaining a memorable period of time to form

a rating. Each item was assessed for comprehensibility by the LEAP and clinical psychologists and potentially confusing items were deleted. This resulted in the Part A participants completing an initial item pool of 46 questions (Appendix A). Part A data was analysed and subsequently Part B participants completed the shortened version (18 items).

Listening and believing questionnaire–reasons (LB-R)

Items for this self-report questionnaire were created from the qualitative study reported in Chapter Two. The scale covered the six themes identified in that study. Additional items were generated from the LEAP and psychosis specialist clinical psychologists. Each item was assessed for comprehensibility by the LEAP and clinical psychologists and potentially confusing items deleted. This resulted in Part A participants completing an initial item pool of 74 questions (Appendix B). Part A data were analysed, and Part B participants subsequently completed a shortened version (41 items).

Patient Health Questionnaire-9 (PHQ-9) (Kroenke et al., 2001)

The PHQ-9 is a self-administered nine-item screening tool for depression. It is commonly used within clinical practice and is the most psychometrically evaluated screening tool for depression (El-Den et al., 2018). Response options range from not at all (0) to nearly every day (3). The scale has a one-factor solution, hence items are summed to create a total score (El-Den et al., 2018). Higher scores indicate greater severity. Internal consistency is excellent in primary care patients (Cronbach's α=0.89). As PHQ-9 scores increase, functional status decreases, confirming construct validity (Kroenke et al., 2001). A score of 10 has a sensitivity of 88% and a specificity of 88% for diagnosing major depression when compared to a diagnostic interview (Kroenke et al., 2001).

Generalised Anxiety Disorder Questionnaire-7 (GAD-7) (Spitzer et al., 2006)

The GAD-7 is a self-administered seven-item questionnaire assessing generalised anxiety disorder (GAD) symptoms. Response options range from not at all (0) to nearly every day (3). Higher scores indicate higher levels of anxiety. The internal consistency of the scale is excellent (Cronbach's α=0.92) and a score of 10 or greater has 89% sensitivity and 82% specificity for diagnosing GAD when compared to a diagnostic interview (Spitzer et al., 2006). A higher score predicts worsening functional status, in support of construct validity (Spitzer et al., 2006). Whilst depression and anxiety commonly co-occur, factor analysis has confirmed that PHQ-8 (PHQ-9 scale with suicidal ideation question omitted) and GAD-7 items form distinct dimensions (Spitzer et al., 2006).

Analysis

Participants with greater than 10% missing data on the listening to and believing nasty voices questionnaires were removed from the dataset. Person-mean imputation was used to prorate missing values for the remaining participants on all questionnaires to maximise the use of the available data. Analyses were conducted in R version-4.0.5 (R Core Team, 2021) with packages lavaan (Rosseel, 2012), psych (Revelle, 2020), lm.beta (Behrendt, 2014), and regsem (Jacobucci et al., 2021). Factor

analyses used oblimin rotation. Reduction of item pools was based on: factor loadings (<0.50 for assessment; <0.30 for reasons); cross-loading item (>0.30); item communality (<0.30); clarity of item phrasing; and creating theoretically coherent subscales. Model fit was assessed by: 'reasonably good'=SRMR close to or below 0.08; RMSEA close to or below 0.06; CFI and TLI close to or greater than 0.95 (Hu & Bentler, 1999); and 'acceptable'=CFI and TLI 0.90-0.95 (Bentler, 1990); and RMSEA<0.08 (M. W. Brown & Cudeck, 1993).

To assess the factor structure of LB-A items, exploratory factor analysis (EFA) was conducted on Part A data using maximum likelihood estimation on the polychoric correlation matrix. Confirmatory factor analysis (CFA) was conducted on Part B data using diagonally weighted least square estimation owing to the ordinal data (Li, 2016). A bifactor model with a general factor was carried out to assess the appropriateness of calculating a total score. Test-retest reliability was assessed using the ICC. Simple regressions between the scale factors and distress variables were conducted using Part B data. The simple regressions with distress were additionally run whilst controlling for voice frequency, and the four most prevalent diagnostic groups (schizophrenia, psychosis not otherwise specified (NOS), BPD, and depressive episode/disorder).

The individual reasons for listening to and believing DTVs (LB-R items) are not of theoretical or clinical interest in and of themselves, only if they predict the degree of listening to and believing DTVs. Hence, the reasons item pool was initially reduced using regularised SEM (regSEM) (Jacobucci et al., 2019) on Part A data to ensure each item predicted at least one of the listening to and believing subscales. Active listening, passive listening, and believing nasty voices were regressed onto the 74-item pool and only items with a regression coefficient ≥0.01 across at least one of the dependent variables were retained. regSEM lasso is specifically designed to allow for the assessment of a complex model with a large number of parameters but with a limited number of observations (Jacobucci et al., 2019). A series of arbitrary penalty values are applied to regression paths to artificially drive the coefficient down toward zero. The purpose is to simplify the measurement model and only retain important predictors via an exploratory search. Significant items are not assessed based on *p* values owing to power issues with a large number of predictors, but instead based on their non-zero coefficients. The approach introduces a systematic bias at the expense of improved precision of the parameter estimates. A range of penalty values was tested to determine the best-fitting model by means of the Bayesian Information Criterion (BIC) (Jacobucci et al., 2019). Retained items from the regSEM analysis were factor analysed using minimum residual estimation on the polychoric correlation matrix, and the item pool was further reduced. A CFA model with a higher

order factor (combining all latent variables) was carried out in order to assess the appropriateness of calculating a total score.

Sample B data were analysed using CFA and robust maximum likelihood estimation (MLR) to create a full version of the scale. Further items were removed through CFA by assessing modification indices, factor loadings, and item content overlap. A shorter 16-item version of the reasons questionnaire was developed by regressing the higher order factor for the degree of listening to and believing nasty voices questionnaire onto the reasons item pool using regSEM. This reduced the item pool, following which CFA was carried out using MLR. The internal consistency was tested using Cronbach's alpha (α) and the correlation with the full version of the scale was assessed.

The same regSEM lasso method was used to create a 5-item version of the measure. The five items chosen had the highest coefficients across different latent variables. The internal consistency was tested (α) and the correlation with the full version of the scale was assessed.

The LB-A factors were regressed individually onto each of the latent factors obtained from the reasons questionnaire. *P* values were corrected for multiple comparisons using the Holm method (Holm, 1979).

To identify the most important reasons for listening to and believing nasty voices, accounting for shared variance, two SEMs were carried out using Part A and B datasets combined (N=576). LB-A factors were together regressed onto the latent LB-R factors (Understand, Worn down, Learn, Attention, Real people, Alone, I know). Given that a high degree of shared variance was expected between disregarding DTVs and listening and believing, a separate model was run regressing disregarding DTVs onto the LB-R factors.

Results:

Basic characteristics:

Sociodemographic and clinical information are presented in Table 2. The majority of participants were white British, though individuals from a range of other ethnic groups also took part. The ethnicity of the participant group was broadly representative of the population of England and Wales (Statistics, 2018). Most participants were single, two-thirds were unemployed, and the mean age was 41. Over half lived alone or with their parents. Voice onset tended to be when participants were in

their early 20s, two-thirds were under the care of an adult mental health team and two-thirds of the participant group had a diagnosis of schizophrenia or psychosis NOS.

Table 2. Sociodemographic and clinical characteristics

Variable		Part A (N=308)	Part B (N=283)
		Data are n (%) unless otherwise stated	
Age		M = 40.66 (SD = 13.11)	M = 40.95 (SD = 13.72)
Gender	Male	169 (55.23)	162 (57.24)
	Female	134 (43.79)	118 (41.70)
	Other	3 (0.98)	3 (1.06)
Ethnicity			
	Asian or Asian British	26 (8.64)	8 (2.88)
	Black, Black British, Caribbean or African	24 (7.97)	16 (5.78)
	Mixed or multiple ethnic groups	14 (4.65)	4 (1.44)
	White	228 (75.75)	232 (83.76)
	Other ethnic group	9 (2.99)	17 (6.13)
Marital status			
	Single	217 (70.46)	205 (72.44)
	Married / Civil partnership	38 (12.34)	32 (11.31)
	Cohabiting	24 (7.79)	18 (6.36)
	Divorced	22 (7.14)	25 (8.83)
	Widowed	7 (2.27)	3 (1.06)
Employment status			
	Unemployed	210 (68.18)	190 (67.38)
	Employed (part-time)	23 (7.47)	17 (6.03)
	Employed (full-time)	21 (6.81)	20 (7.09)
	Voluntary work	17 (5.52)	13 (4.61)
	Retired	11 (3.57)	15 (5.32)
	Student	11 (3.57)	14 (4.96)
	Self-employed	9 (2.92)	7 (2.48)
	House wife/husband	6 (1.95)	6 (2.13)
Living arrangements			
	Live alone	134 (43.50)	116 (41.14)
	Live with parents	62 (20.13)	46 (16.31)
	Live with partner/spouse	54 (17.53)	44 (15.60)
	Supported accommodation	15 (4.87)	14 (4.97)
	Live with children	11 (3.57)	12 (4.26)
	Live with other family	8 (2.60)	6 (2.13)
	Live with friends	5 (1.62)	8 (2.84)
	Other	19 (6.17)	14 (4.97)
Age of onset of voices			
		M=22.98 (SD=11.83)	M= 25.23 (SD=13.21)
Care team			

	Adult mental health team	201 (65.26)	174 (61.48)
	Early intervention for psychosis service	62 (20.13)	47 (16.61)
	Inpatient unit	41 (13.31)	60 (21.20)
	Other	4 (1.30)	2 (0.71)
Diagnosis[a]			
	Schizophrenia	132 (42.86)	120 (42.40)
	Psychosis not otherwise specified	71 (23.06)	69 (24.38)
	Depressive episode/disorder	48 (15.58)	46 (16.25)
	Borderline personality disorder	32 (10.39)	48 (16.96)
	Schizoaffective disorder	29 (9.42)	21 (7.45)
	PTSD / Complex PTSD	22 (7.14)	14 (4.95)
	Other anxiety disorder	13 (4.22)	14 (4.95)
	Bipolar affective disorder	10 (3.25)	13 (4.59)
	Other	11 (3.57)	15 (5.65)

M=mean, SD=standard deviation. [a] Multiple diagnoses may have been endorsed, hence the percentage does not sum to 100.

Each DTV content category (e.g., voices making direct threats, saying that other people will harm them, direct criticisms, etc.) was endorsed by at least 40% of participants. Voices criticised more often than spoke of threats (Table 3). Passive listening was more common than believing and active listening. Half of the participants endorsed believing DTVs most or all of the time and over half passively listened to them most or all of the time. Actively listening was endorsed less (Table 4). Of part B participants, 221 (78.92%) screened positive for depression, and 189 (67.50%) for GAD.

Table 3. Voice characteristics.

			Part A (N=308)	Part B (N=283)
			Data are n (%) unless otherwise stated	
PSYRATS				
	Frequency		M=2.62 (SD=1.08)	M=2.59 (SD=1.16)
	Duration		M=2.78 (SD=1.08)	M= 2.94 (SD=1.07)
	Distress		M=2.54 (SD=1.01)	M= 2.59 (SD=1.10)
Voice content				
	'Voices criticise me, or the way I do things'	Yes	286 (93.16)	258 (92.14)
		No	21 (6.84)	22 (7.86)
	Voices tell me that other people are judging me negatively	Yes	238 (78.03)	228 (81.43)
		No	67 (21.97)	52 (18.57)

	'Voices tell me that *other people* are going to harm me'	Yes	190 (62.50)	176 (62.63)
		No	114 (37.50)	105 (37.37)
	'Voices tell me *they* are going to harm me'	Yes	168 (55.26)	174 (61.70)
		No	136 (44.74)	108 (38.30)
	'Voices tell me they are going to harm people I know'	Yes	136 (44.74)	118 (42.14)
		No	126 (41.58)	162 (57.86)
Criticisms of the patient's self-concept made by voices				
	'You are bad'	Yes	258 (82.77)	226 (81.29)
		No	50 (16.23)	52 (18.71)
	'You are worthless'	Yes	244 (79.48)	214 (76.70)
		No	63 (20.52)	65 (23.30)
	'You are a failure'	Yes	235 (76.80)	220 (79.14)
		No	71 (23.20)	58 (20.86)
	'You are weak'	Yes	221 (72.22)	196 (70.25)
		No	85 (27.78)	83 (29.75)
	'You are vulnerable'	Yes	215 (70.72)	190 (68.35)
		No	89 (29.28)	88 (31.65)
	'You are unloved'	Yes	211 (69.18)	186 (66.67)
		No	94 (30.82)	93 (33.33)

M=mean, SD=standard deviation.

Table 4. Listening to and believing DTVs: descriptive statistics

	Sub-scale mean (SD) (N=576)	Illustrative example (N=576)				
			Never n (%)	A bit of the time n (%)	Most of the time n (%)	All the time n (%)
Believing:	5.35 (3.60)	"I believe what the nasty voices say"	94 (16)	186 (32)	173 (30)	123 (21)
Passive listening:	7.24 (3.18)	"There's nothing I can do but listen to what the nasty voices say"	87 (15)	156 (27)	153 (27)	179 (31)
Active listening:	4.04 (3.32)	"I listen out for the nasty voices"	231 (40)	161 (28)	106 (18)	78 (14)

LB-A

The polychoric correlation matrix was assessed for multicollinearity ($r \geq 0.90$). One item was subsequently removed *("I believe most of what the nasty voices say").* Bartlett's test for sphericity confirmed that correlations between items were sufficiently large for EFA (X^2=14092, df=990, p<.001). Sampling adequacy was 'marvellous' according to the Kaiser-Meyer-Olkin test (Kaiser, 1974).

Using Kaiser's criterion (eigenvalues >1.0), a seven factor solution was indicated. The scree plot indicated three or four factors before the point of inflection, whilst parallel analysis indicated a six-factor solution. EFA was therefore carried out with three, four, and six factors. The highest cumulative

variance was explained by the four-factor solution. The four-factor solution explained 59% of the cumulative variance (*active listening*, comprising items related to purposefully tuning into DTVs; *passive listening*, comprising items related to listening to DTVs, but without the intention of doing so; *believing* DTV content; and *disregarding* DTVs, which comprises items linked to both disregarding voice content and tuning out the voices). Factor loadings following item removal are presented in Table 5.

Table 5. Factor loadings for four-factor EFA solution after item removal for the listening and believing questionnaire (LB-A).

Item		Disregarding nasty voices	Believing nasty voices	Active listening to nasty voices	Passive listening to nasty voices
D1	"What the nasty voices say doesn't matter to me"	0.86			
D2	"I just don't care what the nasty voices say"	0.76			
D3	"When the nasty voices start, I find a way to ignore them"	0.71			
D5	"I avoid getting sucked into the world of the nasty voices"	0.71			
D4	"I tune out the nasty voices"	0.70			
D6	"I can brush off all the negative things that the nasty voices say"	0.59			
B3	I'm convinced what the nasty voices say is true"		0.97		
B4	"I have a gut feeling that what the nasty voices are saying is true"		0.86		
B2	"The nasty voices are right in what they say"		0.85		
B1	"I believe what the nasty voices say"		0.71		
A2	"I want to hear what the nasty voices are saying when they start"			0.97	
A1	"I want to keep listening to what the nasty voices have to say"			0.71	

A3	"I listen hard to the nasty voices to make sure I've heard what they are saying"		0.68	
A4	"I listen out for the nasty voices"		0.56	
P2	"When the nasty voices start it's almost impossible to ignore what they say"			0.82
P4	"There's nothing I can do but listen to what the nasty voices say"			0.69
P3	"I get sucked into the world of the nasty voices"			0.67
P1	"I take in every word the nasty voices say"			0.60

A 4-factor CFA model was subsequently carried out on Part B data. Standardised CFA factor loadings are presented in Table 6. Model fit was reasonably good based on the CFI, TLI, and SRMR and acceptable based on the RMSEA, however, weighted least squares estimation is known to inflate the RMSEA (Xia & Yang, 2019) (robust $\chi 2=293.83$, $df=129$, $p<.001$, CFI=0.96, TLI=0.95, RMSEA=0.07 SRMR=0.07).

Table 6. Standardised CFA factor loadings for the LB-A.

	Item phrasing	Disregarding	Believing	Active listening	Passive listening
D1	What the nasty voices say doesn't matter to me	0.72			
D2	I just don't care what the nasty voices say	0.72			
D3	When the nasty voices start, I find a way to ignore them	0.69			
D4	I tune out the nasty voices	0.71			
D5	I avoid getting sucked into the world of the nasty voices	0.64			
D6	I can brush off all the negative things that the nasty voices say	0.77			
B1	I believe what the nasty voices say		0.82		
B2	The nasty voices are right in what they say		0.81		
B3	I'm convinced what the nasty voices say is true		0.91		
B4	I have a gut feeling that what the nasty voices are saying is true		0.85		
A1	I want to keep listening to what the nasty voices have to say			0.59	

A2	I want to hear what the nasty voices are saying when they start	0.85	
A3	I listen hard to the nasty voices to make sure I've heard what they are saying	0.84	
A4	I listen out for the nasty voices	0.75	
P1	I take in every word the nasty voices say		0.84
P2	When the nasty voices start it's almost impossible to ignore what they say		0.69
P3	I get sucked into the world of the nasty voices		0.80
P4	There's nothing I can do but listen to what the nasty voices say		0.78

The internal consistencies of subscales were good (believing α=0.88, active listening α=0.79, passive listening α= 0.81, disregarding α=0.80). The correlations between factor scores were mostly in the expected direction (see Table 7). Large correlations were found between believing DTVs and both active and passive listening. A large correlation was found between active and passive listening. The disregarding sub-scale, which was designed to be the inverse of listening to and believing DTVs had large negative correlations with believing and passive listening. There was no relationship between disregarding and active listening.

Table 7. Correlation matrix between CFA factor scores for the LB-A.

	Believing	Active listening	Passive listening	Disregarding
Believing	1.00			
Active listening	0.47	1.00		
Passive listening	0.78	0.59	1.00	
Disregarding	-0.56	0.07	-0.55	1.00

The internal consistency of the total score was good (α=0.87). Test-retest reliability over one week was excellent (ICC=0.81, n=48) (Cicchetti, 1994). Active listening, passive listening, and believing each predicted anxiety, depression, and voice related distress, confirming predictive validity. Each simple regression remained significant, with similar R^2 values whilst controlling for both voice frequency and diagnosis (Table 8).

Table 8. Regressions between listening to and believing DTVs and distress. Simple regressions (left), and whilst controlling for: voice frequency (middle), and diagnostic groups (right).

	Depression *df* = 1,278					Depression, whilst controlling for voice frequency *df* = 2, 277					Depression, whilst controlling for four diagnostic groups (BPD, depressive episode/disorder, psychosis and schizophrenia) *df*=5,274				
	β	β^a	R^2	F	p^b	β	β^a	Adjusted -R^2	F	p^b	β	β^a	Adjusted-R^2	F	p^b
Believing	0.88	0.44	0.19	65.08	<0.001	0.86	0.43	0.22	40.74	<.0001	0.80	0.40	0.23	17.87	<0.001
Active listening	0.66	0.31	0.09	28.77	<0.001	0.65	0.30	0.13	21.36	<.001	0.68	0.31	0.20	17.02	<0.001
Passive listening	1.10	0.51	0.26	97.49	<0.001	1.06	0.49	0.27	53.5	<.001	1.00	0.46	0.30	24.44	<0.001

	Anxiety *df* = 1,278					Anxiety, whilst controlling for voice frequency *df* = 2, 277					Anxiety, whilst controlling for four diagnostic groups (BPD, depressive episode/disorder, psychosis and schizophrenia) *df*=5,274				
	β	β^a	R^2	F	p^b	β	β^a	Adjusted -R^2	F	p^b	β	β^a	Adjusted-R^2	F	p^b
Believing	0.80	0.47	0.22	77.02	<0.001	0.79	0.46	0.23	42.65	<.001	0.73	0.43	0.23	17.38	<0.001
Active listening	0.74	0.40	0.16	53.26	<0.001	0.73	0.40	0.18	30.57	<.0001	0.75	0.41	0.24	18.76	<0.001
Passive Listening	0.97	0.52	0.28	105.80	<0.001	0.95	0.51	0.28	54.52	<.0001	0.89	0.48	0.29	23.64	<0.001

	Voice related distress *df*=1,281					Voice related distress, whilst controlling for voice frequency *df*=2,280					Voice related distress, whilst controlling for four diagnostic groups (BPD, depressive episode/disorder, psychosis and schizophrenia) *df*=5,277				
	β	β^a	R^2	F	p^b	β	β^a	Adjusted $-R^2$	F	p^b	β	β^a	Adjusted-R^2	F	p^b
Believing	0.06	0.21	0.04	12.83	<0.001	0.06	0.20	0.10	15.93	<.0001	0.05	0.18	0.04	3.11	<0.01
Active listening	0.05	0.14	0.02	5.42	<0.05	0.05	0.13	0.07	11.96	0.0026	0.05	0.14	0.03	2.63	<0.05
Passive listening	0.11	0.34	0.12	36.83	<0.001	0.10	0.31	0.15	26.13	<.0001	0.11	0.33	0.11	7.94	<0.001

β^a=standardised beta coefficient. p^b=each column of *p* values is corrected for multiple comparisons using the Holm method.

Two models were compared for assessing the appropriateness of calculating a total 'listening to and believing' score. A 3-factor CFA model with a higher order factor (combining active listening, passive listening, and believing) was first carried out. Model fit was reasonably good (robust $\chi 2 = 109.35$, $df = 51$, $p < .0001$, CFI = 0.98, TLI = 0.98, RMSEA = 0.06 SRMR = 0.05). Second, a bifactor model with 3 factors and a general factor was carried out. Model fit was excellent (robust $\chi 2=57.68$, $df = 42$, $p=.054$, CFI=1.00, TLI=0.99, RMSEA=0.04, SRMR=0.04). Internal consistency of the total score was good ($\alpha=0.87$) An analysis of variance (ANOVA) indicated that the bifactor model was a significantly better fit than the higher order factor model. The chi-square was lower for the bifactor model ($\chi 2= 26.81$) than the higher order factor model (68.57). Unlike the higher order factor model, the bifactor model allows the items across different factors to be related to some degree, which is also expected from the theory (for example active listening would be expected to share some common variance with passive listening). Hence a bifactor model was chosen on both statistical and theoretical grounds.

LB-R

The polychoric correlation matrix for all the reasoning items was assessed for multicollinearity. No items met the criteria ($r \geq 0.90$). In order to reduce the item pool, active listening, passive listening, and believing were each regressed onto the 74 items from the reasons questionnaire using the regSEM lasso with lambda (λ)=5 and an iteration step of 0.03. The optimal BIC solution was observed with $\lambda=0.12$. Twenty-one parameters had their paths regularised to <0.01 across all three dependent variables and were omitted from further analysis (Table 9).

Table 9. Regression parameters for the robust maximum likelihood estimate model and regularised lasso models for individual items from the listening and believing questionnaire – reasoning (LB-R).

	Predictors of the 'Believing' latent variable					Predictors of the 'Active Listening' latent variable					Predictors of the 'Passive Listening' latent variable				
	Robust maximum likelihood estimate					Robust maximum likelihood estimate					Robust maximum likelihood estimate				
Item phrasing	Est.	SE	z-value	*p*-value	Lasso model's estimate	Est.	SE	z-value	*p*-value	Lasso model's estimate	Est.	SE	z-value	*p*-value	Lasso model's estimate
They've worn me down, so I have to listen.	-0.002	0.03	-0.07	0.94	0.000	0.030	0.04	0.78	0.43	0.010	0.106	0.04	2.64	0.01	0.095
Because I feel defeated by them.	0.087	0.04	2.27	0.02	0.072	-0.059	0.04	-1.49	0.14	-0.024	0.013	0.04	0.30	0.77	0.017
I feel low and my guard is down.	-0.024	0.03	-0.72	0.47	0.000	0.015	0.04	0.41	0.68	0.000	0.034	0.04	0.96	0.34	0.023
I deserve the things they say.	0.089	0.03	2.85	0.00	0.072	0.016	0.04	0.42	0.67	0.000	0.052	0.03	1.57	0.12	0.015
I don't believe in myself, so I get sucked into what they say.	0.011	0.04	0.31	0.76	0.021	0.007	0.04	0.18	0.85	0.000	-0.059	0.04	-1.58	0.11	-0.036
They are picking on my weak spots –	-0.013	0.03	-0.45	0.66	0.000	-0.050	0.04	-1.34	0.18	-0.022	-0.017	0.03	-0.52	0.60	0.000

things I'm already unsure about.														
What they are saying confirms that I really am a bad person.	0.003	0.03	0.09	0.93	0.009	-0.001	0.03	-0.04	0.97	0.000	-0.032	0.04	-0.92	0.36	-0.005
I don't have the confidence to question the nasty voices.	0.030	0.04	0.82	0.41	0.021	-0.036	0.04	-0.88	0.38	-0.002	-0.015	0.04	-0.39	0.70	0.000
I don't have the confidence to ignore the nasty voices.	0.051	0.03	1.53	0.13	0.036	0.064	0.04	1.75	0.08	0.033	0.067	0.04	1.74	0.08	0.048
I don't have the confidence to ask for other people's opinions, so I only have the nasty voices to guide me.	0.034	0.03	1.12	0.26	0.019	0.057	0.03	1.72	0.09	0.015	0.042	0.04	1.18	0.24	0.007
I don't have the confidence to trust my own mind.	0.005	0.03	0.16	0.87	0.004	-0.030	0.04	-0.76	0.45	-0.016	0.025	0.03	0.71	0.47	0.010
I'm tired so I can't think logically and end up	0.011	0.03	0.36	0.72	0.009	-0.058	0.03	-1.73	0.08	-0.027	0.047	0.03	1.38	0.17	0.047

believing them.															
I don't have the energy to do anything but listen to them.	0.003	0.04	0.08	0.93	0.000	0.072	0.04	1.79	0.07	0.036	0.006	0.04	0.16	0.87	0.000
I don't have the mental energy to keep fighting what they say.	0.002	0.04	0.04	0.97	0.000	-0.021	0.04	-0.58	0.56	-0.003	-0.006	0.04	-0.17	0.86	0.000
I spend time by myself so there are no distractions from what they say.	0.089	0.04	2.42	0.02	0.054	0.003	0.04	0.08	0.94	0.000	0.020	0.04	0.54	0.59	0.016
I spend time by myself so there's nothing else to listen to.	-0.003	0.04	-0.08	0.94	0.000	-0.036	0.04	-0.91	0.36	0.000	0.026	0.04	0.66	0.51	0.017
I spend time by myself so I have time to listen to them.	-0.045	0.04	-1.21	0.23	-0.016	0.058	0.04	1.60	0.11	0.027	0.001	0.04	0.04	0.97	0.000
I spend time by myself so I can't check with other people whether I	-0.024	0.03	-0.72	0.47	-0.002	-0.012	0.04	-0.32	0.75	0.000	-0.054	0.03	-1.87	0.06	-0.028

should believe the voices or not.															
I'm so anxious that I can't do anything but listen.	0.035	0.03	1.13	0.26	0.027	0.033	0.03	0.98	0.33	0.012	0.076	0.03	2.19	0.03	0.057
Otherwise, they might catch me by surprise, and I'll panic.	-0.005	0.03	-0.17	0.87	0.000	0.025	0.04	0.70	0.48	0.011	-0.003	0.03	-0.09	0.93	0.000
I want to be ready to deal with them.	0.029	0.03	0.89	0.37	0.006	0.019	0.03	0.57	0.57	0.004	0.054	0.03	1.66	0.10	0.033
It will help me to prepare an escape from the voices' threats.	0.019	0.04	0.51	0.61	0.008	-0.013	0.04	-0.36	0.72	0.000	0.014	0.04	0.33	0.74	0.009
I need to stand up for myself, so I fight them.	-0.033	0.03	-1.20	0.23	-0.024	-0.013	0.03	-0.42	0.68	-0.007	0.007	0.03	0.26	0.80	0.000
I might be able to change their mind.	-0.044	0.03	-1.48	0.14	-0.034	0.017	0.04	0.44	0.66	0.000	0.004	0.03	0.13	0.90	0.000
What they are saying confirms that people really	-0.012	0.03	-0.35	0.72	0.000	0.020	0.04	0.56	0.58	0.022	-0.035	0.03	-1.03	0.30	-0.006

are out to get me.															
Because it's my responsibility to stop them from hurting other people.	0.017	0.02	0.79	0.43	0.010	-0.008	0.03	-0.27	0.79	0.000	0.008	0.03	0.27	0.79	0.000
I might be able to find a solution to the voices' anger or negativity.	-0.063	0.03	-2.37	0.02	-0.039	-0.018	0.03	-0.62	0.53	0.000	-0.007	0.03	-0.25	0.80	0.000
I don't want to let them win, so I listen to fight them.	0.029	0.03	1.07	0.28	0.007	0.056	0.03	1.89	0.06	0.015	0.034	0.03	1.18	0.24	0.018
I feel suspicious of everyone, so I want to know what the voices are saying.	0.017	0.03	0.59	0.55	0.014	0.087	0.03	2.78	0.01	0.075	-0.019	0.03	-0.66	0.51	-0.013
It might help me understand them, so I can calm them down.	0.042	0.03	1.44	0.15	0.030	-0.019	0.04	-0.52	0.61	0.000	-0.082	0.03	-2.75	0.01	-0.061
It might help me work out	-0.013	0.03	-0.41	0.68	-0.012	0.019	0.03	0.54	0.59	0.007	0.031	0.04	0.81	0.42	0.014

who the voices are.															
It might help me understand what is happening.	-0.004	0.04	-0.10	0.92	0.000	-0.068	0.04	-1.63	0.10	-0.032	-0.029	0.04	-0.68	0.50	-0.002
It might help me understand how I'm hearing voices when other people can't hear them.	-0.048	0.04	-1.33	0.18	-0.032	0.062	0.03	1.79	0.07	0.017	-0.023	0.03	-0.68	0.50	-0.014
It might help me work out why they're picking on me.	-0.008	0.03	-0.23	0.82	0.000	-0.038	0.04	-1.04	0.30	-0.004	0.010	0.03	0.32	0.75	0.000
I want to know why they are talking to me.	-0.037	0.03	-1.08	0.28	0.000	-0.037	0.03	-1.09	0.27	-0.010	0.011	0.03	0.35	0.72	0.027
It might help to work out where they are coming from.	0.014	0.03	0.43	0.67	0.000	-0.043	0.04	-1.04	0.30	-0.013	-0.027	0.03	-0.82	0.41	-0.007
It might help me work out what they could do to me.	0.016	0.03	0.50	0.62	0.002	0.063	0.04	1.65	0.10	0.022	0.027	0.03	0.78	0.44	0.000

I want to work out what helps and what doesn't.	0.001	0.03	0.02	0.98	0.000	0.008	0.03	0.26	0.80	0.000	-0.034	0.03	-1.14	0.25	-0.031
The whole experience fascinates me.	-0.057	0.03	-2.20	0.03	-0.033	-0.009	0.03	-0.29	0.77	0.006	-0.056	0.03	-2.01	0.04	-0.030
I'm trying to figure out why this is happening.	0.009	0.03	0.30	0.76	0.000	0.018	0.04	0.47	0.64	0.000	0.070	0.03	2.20	0.03	0.032
I want to work out why they are saying these particular things.	0.034	0.04	0.97	0.33	0.008	0.077	0.04	1.91	0.06	0.059	-0.012	0.04	-0.33	0.74	0.000
They sound so real.	0.002	0.03	0.07	0.94	0.001	0.004	0.04	0.10	0.92	0.000	0.087	0.03	2.56	0.01	0.059
I'm not familiar with them yet so can't tune them out.	0.022	0.03	0.78	0.44	0.009	-0.027	0.03	-0.97	0.33	-0.005	-0.036	0.03	-1.39	0.16	-0.008
They're unpredictable and come out of nowhere.	-0.038	0.03	-1.52	0.13	-0.022	0.039	0.03	1.35	0.18	0.010	0.064	0.03	2.22	0.03	0.035
Because other things in my life support what the voice says.	0.131	0.03	4.72	0.00	0.107	0.030	0.03	1.10	0.27	0.003	0.059	0.03	2.13	0.03	0.031

I experience visions which back up what the voices say.	-0.014	0.03	-0.54	0.59	0.000	-0.049	0.03	-1.53	0.12	-0.031	0.048	0.03	1.57	0.12	0.040
I experience unusual smells which back up what the voices say.	0.010	0.03	0.35	0.72	0.004	-0.027	0.03	-1.04	0.30	-0.008	0.006	0.03	0.22	0.82	0.000
They sound so unusual or strange.	-0.012	0.03	-0.42	0.68	-0.009	0.032	0.03	1.01	0.31	0.016	-0.067	0.03	-2.29	0.02	-0.035
They are just like real people.	0.029	0.03	0.95	0.34	0.005	0.032	0.03	0.93	0.35	0.007	0.041	0.03	1.32	0.19	0.027
A second voice backs up the first voice.	0.011	0.02	0.48	0.63	0.015	0.007	0.02	0.28	0.78	0.003	-0.033	0.02	-1.51	0.13	-0.019
If I don't listen they get louder.	-0.045	0.03	-1.52	0.13	-0.025	-0.031	0.04	-0.88	0.38	-0.021	-0.048	0.03	-1.60	0.11	-0.021
They keep repeating what they say to make me listen.	-0.027	0.04	-0.73	0.46	-0.003	-0.006	0.04	-0.15	0.88	-0.005	0.059	0.04	1.62	0.11	0.032
They're intelligent and trick me into listening.	-0.026	0.03	-0.92	0.36	-0.005	-0.037	0.03	-1.17	0.24	-0.024	0.014	0.03	0.46	0.65	0.018
They wait until I'm at my weakest	-0.009	0.02	-0.38	0.70	-0.006	-0.013	0.03	-0.42	0.67	-0.003	0.002	0.02	0.09	0.93	0.000

before attacking me.															
They scare me with horrible sounds.	0.057	0.02	2.41	0.02	0.034	0.001	0.03	0.05	0.96	0.000	-0.006	0.03	-0.25	0.80	0.000
They are putting on a performance for me.	-0.012	0.03	-0.48	0.63	-0.011	0.003	0.03	0.09	0.93	0.000	0.025	0.03	0.83	0.41	0.014
They are whispering (or very quiet) so I have to listen harder to hear what they are saying.	-0.001	0.03	-0.04	0.97	0.000	0.029	0.03	1.05	0.29	0.020	0.026	0.02	1.09	0.27	0.009
They tell a convincing story that sucks you into their world.	0.078	0.03	2.74	0.01	0.056	0.046	0.03	1.71	0.09	0.042	0.100	0.03	2.88	0.00	0.071
They lull me into a false sense of security by saying nice things, so I start to trust them and listen to what they say.	-0.049	0.03	-1.88	0.06	-0.045	0.055	0.03	1.72	0.08	0.029	0.037	0.03	1.27	0.21	0.021

They sound unusual so they capture my attention.	-0.003	0.03	-0.10	0.92	0.000	-0.043	0.04	-1.16	0.24	-0.015	0.007	0.03	0.20	0.84	0.000
They say things about me that I wouldn't expect anyone else to know.	0.028	0.02	1.16	0.25	0.025	-0.024	0.03	-0.90	0.37	-0.009	-0.063	0.03	-2.29	0.02	-0.037
I hear the voice of someone I know, and I usually believe that person so I'm more likely to be convinced by what they say.	0.070	0.04	1.79	0.07	0.042	-0.053	0.04	-1.40	0.16	-0.002	-0.082	0.04	-1.95	0.05	-0.036
I hear the voice of someone I know, and I want to work out why they are saying horrible things when they are usually nice.	-0.015	0.04	-0.42	0.68	-0.006	0.063	0.04	1.47	0.14	0.022	0.096	0.04	2.69	0.01	0.052

I hear the voice of someone I know, and it sounds exactly the same as theirs, so it would be odd not to listen.	-0.001	0.04	-0.03	0.98	0.000	0.014	0.04	0.36	0.72	0.000	0.009	0.04	0.25	0.81	0.000
I hear the voice of someone I know, and I don't trust them, so I need to keep listening.	-0.088	0.03	-2.92	0.00	-0.065	-0.010	0.03	-0.31	0.76	0.000	-0.032	0.03	-1.12	0.26	-0.019
I can also imagine what they look like and that makes me get sucked into what they're saying.	0.016	0.03	0.56	0.57	0.014	0.028	0.03	0.91	0.36	0.022	-0.031	0.03	-1.07	0.29	-0.015
It's a special talent to hear things that other people can't.	-0.022	0.03	-0.82	0.41	-0.009	0.016	0.03	0.54	0.59	0.014	-0.010	0.03	-0.34	0.73	0.000
Listening to voices is important to my spiritual	0.004	0.03	0.11	0.91	0.000	0.045	0.04	1.20	0.23	0.028	0.043	0.04	1.13	0.26	0.015

or cultural beliefs.															
Listening will make me smart, because the voices are smart.	0.098	0.04	2.25	0.02	0.073	0.058	0.05	1.28	0.20	0.050	-0.063	0.05	-1.39	0.16	-0.030
I don't have the concentration to do anything else but listen.	-0.002	0.03	-0.06	0.95	0.000	-0.010	0.03	-0.29	0.77	0.000	0.067	0.03	2.24	0.02	0.050
Even though they are nasty, they also give me a bit of company.	-0.008	0.03	-0.24	0.81	0.000	-0.025	0.03	-0.77	0.44	0.000	-0.029	0.04	-0.79	0.43	0.000
Listening to the voice will help me to learn about myself.	-0.004	0.04	-0.12	0.90	0.000	0.150	0.04	3.61	0.00	0.104	0.041	0.04	1.06	0.29	0.010
The voice knows more than I do so I might learn something.	0.095	0.03	2.82	0.00	0.075	0.025	0.04	0.64	0.52	0.000	0.084	0.04	2.30	0.02	0.050
If I don't listen, they'll say nastier things.	0.039	0.03	1.28	0.20	0.020	-0.033	0.03	-1.16	0.24	-0.016	-0.048	0.03	-1.54	0.12	-0.022

Fifty-three items were taken forward to the EFA. Bartlett's test for sphericity confirmed that correlations between items were sufficiently large for EFA (X^2=8611.23, df=1378, p<.001). The Kaiser-Meyer-Olkin test indicated that overall sampling adequacy was 'marvellous' (Kaiser, 1974). Using Kaiser's criterion (eigenvalues >1.0), an 11-factor solution was indicated. The scree plot indicated three or seven factors before the point of inflection. Parallel analysis indicated a 7-factor solution. Factor analysis was carried out with three, seven and 11 factors. The 11-factor solution left some factors with very few items and was deemed theoretically complex for both patients and clinicians to hold in mind when devising a clinical formulation. Hence the 11-factor solution was not carried, forwards. A 7-factor solution explained more of the cumulative variance (49%) than the 3-factor version (38%). The seven factors were: to better understand the voices to deal with the threat (understand); being so worn down it is difficult to resist the voice experience (worn down); I'll learn something insightful (learn); voices use strategies that capture attention (attention); the voices are just like real people (real people); I'm alone so have time and space to listen (alone); the voices are of people I know (I know). Factor loadings and correlations between factors are in Table 10.

Table 10. Factor loadings for 7-factor EFA solution after item removal for the LB-R.

Item phrasing	Worn down	Understand	Learn	Alone	Attention	Real people	I know
I don't have the confidence to ignore the nasty voices.	0.81						
I don't believe in myself, so I get sucked into what they say.	0.74						
I don't have the confidence to question the nasty voices.	0.71						
I don't have the confidence to trust my own mind.	0.67						
Because I feel defeated by them.	0.66						
I deserve the things they say.	0.64						
They've worn me down, so I have to listen.	0.59						
I don't have the confidence to ask for other people's opinions, so I only have the nasty voices to guide me.	0.58						
I don't have the energy to do anything but listen to them.	0.55						
I'm so anxious that I can't do anything but listen.	0.5						
I feel low and my guard is down.	0.39						
I want to know why they are talking to me.		0.77					

I want to work out why they are saying these particular things.	0.77			
I'm trying to figure out why this is happening.	0.72			
It might help me work out who the voices are.	0.65			
It might help me understand how I'm hearing voices when other people can't hear them.	0.65			
It might help me work out what they could do to me.	0.63			
I want to be ready to deal with them.	0.4			
I don't want to let them win, so I listen to fight them.	0.38			
Listening to the voice will help me to learn about myself.		0.74		
The voice knows more than I do so I might learn something.		0.73		
Listening will make me smart, because the voices are smart.		0.67		
Listening to voices is important to my spiritual or cultural beliefs.		0.65		
It's a special talent to hear things that other people can't.		0.49		
I spend time by myself so there's nothing else to listen to.			0.89	
I spend time by myself so there are no distractions from what they say.			0.82	
I spend time by myself so I have time to listen to them.			0.72	
They are putting on a performance for me.				0.75
They sound so unusual or strange.				0.52
They scare me with horrible sounds.				0.5
They lull me into a false sense of security by saying nice things, so I start to trust them and listen to what they say.				0.41
They are whispering (or very quiet) so I have to listen harder to hear what they are saying.				0.39

They're intelligent and trick me into listening.	0.37		
They tell a convincing story that sucks you into their world.	0.37		
They are just like real people.		0.78	
They sound so real.		0.58	
A second voice backs up the first voice.		0.45	
They're unpredictable and come out of nowhere.		0.35	
I hear the voice of someone I know, and I want to work out why they are saying horrible things when they are usually nice.			0.88
I hear the voice of someone I know, and I usually believe that person so I'm more likely to be convinced by what they say.			0.78

Understand=to better understand the voices to deal with the threat, worn down= being so worn down it is difficult to resist the voice experience, Learn= I'll learn something insightful, Attention= voices use strategies that capture attention, Real people= the voices are just like real people, Alone= I'm alone so have time and space to listen, I know= the voices are of people I know.

A correlated 7-factor CFA model was performed on Part B, including adjustments (3 sets of correlated items) based on the modification indices. Fit indices were adequate on all indices (robust $\chi 2=446.89$, *df*=326, *p*<.001, CFI=0.96, TLI=0.95, RMSEA=0.04, SRMR=0.05). Internal consistencies of the subscales were good to excellent (Real people α=0.71, Attention α= 0.73, Understand α= 0.80, I know α=0.80, Learn α=0.81, Alone α=0.85, Worn down α=0.88). Standardised CFA factor loadings for the LB-R are presented in Table 11.

Table 11. Standardised CFA factor loadings for the LB-R.

Item phrasing	Understand	Worn down	Learn	Attention	Real people	Alone	I know
It might help me work out what they could do to me.	0.73						
I'm trying to figure out why this is happening.	0.71						
It might help me work out who the voices are.	0.66						
I want to be ready to deal with them.	0.61						
I don't want to let them win, so I listen to fight them.	0.60						

I don't have the energy to do anything but listen to them.	0.77			
I'm so anxious that I can't do anything but listen.	0.77			
Because I feel defeated by them.	0.74			
I don't have the confidence to ignore the nasty voices.	0.74			
They've worn me down, so I have to listen.	0.73			
I don't have the confidence to trust my own mind.	0.64			
The voice knows more than I do so I might learn something.		0.79		
Listening to the voice will help me to learn about myself.		0.77		
Listening will make me smart, because the voices are smart.		0.76		
Listening to voices is important to my spiritual or cultural beliefs.		0.47		
They're intelligent and trick me into listening.			0.68	
They tell a convincing story that sucks you into their world.			0.64	
They are putting on a performance for me.			0.57	
They lull me into a false sense of security by saying nice things, so I start to trust them and listen to what they say.			0.57	
They are whispering (or very quiet) so I have to listen harder to hear what they are saying.			0.49	
They sound so real.				0.88
They are just like real people.				0.72
They're unpredictable and come out of nowhere.				0.49
I spend time by myself so there are no distractions from what they say.				0.88
I spend time by myself so there's nothing else to listen to.				0.81
I spend time by myself so I have time to listen to them.				0.73

I hear the voice of someone I know, and I usually believe that person so I'm more likely to be convinced by what they say.	0.88
I hear the voice of someone I know, and I want to work out why they are saying horrible things when they are usually nice.	0.76

Understand=to better understand the voices to deal with the threat, worn down= being so worn down it is difficult to resist the voice experience, Learn= I'll learn something insightful, Attention= voices use strategies that capture attention, Real people= the voices are just like real people, Alone= I'm alone so have time and space to listen, I know= the voices are of people I know.

Correlations between factors are presented in Table 12. Whilst the factors are measuring theoretically distinct concepts, as expected, several are also related. Four sets of variables have more than 50% shared variance: understand and attention, worn down and alone, worn down and real people, learn and attention. This may increase the likelihood of potential suppressor effects when all seven variables are entered into the later SEM. Given that the factors represent theoretically distinct constructs all are retained, despite the correlations between them, so that patients have a greater choice of potential intervention targets.

Table 12. Correlations between seven factors of the LB-R after CFA.

	1	2	3	4	5	6	7
Understand (1)	1.00						
Worn down (2)	0.66	1.00					
Learn (3)	0.61	0.46	1.00				
Alone (4)	0.54	0.72	0.43	1.00			
Attention (5)	0.70	0.60	0.76	0.53	1.00		
Real people (6)	0.65	0.71	0.37	0.53	0.62	1.00	
I know (7)	0.43	0.23	0.35	0.22	0.50	0.31	1.00

Understand=to better understand the voices to deal with the threat, worn down= being so worn down it is difficult to resist the voice experience, Learn= I'll learn something insightful, Attention= voices use strategies that capture attention, Real people= the voices are just like real people, Alone= I'm alone so have time and space to listen, I know= the voices are of people I know.

A 7-factor CFA model with a higher order factor was carried out in order to assess the appropriateness of calculating a total 'reasons for listening to and believing' score. Model fit was adequate (robust $\chi 2=500.84$, $df=340$, $p<.001$, CFI=0.94,TLI=0.93, RMSEA=0.04 SRMR=0.07). Internal consistency was excellent ($\alpha=0.91$). One week test-retest reliability for the total score was excellent

(ICC=0.90, n=48). Table 13 presents simple regressions which show that each of the seven factors predicted the degree of active listening, passive listening, or believing nasty voices.

Table 13. Simple regressions between seven factors for the LB-R and three factors from the LB-A.

	Believing				Active listening				Passive listening			
	β	R^2	F [a]	p[b]	β	R^2	F [a]	p[b]	β	R^2	F [a]	p[b]
Understand	0.33	0.20	69.17	<0.001	0.35	0.50	270.40	<0.001	0.49	0.41	192.40	<0.001
Worn down	0.56	0.64	482.70	<0.001	0.24	0.26	97.04	<0.001	0.68	0.84	1385.00	<0.001
Learn	0.25	0.12	37.04	<0.001	0.31	0.39	173.10	<0.001	0.23	0.09	25.85	<0.001
Attention	0.46	0.22	78.54	<0.001	0.47	0.51	285.30	<0.001	0.59	0.33	132.70	<0.001
Real people	0.47	0.37	157.80	<0.001	0.22	0.18	58.14	<0.001	0.60	0.52	294.30	<0.001
Alone	0.31	0.23	79.55	<0.001	0.20	0.20	68.95	<0.001	0.45	0.42	195.30	<0.001
I know	0.07	0.01	3.73	0.11	0.14	0.11	35.17	<0.001	0.06	0.01	2.12	0.15

[a]degrees of freedom for all F statistics =1,274, [b]p values adjusted using the Holm method. Factor scores were used for all regressions, hence β values can be compared across regressions. Understand=to better understand the voices to deal with the threat, worn down=being so worn down it is difficult to resist the voice experience, Learn=I'll learn something insightful, Attention=voices use strategies that capture attention, Real people=the voices are just like real people, Alone=I'm alone so have time and space to listen, I know=the voices are of people I know.

Regressing active listening, passive listening, and believing onto the seven latent variables for the reasons questionnaire resulted in eight negative coefficients which were previously positive in simple regressions. These were likely to be suppressor effects caused by shared variance with other predictors (Maassen & Bakker, 2001) and hence were removed before using a backwards elimination approach to identify the remaining significant predictors of listening to and believing nasty voices.

The final three factor SEM regressing active listening, passive listening, and believing onto the remaining latent variables for the reasons questionnaire showed reasonably good fit indices (Figure 2), (robust $\chi 2=1152.73$, $df=700$, $p<.001$, CFI=0.95, TLI=0.95, RMSEA=0.03, SRMR=0.05). The model explained 70% of the variance in passive listening, 52% in believing, and 46% in active listening. The factor labelled 'worn down', which primarily comprises low self-confidence and mental defeat, was a particularly strong predictor of both passive listening to and believing DTVs.

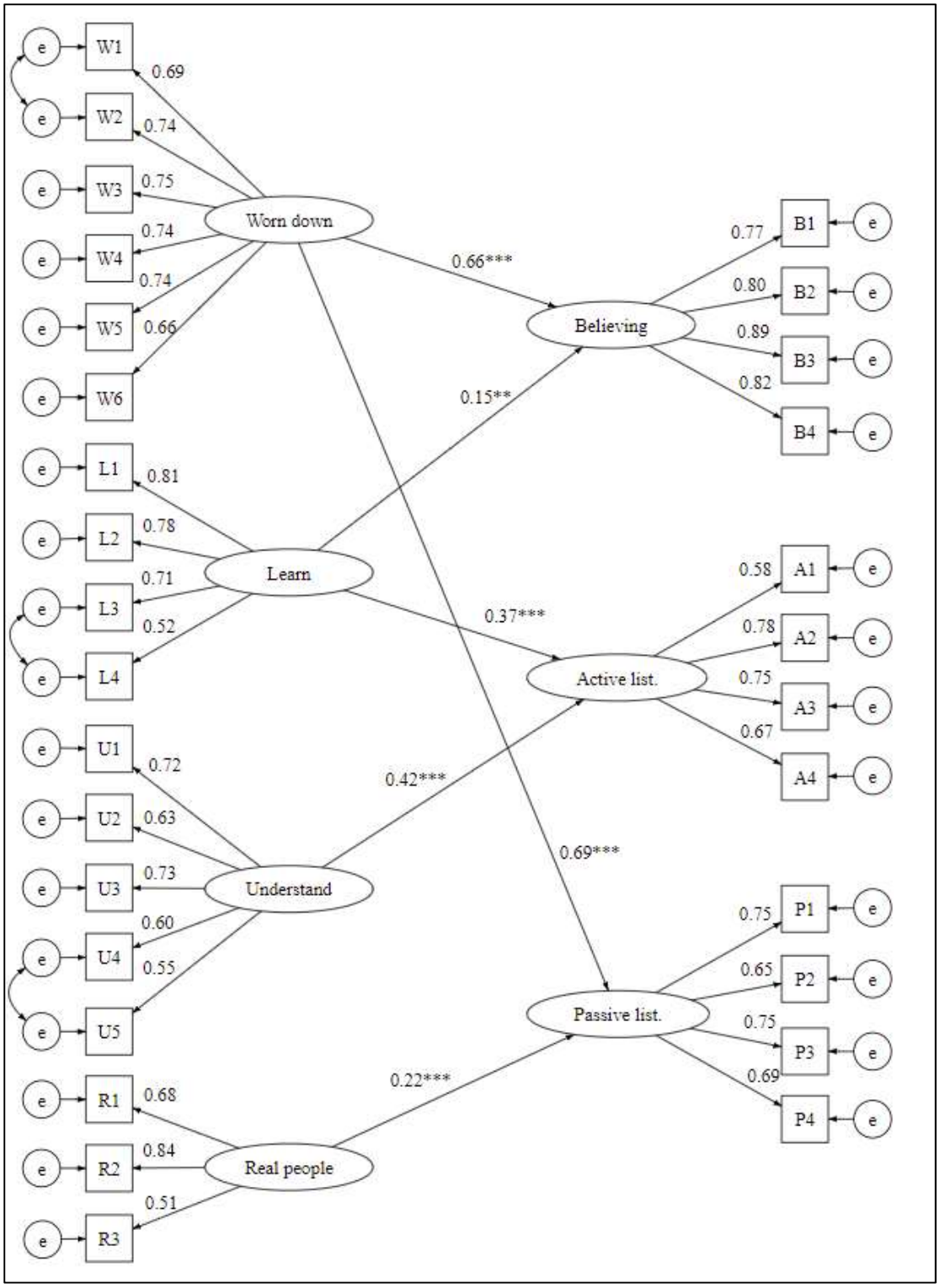


Figure 2. Final 3-factor SEM of the relationship, after backwards elimination, between listening to and believing nasty voices and the reasons.

Standardised beta coefficients are reported alongside the following *p*-value cut-offs: *p*<0.01**, *p*<0.001***. The first item for each factor was fixed to 1. All factor loadings were significant at *p*<0.001.Understand=to better understand the voices to deal with the threat, worn down= being so worn down it is difficult to resist the voice experience, Learn= I'll learn something insightful, Real people= the voices are just like real people.

Simple regressions indicated that the disregarding sub-scale of the LB-A - within which higher scores indicate lower levels of listening to and believing DTVs - was significantly predicted by feeling worn down, a perception that the voices are just like real people, and spending time alone with time and space to listen. Regression coefficients are presented in Table 14. Based on the simple regressions, only the reasoning factors which significantly predicted disregarding were entered into the SEM (worn down, real people, and alone). After the backwards elimination approach worn down was the only significant predictor of disregarding DTVs (β = -.34, SE=0.05, p<0.0001).

Table 14. Simple regressions between factor scores for seven reasoning subscales (LB-R) and disregarding (LB-A).

	Disregarding			
	β	R^2	F [a]	p[b]
Understand	-0.08	0.02	4.94	0.11
Worn down	-0.31	0.32	127.80	< 0.0001
Learn	-0.01	0.00	0.09	0.76
Attention	-0.09	0.02	4.13	0.13
Real people	-0.27	0.20	67.44	< 0.0001
Alone	-0.11	0.04	12.60	0.023
I know	-0.04	0.01	2.05	0.31

[a] degrees of freedom for all F statistics =1,274, [b]p values adjusted using the Holm method. Understand=to better understand the voices to deal with the threat, worn down= being so worn down it is difficult to resist the voice experience, Learn= I'll learn something insightful, Attention= voices use strategies that capture attention, Real people= the voices are just like real people, Alone= I'm alone so have time and space to listen, I know= the voices are of people I know.

LB-R: 16-item short form version (Appendix E)

A regSEM lasso was estimated with λ=2 and an iteration step of 0.03. The BIC was lowest with a λ=0.03. Sixteen parameters had non-zero coefficients and were entered into CFA. The 16 parameters included six out of seven of the latent variables ('*I hear the voice of someone I know*' was excluded). Model fit was adequate (robust χ2=164.22, *df*=98, p<.001, CFI=0.95, TLI=0.94, RMSEA=0.05 SRMR=0.05). Internal consistency was excellent (α=0.88). The higher order factor for the 16-item version significantly predicted the higher order factor for the degree of listening to and believing DTVs (unstandardised β=0.89, standard error=0.13, p<0.001). The higher order factor was strongly associated with the full 28-item version (r(274)=0.96, p<0.001), explaining 93% of the variance.

LB-R: 5-item brief measure (Appendix F)

The highest beta coefficients across different factors (worn down, real people, attention, understand and learn) from the regSEM analysis (LB-A factors regressed onto LB-R items) formed a 5-item scale

with α=0.71, and a correlation of 0.90 with the total score from the full 28-item version (explaining 81% of the variance in the full version). The items which formed the five-item short form were:

- "I pay attention to what the nasty voices say because:
    - "I'm so anxious that I can't do anything but listen";
    - "I'm trying to figure out why this is happening";
    - "They sound so real";
    - "The voice knows more than I do so I might learn something";
    - "They tell a convincing story that sucks you into their world".

These items are the five appraisals that are most predictive of listening to and believing DTVs, across the different LB-R factors.

Discussion:

This Chapter aimed to broaden the understanding of the potential causes of distress in voice hearers. The focus was on one type of voice experience: hearing derogatory or threatening voices. It was hypothesised that listening to the negative content and believing it to be true would heighten emotional distress. It was also hypothesised that patients would have multiple motivations to listen to and believe the voices. It was found that listening to and believing DTVs is common: half of the participants endorsed a high degree of believing the threats and criticisms. Passive listening to voices (i.e., without any sense of intent) most or all of the time was endorsed by 58% of participants and was an even more common occurrence than active listening (32%). Given that participants endorsed hearing a range of threats and criticisms from voices, it is consistent with the hypothesised theoretical perspective that overall levels of depression and anxiety in the participant group were high. Within the group, higher levels of active listening, passive listening, and believing nasty voices were each significantly associated with higher levels of anxiety, depression, and voice-related distress, even when controlling for voice frequency. Passive listening explained approximately one-quarter of the variance in depression and anxiety, and believing DTVs explained approximately a fifth of the variance. Psychological strategies which enable voice hearers to disengage from listening to and believing derogatory and threatening content could have the potential to provide an innovative route to reduce distress. This requires explicit testing.

Analysis of the data indicated that there were seven different types of reasons for listening to and believing DTVs. These are now measurable via a 28-item assessment scale (Appendix D) and shortened versions (Appendices E & F) which correlate very highly with the longer version. The reasons (e.g. to better understand the voices to deal with the threat) are logical and reasonable

responses to the very real experience of hearing a voice. The final SEM model indicated that the reasons accounted for the majority of variance in passive listening, and half of the variance in believing and active listening. Believing DTVs was strongly predicted by being worn down (comprising low self-confidence and mental defeat) and, to a lesser extent, the view that voices are a valuable source of information ('I might learn something insightful'). Passive listening was also strongly predicted by being worn down, and to a lesser degree by how real the voices sounded. The potential importance of feeling worn down builds on previous findings that low self-confidence is common for voice hearers (Freeman et al., 2019), and that both low self-worth in comparison to voices (Birchwood et al., 2004) (social rank) and feelings of entrapment (Rooke & Birchwood, 1998) are associated with depression in voice hearers. Cross-sectional data requires very cautious interpretation, but it is plausible that building self-confidence and overcoming mental defeat could be particularly helpful for voice hearers to begin to question the veracity of DTV content and to foster greater control over whether they choose to listen.

Believing and passive listening, but not active listening, were associated with feeling worn down in the final SEM. Active listening was associated with reasons relating to the positive consequences of engagement, which fell into two categories: an opportunity to better understand the voices in order to deal with the threat (e.g., '*It might help me work out what they could do to me*'), and an opportunity to learn something insightful (E.g. '*Listening to the voice will help me to learn about myself*'). Helping people alter the view that voices are a trustworthy source of information could help enable patients who hear DTVs to choose to direct their attention away from voices and towards meaningful activities and interests that can help improve mood.

The key limitation of the study is the cross-sectional design. The direction of the association between listening to and believing DTVs and negative affect cannot be determined. Given that defeat and low self-confidence are psychological experiences closely linked to the experience of low mood, it is probable that depression also leads to passive listening. A bidirectional relationship is most plausible. Causal interventionist tests are required to assess both directional pathways. It is notable that listening to and believing DTVs was more closely associated with the more distal measures of anxiety and depression than voice related distress. However, the relationship is likely affected by the use of a single-item question from the PSYRATS to assess voice-related distress. The size of association should therefore be interpreted cautiously. Lastly, the assessment of predictive validity was limited to negative affect. The LEAP and qualitative interview study from Chapter Two highlighted that listening

to DTVs can also lead to other negative reactions such as confusion, and greater conviction in delusional beliefs. These relationships remain to be assessed.

It is also notable that the majority of variance in distress remains unexplained. There are likely other contributors to the occurrence of negative affect in this group, including perceptions of the controllability over illness (Birchwood et al., 1993), loss of social roles such as employment, experiences of stigma (Xu et al., 2016) and social isolation, elevated worry (Freeman et al., 2019), and the impact of other psychotic experiences (e.g. paranoia). Depression and anxiety disorders, which are known to be elevated in people with psychosis (Birchwood et al., 1993), may also be separate co-occurring clinical disorders. There is also room for improvement in explaining the reasons why patients believe and actively listen to DTVs. Around half of the variance in believing and active listening was unaccounted for by the reasons scale. When asked about unmeasured factors that could affect believing and active listening the LEAP proposed that believability could be influenced by the quality of evidence that voices use to back up their criticisms and threats. And that one might be more inclined to actively listen out for the voice's perspective in a new environment when the perceptual system is generally more alert to threat. These could be assessed in future research and integrated into the current theory.

Given the importance of appraisals about feeling worn down, a future avenue for this programme of research is to identify potential contributors to the perception that one is too worn down to resist the voice hearing experience. The theoretical concept of 'worn down' comprises items describing low confidence in relation to voices, high mental defeat, and low energy. Plausible contributors are first, sleep disruption, which is common in psychosis (Reeve, Sheaves, et al., 2018) and has been shown to increase negative affect and negative beliefs about the self (Reeve, Emsley, et al., 2018). Second, global negative beliefs about the self are common for voice hearers (Freeman et al., 2019) and may also lead to more specific appraisals about confidence in relation to voices. Traumatic experiences have previously been shown to predict voice related appraisals (Andrew et al., 2008) and could also plausibly lead to appraisals about mental defeat. Another avenue for future research is the potential contribution of neuropsychological functioning (e.g., verbal distractibility and inhibitory control) in determining whether or not voices are listened to (Daalman et al., 2011).

Active listening, passive listening, and believing DTVs are complementary to existing appraisal frameworks and provide a new perspective on voice distress. The reasons for listening to and believing DTVs form mechanisms that can be targeted with clinical interventions. The key test is

whether targeting these mechanisms leads to concomitant reductions in listening to and believing DTVs, and subsequently to decreases in distress. This study shows that targeting perceptions of being too worn down to resist the experience may be a particularly important mechanism to better understand and target via clinical interventions in order to reduce listening to and believing DTVs.

4

The challenges and opportunities of social connection when hearing DTVs: A thematic analysis with patients experiencing psychosis

Abstract:

Rationale: In Chapter Two social isolation was a prominent theme in patient accounts of DTVs, and a time of vulnerability for listening to and believing DTVs. This study sought to learn about the patient experience of being around other people when hearing DTVs. **Method:** A secondary analysis was undertaken of the qualitative interview study reported in Chapter Two. Participants were 15 patients hearing DTVs in the context of non-affective psychosis, and attending mental health services. Data were obtained by semi-structured interviews and analysed using thematic analysis. **Results:** Three themes were identified: i) reasons why interacting with people is difficult when hearing DTVs; ii) the relationship between social connection and DTVs and iii) factors that enable voice hearers to connect with others. A further ten sub-themes were outlined as reasons why hearing DTVs led to lower social connection, including difficulties during conversations (e.g. the *concentration required is hard*), negative expectations of interactions (e.g., *fearing negative judgement from others*) and difficulties sharing experiences of voices (e.g., *people will be hurt or upset if I tell them about the voices*). Isolation was a common response to hearing DTVs but also a time of vulnerability for hearing voices. Managing the challenges of interacting with people led to some improvements in DTVs. **Conclusions:** There are understandable reasons why hearing DTVs leads to lower social connection. Yet isolating oneself can also be a time of vulnerability for DTVs. Social connection might be one vehicle for disengaging from and disputing derogatory and threatening voice content. The clear next step is a quantitative assessment of the potential relationship between social connection and listening to and believing DTVs.

This chapter is adapted from the journal article attached in Appendix Ic: Sheaves, B., Johns, L., Černis, E., Griffith, L., Freeman, D., 2021. The challenges and opportunities of social connection when hearing derogatory and threatening voices: A thematic analysis with patients experiencing psychosis. Psychology and Psychotherapy: Theory, Research and Practice 94, 341–356. https://doi.org/10.1111/papt.12303

.

Introduction

> "The worst thing I did was when I was 16 I didn't tell anyone. And then I ended up like having a complete breakdown when I was 18 and I think that could have been averted if I had actually reached out to someone."
>
> (Participant V7).

Social isolation was a prominent theme described by patients in the qualitative study reported in Chapter Two. Existing quantitative studies have shown that feelings of loneliness, and reduced social networks are common in psychosis (Meltzer et al., 2013; Michalska Da Rocha et al., 2018) and evident even from the first episode (Sündermann et al., 2014). Social isolation is an important issue in itself and also predicts the later severity of symptoms (Norman et al., 2005; Salokangas, 1997), and the likelihood of a later inpatient admission (Norman et al., 2005). The odds of psychotic experiences persisting in the general population are halved for those who are married, as compared to single people (DeVylder et al., 2015) and being single whilst living in a neighbourhood with fewer single people, increases the incidence of schizophrenia, likely due to increased isolation (Van Os et al., 2000). Relationships with other people are important determinants of the course of psychosis, yet understanding the reasons why patients become isolated, and ways in which they might overcome isolation has received surprisingly little academic focus.

Reasons why hearing DTVs might lead to lower social connection

There are several candidate reasons why DTVs might reduce the quality and availability of relationships. The stress of stigma (Xu et al., 2016) and what voices actually say (e.g., that the patient is in danger) can lead voice hearers to isolate themselves. Being distracted by voices can decrease the quality of interactions, and patient aggression toward others can result in physical distancing to maintain safety (Onwumere et al., 2019). Conversation topics may also be important. Hearing DTVs can be an overwhelming experience, and may therefore be the most salient topic of conversation for a voice hearer. However, there are barriers to disclosing the experience of voice hearing including concerns about upsetting others and fear of stigma and resultant shame (Bogen-Johnston et al., 2017; Mawson et al., 2011; Watkins et al., 2019). This reduces the common ground for conversation topics. The current chapter sought to build on this literature by learning from patients' experiences of being around people whilst hearing DTVs.

Methods:

Participants

The qualitative interview data were obtained within Chapter Two, which had a primary research question: 'why do people listen to and believe DTVs?'. Theoretical sampling was used to recruit participants for the purpose of a grounded theory analysis linked to that primary (but separate) research question. A pilot stage, early in sampling, ensured diversity in terms of age, duration of hearing voices, and employment status. Subsequently, theoretical sampling and eventual theoretical saturation (Corbin & Strauss, 2015) guided recruitment to generate the theory reported in Chapter Two. Hence recruitment was not guided by the aim of the current study.

Fifteen participants were sought from clinical teams within Oxford Health NHS Foundation Trust. BS completed a telephone screen with the referrer and participant. Inclusion criteria were: daily experience (current or past) of DTVs; experience of DTVs for at least three months; a willingness and ability to recall and discuss their experience in detail; fluency in English; age between 18 and 65; and willingness and ability to provide informed consent. Exclusion criteria were: a moderate to severe learning disability; voices caused by an organic syndrome (e.g., dementia, head injury); and voices occurring solely within the context of substance misuse, personality disorder, or a mood episode (depression or mania). Two participants had previously met the interviewer through participation in research trials, the remaining were unknown to the researcher.

Those sampled were predominantly single, white British, unemployed, and either lived alone or with parents (Table 1). All but one participant currently heard DTVs. The majority reported hearing voices whilst talking to other people, but found them either less frequent or more in the background of attention when compared to hearing voices when they were alone.

Table 1. Demographics and clinical characteristics (N=15)

Demographic or clinical characteristic		Frequency
Age		
	≤20	1
	21-30	3
	31-40	5
	41-50	5
	51-60	1
Ethnicity		
	White British	13
	Chinese	1
	Black British	1
Marital status		

	Single	11
	Married/civil partnership	3
	Divorced	1
Employment status		
	Unemployed	10
	Employed (part-time)	2
	Self-employed	1
	Student	1
	Voluntary work	1
Accommodation status		
	Lives alone	6
	Lives with parents	6
	Lives with partner/spouse	2
	Supported accommodation	1
Diagnosis		
	Schizophrenia	10
	Schizoaffective disorder	1
	Psychosis NOS	4
"Do/did you hear voices when talking to other people? What is/was that like?"		
	Yes	4
	Yes, but less often than alone	3
	Yes, but more in the background	3
	No	3
	N/A	1
Reported testing the veracity of voice content by discussing with other people*		
	Yes, successful test	4
	Yes, unsuccessful test	2
	No	8
	N/A	1
Age of onset of voice hearing		
	≤15	4
	16-25	7
	26-35	2
	36-45	1
	46-55	1
Duration of voice hearing (years)		
	1-5 years	5
	6-10 years	0
	11-15 years	3
	16-20 years	4
	21-25 years	2
	26-30 years	1

*E.g. asking if other people also heard the voice, or sharing DTV content (e.g. *"I thought I heard you say you hated me, did you really say that?")* for the purpose of finding out whether it is true.

Procedure

The study received NHS ethical approval (ref: 18/SC/0443). A qualitative methodologist, three clinical academic psychologists specialising in psychosis research, and a LEAP consulted on the protocol, topic guide, interview process, and emerging themes. An audio-recorded semi-structured interview was

conducted and transcribed verbatim. Interviews were one-to-one meetings, which lasted around 90 minutes, and took place at the participant's home or NHS clinic. The researcher's background and motivation for conducting the research were shared, and the participants' expertise through their experience emphasised to minimise any potential power imbalance. The interview intended to generate the participants' detailed descriptions of their experience rather than merely responding to closed questions (see Chapter Two methods section for the full topic guide). One question probed social interactions whilst hearing voices (*"Do/did you hear voices when talking to other people? What is/was that like?"*) was asked to all participants. Relationships with others were also raised by participants, unprompted, throughout the interview (e.g. when sharing times that voices were better or worse, or advice for other voice hearers). Further details on the interview process are in supplementary materials. The interviewer's interpretation of descriptions was checked within the interview using pocket summaries.

Analysis

Thematic analysis was used to identify substantive themes across the dataset. Data familiarisation involved listening to the audio tape whilst reading the transcript. A broad code of 'voices and social interactions' was generated to capture any data related to the research question alongside codes for other interpersonal concepts derived from the data (e.g. 'trust' and 'social isolation'). This initial coding took place in parallel to the coding for Chapter Two. BS (a clinical psychologist with experience in psychosis research) conducted all the analysis. A second clinical psychologist specialising in psychosis assessed the appropriateness of each code from those provided by BS. Discrepancies were discussed and a consensus was agreed upon. NVivo 12 (QSR International Pty Ltd, 2018) supported the data coding, organisation, and analysis. Initial analysis revealed reasons why hearing DTVs led to isolation and reasons why social interactions can alleviate DTVs. Preliminary analysis was discussed with the LEAP and two clinical psychologists and additional codes were added: 1) why long-term isolation is not the best solution for voice hearing and 2) ways of managing interactions. All transcripts were subsequently re-coded using this refined framework. A research diary was kept throughout the interviewing and analysis process (see appendices). The final themes and full written results were reviewed by the LEAP and two participants to triangulate the results.

Results:

Three themes were identified as being important to the experience of being around people when hearing DTVs: i) reasons why interacting with people is difficult when hearing DTVs; ii) the relationship between social connection and DTVs and iii) factors that enabled voice hearers to connect with others. Each theme, its corresponding sub-themes, and supporting quotes are outlined below.

1. Reasons why interacting with people is difficult whilst hearing DTVs

1.1 The comments of the voices reduce my trust in others

Voices reduced trust in others by making direct comments *"the voices are telling me people are going to hurt me [..] I can't really walk past people"* (V10). This included comments about a therapist *"just because you have had like one meeting [..] they would be like don't think [..] they are not going to do anything."* (V10). Mistrust towards the voices also became generalised to everyone *"you can't trust people [..] it sort of reflects into my social life because I find it difficult to trust people"* (V13). A participant who heard the voice of a family friend described the impact on her ability to trust her mum: *"I thought that was her helping [the voices], so that changed my view on her for a while"* (V8).

1.2 If I talk to people about the voices, it will hurt or upset them

Many participants felt unable to discuss the derogatory and threatening voice content out of selfless concern for their loved ones: *"I would rather it just scared me than scared anybody else"* (V5). V2 heard the voice of his parents-in-law but felt there were no benefits to sharing this with his wife: *"I don't mean to keep secrets, it's not secrets it's just I don't want her to get hurt by it. [..] there's no good can come from it by telling her.".* He described his wife as "*devastated"* after a previous discussion. V6 did not want his family concerned about him: *"I think I might worry them a bit too much [..] - that I was ill"* and V8 thought that her family would come to harm if she told them: *"if I told someone else they would also know, and then the [voices] would try and kill them as well"* (V8).

Participants were also mindful that voice hearing impacts the dynamics of their relationships, "*imagine there are two pillars supporting the roof and I sort of broke down and he has to be even stronger"* (V4) and V2 was aware of the impact of hearing voices on his young son after the voices told him *"we are going to take him off you"*, he explained, *"I couldn't handle it [..] I had to [..] say look can we take him back to his mum tonight because I just, you know it's not fair me being like this"*. V6 who had found it helpful to check voice content with friends was concerned that this would reduce their perception of his trust in them *"I have insulted them a little bit[..] like I don't trust them".*

1.3 People don't understand what I'm going through

The majority of participants felt that people around them do not understand voice hearing. For some this was due to people's lack of experience: *"it's difficult for anyone who hasn't been through it [..] to understand"* (V2). In some instances the lack of understanding led to people being perceived as dismissive of the participants' experiences: *"she doesn't really understand. I think she has always been one to say that I should just get on and kind of you know forget about [the voices]"* (V1), and lacking empathy: *"They all say it's completely in my head and there's no reality attached to it whatsoever, [..] no one really understands it"* (V15). V2, who invited his parents to listen for the voices *"To see if it [the voice] was there or not,"* further explained *"that was the frustrating part [..] they would say you know within three seconds we can't hear nothing,"* but added, *"As I probably wouldn't if I hadn't been through it".* V4 explained that her family would not listen to her talk about her experiences, *"we just ended up in an argument. They don't want to really listen [..] just say it's illness, take medication".* A lack of understanding resulted in some loved ones being less patient when in social situations *"I am not being rude and not listening to them it's just like I'm petrified listening to something else [..]. They don't understand that do they?"* (V7). This lack of understanding also extended to mental health services: *"I still clam up because I don't really want to tell anyone [what the voices say..] it goes back to CAMHS [..] when I tried to tell them, I wasn't believed"* (V5).

1.4 We don't share the same reality

Hearing DTVs reduced the common ground with other people: "*because of the kind of er more of a focus on trying to rid myself of the noise it's like socially you know I have very little to say in a [..] social situation*" (V1), and because voices were not a shared experience he described *"like I'm living two different lives at once, I have this kind of strange world in my mind and then I have the kind of physical reality of this world"* (V1). For others this led to loneliness: *"Quite, quite sad[..] Because I was the only one who was hearing voices*" (V10). V13 described a sense of disconnect from friends because their lives had not been impacted by voices: *"they have all got families of their own now and grown up, got families of their own, got careers and stuff. I just feel like I got left behind sort of thing".*

1.5 I fear stigma or negative judgement from others

Several participants described difficulty talking to others because of a fear of judgement from others *"I haven't told anyone you know even, even best friend I would never tell them in this much detail. [..]it's you know it sounds mad isn't it, which it is you know"* (V2). Specific negative judgements feared from other people included: *"he is either a pervert, peeping tom or whatever"* (V2), *"either think you*

are lying [..] does she want attention, 'um is there something really wrong, [..] does she need to be put anywhere [into hospital]" (V9), and *"I would be worried in case they take the mick or something"* (V13). For some participants fear of judgement was triggered by voice content: *"it's always been [the voices saying] that everybody else hates you and they don't need you and they think the worst of you"* (V5).

1.6 I might respond to the voices when I'm around other people

Responses to voices in some cases reduced the quality of relationships because *"sadly um they can make you um not so nice to be around"* (V7) by being *"not aggressive but loud and [..] making people feel uncomfortable"* (V7). V4 had noticed the impact on her husband *"there are times I have to shout back to the voices and it does make things depressing for him"*. This also affected others: "*I felt like I had not only embarrassed myself, but I had embarrassed [my family] as well"* (V7), which resulted in apologies, such as *"I had to like say sorry like blurting it out because I heard the voice"* (V13) and led to avoidance, "*the bad results have come off the back of the voices happening. So, you just tend not to want to embarrass yourself as much again"* (V14).

1.7 The voices are listening to my conversation and there may be consequences from what I say

A few participants described purposefully not discussing things for fear of the voices listening *"that's why I stop myself at certain points and I have to go no, [..] I'm not going to talk about that"* (V15) or saying things that they hear, *"I'm having two conversations yeah, sometimes I'm talking to you and I'm saying things that I know they are listening to"* (V15). Sharing voice content was difficult for many participants, and V5 explained that for her this was *"because I know I'm going to get a backlash. [..] I'm not allowed to tell people, that's been drummed into me since I was a kid"*.

1.8 It's confusing, working out who is speaking

A few participants described hearing voices when other people are talking: *"sometimes like I hear my name um being called [..] but sometimes somebody is actually calling me and it's like am I thinking, or hearing it?"* (V7). V7 described this as *"amusing"*, however, V10 found it *"confusing because I don't know who is talking"* while V5 described arguments with family about what they had (or had not) said.

1.9 The concentration required is hard or tiring

Difficulty concentrating on conversations was a common experience: *"when people are talking to me I might find it hard to concentrate on them if I am hearing things"* (V7) and the division of attention was

tiring: *"doing this plus having ten other conversations [..] it's not taxing it's extremely tiring"* (V2). This impacted the ability to chat with people: *"lost how to communicate I suppose verbally"* (V6), attend therapy: *"after ten minutes I was just so exhausted I said look I can't talk anymore"* (V2) and was noticeable to others: *"[my husband] will notice sometimes [..] we could be having a conversation and I will quickly sort of flick and [..] for that split second you are kind of distracted"* (V9).

1.10 Being around people can make DTVs worse

A few participants noted that people can trigger emotion which leads to voices: *"I don't like talking to my mum about [the voices] because she gets upset [..], that makes me start getting upset and then the voices just get worse"* (V10). People could also serve as a direct trigger: *"[the voices] can possess people around me and, and they can start talking through these people. And it's like they are talking at me directly"* (V12). Paranoia, initiated by being around people was also a common source for voice content: *"there was this elderly woman and elderly man[..] I think they were agents. She started talking derogatory, cynical, making fun of me, bullying me. That was a real woman, [..] one of the agents"* (V4). Being around others could also make the threatening voice content more challenging to dismiss: *"When I am in situations when I'm around people that's where I struggle with it feeling so real [..] I will try and work out who is saying it, why they are saying it, [..] I guess that's where the paranoia crosses into things"* (V5).

2. The relationship between social connection and DTVs

2.1 Disengaging from social contact is a common initial response to hearing DTVs

Almost all participants referred to disengaging from social contact in response to hearing DTVs. This was described as 1. Isolating oneself from people *"You know you withdraw, you don't want to talk to people"* (V2); 2. Turning away offered support *"friends would come to see me [..] I was just turning them away"* (V7); 3. Difficulty talking to other people *"I would go and see my family, but I wouldn't say anything to them really"* (V6) and 4. Difficulty sharing the experience of hearing voices *"six months I waited before I told my mum and dad. I had already gone to the doctors at that point [..] I was just so frightened to tell anybody"* (V9). One participant who had heard voices for 15 years had not spoken to any family or friends about hearing them.

V3 described that withdrawal came prior to the onset of his voices, initially as a consequence of depression and anxiety, but triggered his first episode of voices: "*That was sort of I think the first that*

I experienced the voices. So, I think what sort of triggered it was becoming increasingly isolated and isolated from social exposure" (V3).

2.2 Social isolation can be a time of vulnerability to DTVs

Whilst there were clear reasons for isolating oneself, many participants also noted that DTVs more commonly occurred when they were alone: *"I think it occurs if I'm by myself [..] in my bedroom, that's when it will come*" (V11), and *"I tend to hear them when I'm on my, mostly on my own sort of thing"* (V13). When alone DTVs were more central in attention *"when I am kind of on my own [..] they kind of really do occupy my kind of attention"* (V1) and some participants were more inclined to believe what they say *"you could beat any of the strongest people down by you know making them solitary and then keep telling them something until they believed it"* (V2). V6 summarised: *"Not talking to people just made myself worse".*

2.3 The experience of reconnecting and its association with recovery

Whilst some participants were still very isolated: *"the only people that I'm really in contact with on a kind of regular basis, is my mum and her husband. I don't really speak to him much, I speak to my mum occasionally"* (V1), around half of the participants described an increase in their social connections over time *"I had been inside for a month [..] I was getting all these voices, but I didn't really talk about it [..] Because the gym is [..] it's a 100m walk. So, I thought I would just try and, try and do it"* (V3). Some described beginning to accept offers of help *"I have accepted the help of other people I guess. It's only then that I kind of feel like I have had some kind of a life"* (V5), and talking to people more, *"I have been talking to people and I haven't been shut away in my room"* (V10). These participants also tended to be the participants who were less troubled by their voices than previously. However, even those participants who had greater social recovery still chose not to share some voice content: *"they ask me what my voices are saying I still clam up because I don't really want to tell anyone"* (V5).

Several participants noted an association between social connection and an improvement in their management of voices, for example: *"the more I could open up, the more I let my mates know, the more everything has settled down really"* (V5), *"over time talking about it helped so much. Because I found the more I suppressed it the worse it got. [..]"* (V9), and *"a lot of where I have got to now is by talking"* (V7). V3 described intentionally getting a job that involved interacting with other people as a means of managing the voices: *"that's sort of why I got the job, to sort of force myself to go outside and um engage with the world [..] that's the way that I try to manage the voices is by 'um getting*

myself outside". These participants also looked back with the benefit of hindsight. V5 now speaks to friends to check out whether voice content is real or not and explained: *"I wish that's something that somebody had maybe said it's all right to do that".* V7's top piece of advice to others was: *"talk about it,"* he reflected "*the best thing I ever did was talked about it but then the worst thing I did was when I was 16 I didn't tell anyone. And then I ended up like having a complete breakdown".* V3 explained: *"I can't just um stay at home all the time because I know that they will get worse again."*

2.4 Increasing social connection can have benefits for DTVs

For some participants, spending any time with others was still a challenge. But several participants reflected on the positive changes to voices when they were successfully able to manage connecting with other people. These included people providing an opportunity to dispute voice content *"[the voices] are telling me a red van is going to [..]pull me in and drive me off [..] if I voice it and then my mate can be like it's just your voices babe, like look around there's no red van"* (V5) but also whether the voices themselves are real or not: *"I tell friends about it and they say I don't hear anything you know there's nothing there"* (V6). Socialising also moved DTVs into the background of attention: *"I'm focused on the person [..] without even thinking about it I'm just not hearing the voices as much"* (V3). V6 noticed that socialising, *"tends to help them not, not to occur in the first place"*.

3. Factors that enabled voice hearers to connect with others

Around half of the participants discussed improvements in social connection over time. Below are the factors which facilitated social connections.

3.1 Learning to rebuild trust

When voices reduce trust in other people and trigger paranoia, reconnecting requires a process of rebuilding trust, particularly with clinicians: *"when you don't trust anybody there's nothing that a stranger could help you with initially until you have built up trust and built up a relationship"* (V2). This process takes time, *"that's really important that you take the time to let the person trust you"* (V5), and knowledge about that person: "*I suppose just the more you get to know someone I suppose*" (V7). Trusting also involves picking the right people to take that risk with: *"I feel like I have got the right people around me now to be able to trust in doing that,"* but also that *"you have got to have the right support network around you to do that"* (V5). Trust was not a static process, but rather one that changed even on a daily basis: "*I'm only going to let one particular friend in today because she is the one I trust today"* (V5).

3.2 Connecting with other people who hear voices

Several participants noted that meeting people with lived experience of hearing voices (e.g. through voluntary sector organisations) was valued for overcoming several barriers to interacting with people, for example for understanding *"It just helps quite a lot [..] I can talk quite freely and open, openly about things and they are not shocked or they understand"* (V13), having a shared reality *"it would be common ground"* (V2) and for not upsetting family and friends *"Friends and family, they are emotionally affected by your depressive stuff, and I think in the hearing voices group people tend to believe you which people may not get from elsewhere"* (V4).

3.3 Explaining the problem

To mitigate the risk of being judged for responding to voices V2 described explaining to neighbours: *"I said look if you hear me knocking about at night I'm really sorry I'm going through a tough time. [..] she was really lovely, and she was like thank you for coming around"* (V2). V5 felt concerned about stigma, but learned that most people react better than expected: *"the only time you ever hear anything about somebody with schizo anything is when something really bad happens. So, if I tell people, people are going to think that I'm going to do that or I'm going to do this. Whereas actually the more I talk about it now the more people are like, to be fair I would never have noticed [..] and that [..] makes me open up more"*. V7 highlighted the element of choice over the narrative that's shared in order to overcome fears of judgement, *"if I meet people now and I have to explain I say I have got a bit of depression, I get anxiety, I don't like saying I am schizophrenic because that's like a label and they put you in a category,"* while others commented that before sharing a diagnosis it was helpful to *"test the waters"* (V9) to gauge how people might react, or look for signs that it is safe to share.

3.4 If people are judgemental then you can choose to distance yourself from them

Some participants discussed the impact of stigma and misunderstanding related to diagnoses such as schizophrenia: "*when you come across someone that freaks out about it, it throws everything then"* (V5). However several participants had learned to reduce the impact on themselves: *"knowing that there are going to be people that find out, that aren't going to react well to it. And accepting that as well and taking the approach of 'if you don't like it don't be around me'"* (V5). V9 agreed: "*I think in more recent years [..] I have kind of thought [..] if people don't like it that's their problem, not mine. If people are there and love you and accept it then they love you and accept you as well. So, [..] they have got an issue with then they are not worth your time"*.

3.5 Self-acceptance

Opening up to others first required an element of self-acceptance for some participants and overcoming a sense of shame: *"Whereas now I am quite open with it, I just think [..] It is not me but it's a part of me and why should I be ashamed of it?"* (V5). This also required accepting the bad days: *"you are allowed to feel unwell and you are allowed to have this. And just because you have these voices doesn't make you a bad person"* (V9). This facilitated the acceptance of help from others: "*I have accepted the illness and I have understood it [..]I have done what I have needed for me and I have accepted the help of other people"* (V5) and for V6 improved confidence enabled him to start asking his friends whether they had also heard the voices he hears. For V2 self-acceptance occurred spontaneously "*now [..]I can't be bothered to not be me"* but for V5 learning about her diagnosis was important and for V9 non-judgemental healthcare professionals helped: "*Just to have someone there to listen to you and not judge you and understand you"*.

3.6 Knowing that some days it's OK to stay at home

Whilst participants shared many benefits from being around other people, there was acknowledgement that, on some days, staying at home is more helpful, particularly when paranoia is high and this might trigger voices: *"if it's a bad voice day and I can't cope with feeling safe outside I just take a day to stay inside and just watch some films"* (V5) and *"I'm in an open wide space and I'm not used, [..] to it [..] when I get like that I am used to being in my room where I, I feel safe and I can question it"* (V10). V5 explained that this can help overcome paranoia triggered by voices: *"when I'm by myself at least I can check everywhere in here and if there's no one in here I can put it down to my illness. I can trust my eyes".*

3.7 Other people persevering in their efforts to provide support

The persistence of others was valued in overcoming the instinct to disengage from people *"you don't want to talk to anyone and they kept ringing, they kept you know battling through until I spoke to them"* (V2). For V2 this helped because *"it shows they care"* and for V5 it enabled her to question the voice *"I think they have a hard job doing it because when I believe it, it's hard to tell me otherwise. But [..] if they carry on for long enough I will calm"*, while V7 felt emotionally affected by the perseverance: *"how loyal were my friends because they kept coming back [..] I was quite touched by that".*

3.8 Shifting attention from the voices to the person

Some participants described training themselves to be less distracted by voices during a conversation. For some this was an active process *"I like to think I have learned how to communicate better um and make sure instead of being so inward sort of focus on the other person you know,"* (V7) and *"if there were voices then that's how you learn to channel them out by speaking to you and actually listening to you"* (V2), although, for others, it came naturally, *"A lot easier than you realise"* (V12). This was described as: *"A skill that you didn't have before"* (V2).

Discussion

Social support is crucial in recovery from any serious illness. Yet for the participants in this study who experienced DTVs, it was difficult both to be around people and to share the experience of hearing voices, particularly at the early stages of illness. This reduces the opportunity for social support, and at first onset, may lengthen the duration of untreated psychosis. Whilst the initial instinct was to disengage from people, isolation was also described as a time of vulnerability for hearing DTVs. Some participants learned over time that being around people offered an opportunity for distraction and disputing voice content. This suggests that greater social connection may be one route to disregarding DTVs. However, social connection needed to be carefully managed, particularly avoiding interpersonal situations that might trigger voices (e.g., those situations that trigger paranoia or strong emotion).

'Asociality', has previously been conceptualised as a negative symptom of schizophrenia, and defined as a lack of interest in forming relationships (Marder & Galderisi, 2017). Rather than an inherent lack of interest, participants in this study described significant barriers to spending time with others, including difficulties during conversations (e.g., difficulties concentrating and working out who is speaking), voices triggering avoidance (e.g., fear of responding to voices in public, or social interactions triggering voices) and difficulties sharing experiences of voice hearing (e.g., not wanting to upset others and a lack of understanding from others). The difficulty being around people was therefore not driven by a lack of interest, but rather an understandable attempt to avoid negative experiences linked to voice hearing. Indeed, participants were thoughtful about the impact that their voice hearing had on relationships and described feeling touched by people showing that they care. The detailed findings of this in-depth qualitative study clearly warrant further research into the social difficulties experienced by people who hear voices.

There are several potential limitations of this study. First, social interactions by their nature involve more than one person, yet this study learns from only one side of the interpersonal dynamic and at

one particular point in time. Interviewing the social network of voice hearers and clinicians would offer an additional perspective. Second, participants consented to take part in this study which involved talking in depth about their experience, hence the perspectives of people who are unable to talk about their voices are likely less heard and may alter the results. Third, recruitment was not driven by this research question and although there was considerable detail present in the findings data saturation on the topic was not achieved. This particularly applies to those factors which enabled voice hearers to connect with others, which reflect a smaller sub-group of participants. Further studies designed specifically to answer the research question will test the findings from this smaller group.

Whilst this chapter was focused on being around people whilst hearing DTVs, participants were also invited to describe their relationship with their voice(s), owing to the established links between social schemata, voice, and social relationships (Birchwood, Meaden, Trower, Gilbert, & Plaistow, 2000; Birchwood et al., 2004). Many participants described no relationship (e.g. *I don't know. I don't think I really have a relationship with them"*, V1), which parallels results from a previous qualitative study (Chin et al., 2009). Others described the relationship as abusive (e.g. *"Oh, violation, persecution, harassment.",* V4) which is understandable given that all heard DTVs. Given that these data are not related to the experience of being around people, these findings were not included in the resultant themes. However further research investigating social schemata (assessed via quantitative methods or alternative qualitative questions) and their impact on social networks would be valuable, particularly given the existence of relational therapies (Craig et al., 2018b; Hayward et al., 2017).

It was strikingly sad to hear participants describe the sometimes debilitating experience of hearing DTVs, alongside descriptions of feeling unable to talk to people about it, and hence not receiving the social support concomitant with a severe illness. Clearly, at a societal level more work is required to correct the common misconceptions about diagnoses such as schizophrenia. This might reduce the chances of a negative reception towards such diagnoses. Increasing access to existing psychological interventions might also enable a more open dialogue about voice hearing. For example, family interventions provide a safe forum for the social network to discuss voice hearing and are already a recommended treatment (National Collaborating Centre for Mental Health, 2014). Hearing voices groups (Ruddle et al., 2011) and the hearing voices network (Longden et al., 2018) enable voice hearers to meet other people with lived experience of voice hearing. Lastly, interventions already exist which enable voice hearers to tackle shame (Morrison et al., 2016) and social recovery (Fowler et al., 2018). These treatment options might be further optimised by targeting the additional factors

identified in this study such as fostering trust, learning to switch attention, and developing a narrative to explain voices to people. Enhancing treatments for social connections is important in its own right. The potential to also impact voice hearing, as described in this study, suggests that social networks might be a vehicle for disengaging from and disputing DTVs. The relationship between social connection and listening to and believing DTVs now requires quantitative testing. This is investigated within Chapter Five.

5

Potential contributors to the reasons for listening to and believing DTVs

Abstract

Rationale: Chapter three identified seven groups of appraisals associated with listening to and believing DTVs. Appraisals about being worn down particularly accounted for variance in listening to and believing DTVs. A question arises of what contributes to the occurrence of the appraisals. This is an initial investigation of a small number of plausible factors.

Method: A cross-sectional observational study, including mediation models, was conducted. A sub-group of Part B participants from Chapter Three (N=140), who were patients currently hearing DTVs, completed self-report measures of boredom, insomnia, nightmare severity, beliefs about the self, and social connection (potential predictors); listening and believing (the outcome); and the reasons for doing so (potential mediators). Mediation models were built to assess hypothesised pathways (from hypothesised predictor, via the mediator to the outcome) and oppositional pathways (the reverse direction of effect).

Results: Significant inactivity (a precursor to boredom) was reported by 51.4% (n=72) of patients, 66.4% of patients had insomnia (n=93), 63.4% of patients had weekly nightmares (n=89), and 60.7% of patients had strongly held negative self-beliefs (n=85). Higher levels of boredom, nightmare severity, insomnia severity, negative self-beliefs, and lower social connection were significantly associated with listening to and believing DTVs. Insomnia, low self-confidence, and boredom shared bidirectional relationships with listening to and believing DTVs. Appraisals about being worn down mediated individual paths between insomnia (51.1% mediated), boredom (70.0% mediated), negative self-beliefs (58.5% mediated), and listening to and believing DTVs. Worn down was not a significant mediator of any of the oppositional pathways (from listening and believing to insomnia, boredom, or low self-confidence).

Conclusions: This exploratory cross-sectional investigation highlighted that boredom, insomnia, nightmares, and low self-confidence are common problems for patients hearing DTVs. Findings support the theoretical perspective that insomnia, low self-confidence, and boredom are potential contributors to listening to and believing DTVs via appraisals about being worn down. But results require very cautious interpretation given the cross-sectional design, and that the predictors (insomnia, boredom, and negative self-beliefs) were related but modelled separately. A large longitudinal clinical study is needed both to assess the direction of effects and to model the predictors together, to account for their shared variance.

Introduction

Around two-thirds of voice hearers experience DTVs (McCarthy-Jones et al., 2014; Nayani & David, 1996b). Chapter Three identified that half of the patients who heard DTVs endorsed a high degree of believing the threats and criticisms heard, and over half passively listened to what the voices said. Listening to and believing DTVs was associated with depression, anxiety, and voice-related distress. This novel framework, therefore, compliments existing approaches for understanding voice distress and offers a route for the development of psychological treatment.

In Chapter Three seven groups of reasons were identified as to why patients listen to and believe the threats and criticisms that they hear from voices: feeling too worn down to resist the voices; to better understand the threat; to learn something insightful; being alone with time to listen; voices trying to capture attention; voices sounding like real people; and voices sounding like known people. Feeling too worn down to resist the voices was a particularly strong predictor of both believing DTVs and passively listening to them. Being worn down encompasses a group of cognitions related to mental defeat and a perceived lack of energy and confidence needed to dispute the voice content. These appraisals are associated with listening to and believing the threats and criticisms made by voices, which in turn is associated with higher levels of distress. This study set out to identify potential factors that could lead to and maintain the reasons (appraisals) for listening to and believing DTVs.

Chapter Two identified clinical problems for voice hearers that are likely to be times of vulnerability for listening to and believing DTVs. Boredom was commonly described, for example: *"it becomes monotonous. [..] Your brain is going to look for something of interest at some point, [..] you watch TV, you go to the toilet, you watch TV, you go to bed you don't do anything. Do that for five years you will lose your mind"* (V15). Lack of stimulation commonly co-occurred with social isolation, and was a time when voices were more listened to and believed: *"you could beat any of the strongest people down by [..] making them solitary and then keep telling them something until they believed it"* (V2). A lack of self-confidence left voice hearers less able to challenge the threats and criticisms heard: *"if I'm feeling like low [..] and [..] started um thinking bad things about myself [..] It's just easier [for the voices] to get to you when you feel bad"* (V13). Lastly, sleep disruption could make it more difficult to dispute the threats and criticisms made by voices: "*it's not so much the voices are any different to any other day it's my ability to rationalise them."* (V5). This Chapter focuses on whether these psychological problems could plausibly contribute to the reasons for listening to and believing DTVs.

Boredom

Whilst boredom and inactivity were described by several patients with DTVs (Chapter Two), the problem of boredom has received remarkably little scrutiny in relation to severe mental health difficulties (Todman, 2003), including voice hearing. Boredom constitutes a negative affective state which commonly occurs in situations lacking in meaning, interest, or challenge (Struk et al., 2017), and is associated with depression (Eckland et al., 2022). Individual differences occur in the propensity to experience boredom. For example, greater apathy and distractibility are associated with greater boredom proneness (Todman, 2003). These individual differences act in combination with particular activities or environments to result in the experience of boredom. Specifically, activities that are uninteresting, high in monotony, underuse one's capabilities, or general poverty of activity, can all result in boredom (Todman, 2003). Two-thirds of the large group of patients with DTVs recruited in Chapter Three were unemployed, and just under half lived alone. It is plausible that this situation, in addition to the difficulties of concentrating on tasks whilst hearing voices, may induce boredom for people who hear DTVs.

The hypothesis tested was that there is a bidirectional relationship between boredom and listening to and believing DTVs. Specifically, it was expected that boredom would both directly and indirectly lead to greater listening to and believing DTVs. The direct route is that boredom and associated inactivity mean that there are few competitors for the attention system and hence voices are more likely to be listened to. The indirect route is that boredom, inactivity, and the associated negative affect provide the conditions in which beliefs about being worn down are more likely to occur. Specifically, the perception that one is under-stimulated, and not engaging in meaningful activities, can reduce one's confidence in their abilities and increase feelings of mental defeat (components of being worn down). The theory is that appraisals about being worn down subsequently lead to greater listening to and believing DTVs. It is however also likely that greater listening to and believing DTVs leads to greater boredom. It is expected that listening to DTVs disrupts engagement in activities, that believing threats leads to avoidance, and the resultant inactivity increases boredom.

Low self-confidence

Fifty percent of voice hearers report very low self-confidence, and 71% would like to feel more confident (Freeman et al., 2019). Previous research has found associations between negative self-beliefs and negative voice content (van den Berg et al., 2022; Waite et al., 2019), and between negative beliefs about the self and both voice malevolence and omnipotence (Thomas et al., 2015). It

is a clinical problem that has been targeted in a psychological intervention for voice hearers (GiVE trial; Hazell et al., 2018). However because in this trial low self-confidence was not treated (and hence manipulated) in isolation, it was not possible to determine the impact on voice hearing outcomes. Negative self-beliefs have also not yet been quantitatively assessed in relation to the degree of listening to, or believing DTV content. We hypothesised that there was a bidirectional relationship between low self-confidence and listening to and believing DTVs. Specifically, it was expected that believing criticisms from voices would impact self-esteem negatively, and that voice hearers with low self-esteem would lack the confidence needed to dispute or ignore the DTVs that they hear.

Sleep disruption

Sleep disruption is common for people with psychotic experiences. Approximately two-thirds of voice hearers screen positive for the presence of insomnia (Freeman et al., 2019) and frequent distressing nightmares occur in around half of patients with psychosis (Reeve, Sheaves, et al., 2018; Sheaves et al., 2015). Insomnia is a contributory casual factor in the occurrence of hallucinations (Freeman et al., 2017; Sheaves et al., 2016), but neither insomnia nor nightmares have been quantitatively investigated for their effect on patients' responses to voices. We hypothesised that there would be a bidirectional relationship between sleep disruption and listening to and believing DTVs. In line with previous qualitative investigations, it is expected that listening to voices increases insomnia symptoms, for example by delaying sleep onset ("Trying to sleep and [the voices] distract me and they keep me awake", Participant 5, p.6; Waite et al., 2015) and triggers wakefulness after sleep onset ("Suddenly they woke me up, [the voices] need to interrogate me", participant V4; from Chapter Two). However, it was also expected that insomnia would directly lead to patients feeling worn down, and thus more inclined to listen to and believe DTVs.

Social connection

Within Chapter Four, several participants described isolating themselves from other people in response to hearing DTVs. Previous research has shown that isolation predicts the course of psychosis. For example, a five-year follow-up study showed that living with a spouse or informal partner resulted in greater recovery in psychotic symptoms than living alone or with family (Salokangas, 1997). The degree of social support predicted the number of inpatient admissions three years later, independently of age, gender, premorbid adjustment, and duration of untreated psychosis (Norman et al., 2005). Social support has not yet been quantitatively investigated in relation to voice hearing outcomes, specifically, yet the qualitative accounts reported in Chapter Four indicate that a bidirectional relationship between lower social connection and listening to and believing DTVs

is most likely. Threats and criticisms made by voices led to patients disengaging from social connections. Equally, social support was described as a route both to disengaging attention from DTVs, and disputing the veracity of threats and criticisms.

This chapter aimed to:

- Describe the prevalence of clinical problems (boredom, insomnia, nightmares, low self-confidence, and social isolation) that may affect the reasons for listening to and believing DTVs;
- Assess whether these clinical problems potentially contribute to listening to and believing DTVs, via appraisals for listening to and believing DTVs;
- Compare both directional pathways: from the clinical problem, via appraisals, to listening to and believing DTVs and vice versa.

Method:

Design

This was a cross-sectional observational study conducted in 38 NHS mental health trusts across England. The questionnaires were administered to a sub-group of the Part B participants who took part in the larger study reported in Chapter Three. Participants completed informed consent and self-report questionnaire assessments either in paper form, using an online survey platform (JISC; https://www.onlinesurveys.ac.uk), or by reading out answers over the telephone to a researcher whilst viewing a paper copy of the questionnaires.

Participants

One hundred and 40 participants took part in the current study between 27th April 2021 and 3rd December 2021. Participants were recruited via the National Institute of Health Research (NIHR) clinical research network. Participants were identified by referring clinicians or through registers of patients who had previously given consent to be contacted about research. Inclusion criteria for the study were: self-report endorsement of hearing voices at least once per week; endorsing derogatory and threatening voice content (voices threatening to harm the participant; threatening to harm people known by the participant; voices telling the participant that they will be harmed by other people; hearing voices which criticise them; or tell them that other people are judging them negatively); being aged 16 or older; an ability to understand English well enough to complete the questionnaires without the use of a translator; and being under the care of mental health services. There were no exclusion criteria for the study.

Assessment measures

Listening to and believing DTVs questionnaire – assessment (LB-A) (Sheaves et al., 2022)

The LB-A is a self-administered 18-item measure. Response options for each item range from 0 (never) to 3 (all the time). Factor analysis indicates that the measure forms four subscales assessing listening to and believing DTVs: active listening, passive listening, believing, and disregarding. Active listening, passive listening, and believing subscales are summed to create a total score ranging from 0-36. Higher scores indicate greater listening and believing DTVs. Greater listening to and believing DTVs is predictive of distress in voice hearers. The internal consistency of the total score is good (α=0.87).

Listening and believing DTVs questionnaire – reasons (LB-R) (Sheaves et al., 2022)

The LB-R is a 28-item self-administered questionnaire assessing reasons for listening to and believing DTVs. Response options range from 0 (not true for me) to 4 (totally true for me). Factor analysis shows that the items make up seven subscales: to better understand the voices to deal with the threat (understand); being so worn down it is difficult to resist the voice experience (worn down); I'll learn something insightful (learn); voices use strategies that capture attention (attention); the voices are just like real people (real people); I'm alone so have time and space to listen (alone); and the voices are of people I know (I know). Internal consistencies of the subscales are good to excellent (α=0.71-0.88) and each of the subscales predicts the degree of listening to and believing DTVs.

Patient Health Questionnaire-9 (PHQ-9) (Kroenke et al., 2001)

The PHQ-9 is a self-administered nine-item screening tool for depression. It is commonly used within clinical practice and is the most psychometrically evaluated screening tool for depression (El-Den et al., 2018). Response options range from not at all (0) to nearly every day (3). The scale has a one-factor solution, hence items are summed to create a total score (El-Den et al., 2018). Higher scores indicate greater severity. Internal consistency is excellent in primary care patients (Cronbach's α=0.89). As PHQ-9 scores increase, functional status decreases, confirming construct validity (Kroenke et al., 2001). A score of 10 has a sensitivity of 88% and a specificity of 88% for diagnosing major depression when compared to a diagnostic interview (Kroenke et al., 2001).

Generalised Anxiety Disorder Questionnaire-7 (GAD-7) (Spitzer et al., 2006)

The GAD-7 is a self-administered seven-item questionnaire assessing GAD symptoms. Response options range from not at all (0) to nearly every day (3). Higher scores indicate higher levels of

anxiety. The internal consistency of the scale is excellent (Cronbach's α=0.92) and a score of 10 or greater has 89% sensitivity and 82% specificity for diagnosing GAD when compared to a diagnostic interview (Spitzer et al., 2006). A higher score predicts worsening functional status, in support of construct validity (Spitzer et al., 2006). Whilst depression and anxiety commonly co-occur, factor analysis has confirmed that PHQ-8 (PHQ-9 scale with suicidal ideation question omitted) and GAD-7 items form distinct dimensions (Spitzer et al., 2006).

Psychotic symptom rating scales (Haddock et al., 1999)*, voice distress item*

Voice distress was assessed via one question from the PSYRATS (Haddock et al., 1999) for auditory hallucinations scale. Participants completed the question for DTVs (termed 'nasty voices' on the assessment) only and in self-report format, hence the phrasing was: *Over the past week when you heard nasty voices, how distressing were they?* Response options ranged from 0 (*voices not distressing at all*) to 4 (*voices were extremely distressing, you felt the worst you possibly could feel*).

Sleep Condition Indicator (SCI) (Espie et al., 2014)

The SCI is an eight-item assessment for symptoms of insomnia disorder according to the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013). Scores range from 0 to 32, and higher scores indicate better sleep. A clinical cut-off of ≤ 16 correctly identifies 89% of those with probable insomnia disorder. The measure has good internal consistency (Cronbach's α = 0.86) and shows convergent validity with the Insomnia Severity Index (Bastien et al., 2001; Espie et al., 2014).

The Brief Core Schema Scale (BCSS) (Fowler et al., 2006)

The BCSS assesses positive and negative evaluations of self and others. The full scale has a four-component solution: negative-other, positive-other, negative self and positive self-beliefs. Only items relating to positive beliefs about self (6 items) and negative beliefs about self (6 items) were used in the current study. Each item is a global belief (e.g. "I am unloved", "I am talented") and is assessed on a five-point rating scale. Participants are first asked whether they hold each belief (no=0) and if they answer yes, their conviction is rated from believe it slightly (1) to believe it totally (4). Items are summed to create total positive beliefs about self and negative beliefs about self scores. There are large associations between the positive self and negative self scales and the Rosenberg self-esteem scale, supportive of concurrent validity. Cut-off scores for assessing the prevalence of low self-confidence were taken from those used in Freeman et al. (2019): a score of 8 or higher indicated negative self-beliefs, and a score of 5 or less indicated low positive self-beliefs. These cut-offs were

one standard deviation outside of the mean of the non-clinical group (N=754) in the original scale development study (Fowler et al., 2006).

Short boredom proneness scale (SBPS) (Struk et al., 2017)

The SBPS is an 8-item assessment for boredom. Items relate to inactivity (e.g. *"Much of the time, I just sit around doing nothing"*), dissatisfaction with activities (e.g. *"In most situations, it is hard for me to find something to do or see to keep me interested"*) and trait disposition to being bored (e.g. *"It takes more stimulation to get me going than most people").* The factor structure is unidimensional, and the scale correlates with depression, anxiety, mind-wandering and lapses of attention (Struk et al., 2017). Internal consistency in the current participant group was good to excellent (α=89).

The Disturbing Dreams and Nightmare Severity Index (DDNSI) (Krakow et al., 2002)

The DDNSI is a five-item assessment of nightmare severity. Two of the five items were included in the current study: *"How many nightmares in total have you experienced over the past week?"* and "How severe is your problem with nightmares". Nightmare severity was rated on a seven-point Likert scale, ranging from 0 (no problem) to 6 (extremely severe problem). The question regarding nightmare frequency was also therefore rescaled such that the scale ran from 0 to 6. This was so that nightmare frequency and severity contributed equally to the total score, rather than scores on nightmare frequency weighting more heavily on the total score. The internal consistency of the full five-item DDNSI scale in a group experiencing insomnia was excellent (Cronbach's α = 0.91) (Freeman et al., 2017), and in the current participant group, the 2-item version was acceptable (Cronbach's α = 0.77).

An additional separate question was asked to participants who endorsed nightmares: Do you have nightmares about the things that the voices say? (*e.g. if your voices say you are going to be harmed, do you have nightmares about being hurt?).* The answer options were yes/no.

Lubben Social Network Scale – Revised version (Lubben, 1988)

The Lubben Social Network Scale assesses the frequency, quality, and reciprocity of relationships with family and friends. The revised version of the scale omits items relating to helping other people and living arrangements and hence loads less heavily on the reciprocity of relationships than the original version of the scale. In the current study item phrasing was adapted such that family and friends were assessed within the same item (e.g. "*How many relatives do you see or hear from at least once a month?*" and "*How many of your friends do you see or hear from at least once a month?*" were combined to form "*How many friends or relatives do you hear from at least once per month?*"). The

resulting scale had six items (see Appendix G), with higher scores indicating a greater social connection. Internal consistency of the scale in the current participant group was good (Cronbach's α = 0.85).

Analysis

Analysis was conducted in R version 4.0.5 (R Core Team, 2021) using packages lavaan (Rosseel, 2012), psych (Revelle, 2020), and lm.beta (Behrendt, 2014). Any participant with total scores missing for any of the potential predictors, potential mediators, or outcome was removed from the dataset, resulting in a final participant group of 140 (18 participants removed). Descriptive statistics were assessed in order to identify the prevalence of boredom, social connection, and sleep disruption in this group of participants with DTVs.

A Pearson's correlation matrix was run, entering all potential predictors (positive and negative beliefs about self, insomnia, nightmare severity, social connection, and boredom), potential mediators (LB-R subscales), and the outcome (LB-A). This assessed for multicollinearity using a threshold of $r \geq 0.80$. The matrix was also used to identify potential predictors of listening to and believing DTVs. The strongest predictors of listening to and believing DTVs were chosen for entering into the mediation analysis. The mediators were chosen based on the strength of their relationship with both the chosen predictors and the outcome (listening to and believing DTVs). The relationship between the predictors entered into the mediation analysis and distress was assessed using individual regressions with depression, anxiety, and voice distress entered as the outcome.

Simple regressions were conducted between listening to and believing DTVs and three hypothesised predictors, derived from the correlation matrix. Both directional pathways were tested (e.g. from the hypothesised predictor to listening to and believing DTVs, and vice versa). Each variable entered into the analysis was transformed by $\log_{10}(1)$. Transforming the data allowed beta coefficients to be compared across different associations, a method used recently to assess the relationship between insomnia and psychosis (Reeve, Nickless, et al., 2018). The resulting beta coefficient can be interpreted as the percentage increase in the outcome for every 1% increase in the predictor. Owing to scores of zero in several variables, 1 was added to each score before transforming the data. This allowed scores of zero to be retained ($\log_{10}(1)$ is 0, whereas $\log_{10}(0)$ is undefined).

Multivariate normality was assessed using the Shapiro-Wilk test. This was not significant for any of the variables entered into the mediation analysis, hence the bootstrapping test was used to assess for

significant mediation. The Baron and Kenny (1986) definition of mediation was used such that a variable is considered a mediator when variations in the predictor variable significantly account for variation in the mediator (path A), variations in the mediator significantly account for variations in the outcome (path B), and, when paths A and B are controlled, the direct relationship between the predictor and outcome variable (path C) is reduced. Full mediation is indicated when path C is reduced to zero. In this scenario, there is one dominant mediator. If path C is reduced but not to zero, this implies that there are other mediators beyond those tested (Baron & Kenny, 1986). The proportion mediated was calculated using the following equation: (path A*path B)/the total effect. The proportion mediated was compared across the hypothesised and oppositional models.

Results

Description of the participant group

Two-thirds of the participants were male, two-thirds were unemployed and the majority were white British. Two-thirds of the participants had a schizophrenia spectrum diagnosis (Table 1). Of the 140 participants, 85.7% heard voices that threatened them (n=120) and 97.1% heard voices that criticised them (n=136).

Table 1. Demographics and clinical characteristics (N=140)

Variable		Data are n (%) unless otherwise stated
Age		M=40.78 (SD=13.78)
Gender	Male	89 (63.57)
	Female	51 (36.43)
Ethnicity		
	Asian	5 (3.62)
	Black – British, Caribbean, or African	4 (2.90)
	Mixed or multiple ethnic groups	6 (4.35)
	White - British / white - other ethnic group	121 (87.68)
	Other ethnic group	2 (1.45)
Marital status		
	Single	96 (68.57)
	Married / Civil partnership	16 (11.43)
	Divorced	16 (11.43)
	Cohabiting	10 (7.14)
	Widowed	2 (1.43)
Employment status		
	Unemployed	94 (67.14)
	Employed (part-time)	11 (7.86)
	Employed (full-time)	10 (7.14)
	Voluntary work	8 (5.71)
	Retired	7 (5.00)
	Student	5 (3.57)

	Self-employed	2 (1.43)
	Housewife/husband	3 (2.14)
Living arrangements		
	Live alone	54 (38.57)
	Live with parents	28 (20.00)
	Live with partner/spouse	22 (15.71)
	Supported accommodation	8 (5.71)
	Live with children	8 (5.71)
	Live with other family or friends	7 (5.00)
	Other	13 (9.28)
Age of onset of voices		M=24.70 (SD=13.46)
Care team		
	Adult mental health team	93 (66.42)
	Early intervention for psychosis service	20 (14.29)
	Inpatient unit	26 (18.57)
	Day hospital	1 (0.71)
Diagnosis[a]		
	Schizophrenia	57 (40.71)
	Psychosis not otherwise specified	29 (20.71)
	Depressive episode/disorder	24 (17.14)
	Borderline personality disorder	30 (21.42)
	Schizoaffective disorder	11 (7.86)
	PTSD / Complex PTSD	10 (7.14)
	Other anxiety disorder	10 (7.14)
	Bipolar affective disorder	6 (4.29)
	Other	6 (4.29)

M=mean, SD=standard deviation. [a]Some participants had been given more than one diagnosis.

The prevalence of boredom, social isolation, sleep disruption, and low self-confidence

High levels of inactivity, a precursor to boredom, was a common occurrence: 51.4% (n=72) either agreed or strongly agreed with the statement *"much of the time, I just sit around doing nothing"*. With regards to self-confidence, high negative beliefs about the self were common (n=85; 60.7%). Comparatively fewer participants endorsed low positive beliefs about the self (n=58; 41.4%).

Sleep disruption was a common occurrence in the participant group: Two-thirds of the participants screened positive for insomnia according to the SCI (Espie et al., 2014). The rate of weekly nightmares was very similar (n=89; 63.6%), and of those experiencing nightmares, the mean severity rating was moderate to severe. Two-thirds of those experiencing nightmares endorsed having nightmares depicting voice content (e.g., nightmares about being harmed if the voices say they are going to be harmed; Table 2).

Table 2. Prevalence and descriptive statistics for potential predictor variables, and emotional distress (N=140)

		Data are n (%) unless otherwise stated
Beliefs about self (BCSS)	Positive beliefs about self Low positive beliefs about self	Median=7.5 (IQR=9) Yes=58 (41.43) No= 82 (58.57)
	Negative beliefs about self High negative beliefs about self	Median=9 (IQR=13) Yes = 85 (60.71) No 55 (39.29)
Insomnia (SCI)	Positive screen	Yes=93 (66.43) No=47 (33.57) Median = 12 (IQR = 14)
Nightmares (DDNSI)	Endorsing at least weekly nightmares Frequency Problem rating (just those experiencing nightmares) Voice content in nightmares	Yes=89 (63.57) No=51 (36.43) Median=2 (IQR=5) M=3.91 (1.79) Yes=78 (65.00) No=42 (35.00)
Boredom	Total score "Much of the time, I just sit around doing nothing"	M=35.99 (SD=13.26) Disagree (score ≤3): 56 (40.00) Agree (score ≥5): 72 (51.42) Strongly agree (score = 7): 42 (30.00)
Social connection	Total score "How many friends or relatives do you feel close to such that you could call on them for help" "How many friends or relatives do you feel at ease with that you can talk about private matters"	M = 15.62 (SD=7.20) 0 = 24 (17.14) 0 = 34 (24.29)
Depression (PHQ-9)		Positive screen: 109 (77.86) Negative screen: 31 (22.14) M=16.16 (SD=7.46)
Anxiety (GAD-7)		Positive screen: 93 (66.43) Negative screen: 47 (33.57) M=12.79 (SD=6.28)

M=mean, SD=standard deviation.

A significant minority of the participant group endorsed a lack of social connection. A quarter of the participants felt that they had no family or friends with whom they could talk about private matters and 21 participants (15.3%) had not spoken to any family or friends about the fact they hear voices (median number of people spoken to about voices in the whole group=4, IQR=5). Just under a fifth endorsed having no friends or relatives that they could turn to for help (17.1%).

Identifying potential pathways to reasons for listening to and believing DTVs

A large significant correlation was found between negative beliefs about the self and listening to and believing DTVs. Moderate significant correlations were found between both boredom and insomnia,

and listening to and believing DTVs. Small significant correlations were found between both nightmare severity and social connection and listening to and believing DTVs. There was no significant association between positive beliefs about the self and listening to and believing DTVs. The three strongest predictors (negative beliefs about the self, insomnia severity, and boredom) were carried forward to the mediation analysis.

The seven groups of reasons for listening to and believing DTVs (listening to DTVs to better understand the voices to deal with the threat, being so worn down it is difficult to resist the voice experience, voices use strategies that capture attention, I'll learn something insightful, the voices are just like real people, I'm alone so have time and space to listen and the voices are of people I know) were assessed for their relationship with both the chosen predictors (insomnia, boredom and negative beliefs about the self) and the outcome (listening to and believing DTVs). Being so worn down that it is difficult to resist the voice experience tended to have the largest magnitude of relationship with the predictors and outcome. This appraisal had large significant associations with both negative beliefs about the self (predictor) and listening to and believing DTVs (outcome), and moderate significant associations with both insomnia and boredom (predictors). 'Worn down' was therefore carried forward to the mediation analysis.

Table 3. Pearson correlation matrix between potential predictors, reasons for listening and believing (potential mediators) and listening and believing DTVs (outcome)

		Potential predictors						Potential mediators						
		Positive beliefs about self	Negative beliefs about self	Insomnia	Nightmare severity	Social connection	Boredom	Understand	Worn down	Learn	Attention	Real people	Alone	I know
Potential predictors	Positive beliefs about self	1.00												
	Negative beliefs about self	-0.36***	1.00											
	Insomnia	0.22*	-0.53***	1.00										
	Nightmare severity	-0.15	0.38***	-0.34***	1.00									
	Social connection	0.18*	-0.17*	0.12	0.10	1.00								
	Boredom	-0.19*	0.32***	-0.53***	0.21*	-0.24***	1.00							
Potential mediators	Understand	0.08	0.22*	-0.21*	0.19*	0.00	0.24***	1.00						
	Worn down	-0.20*	0.57***	-0.41***	0.23*	-0.13	0.36***	0.50***	1.00					
	Learn	0.12	0.17	-0.13	0.13	-0.13	0.20*	0.47***	0.38***	1.00				
	Attention	0.03	0.25***	-0.27***	0.25***	-0.22*	0.34***	0.47***	0.50***	0.56***	1.00			
	Real people	-0.02	0.28***	-0.38***	0.15	-0.17	0.21*	0.42***	0.50***	0.23*	0.45***	1.00		
	Alone	-0.10	0.30***	-0.32***	0.06	-0.32***	0.39***	0.41***	0.59***	0.34***	0.37***	0.36***	1.00	
	I know	0.08	0.04	-0.01	0.03	-0.09	0.09	0.25***	0.13	0.27***	0.37***	0.23*	0.17*	1.00
Outcome	Listening & believing	-0.12	0.55***	-0.44***	0.21*	-0.17*	0.39***	0.48***	0.76***	0.38***	0.54***	0.50***	0.47***	0.18*

The following *p*-value cut-offs are used: $p<0.05$*, $p<0.01$**, $p<0.001$***. Understand=to better understand the voices to deal with the threat, worn down=being so worn down it is difficult to resist the voice experience, Learn=I'll learn something insightful, Attention=voices use strategies that capture attention, Real people=the voices are just like real people, Alone=I'm alone so have time and space to listen, I know=the voices are of people I know.

Assessing the individual relationships between potential predictors and distress

Boredom was significantly associated with depression ($F(138) = 55.71$, $p<0.001$) with an adjusted R^2 of .28, and anxiety ($F(138) = 23.91$, $p<0.001$) with an adjusted R^2 of .14, but not voice distress ($F(138) = .69$, $p=0.41$), adjusted $R^2 = -.00$. Insomnia was significantly associated with depression ($F(138) = 115.60$, $p<0.001$) with an adjusted R^2 of .45, anxiety ($F(138) = 69.39$, $p<0.001$) with an adjusted R^2 of .33, and voice distress ($F(138) = 6.37$, $p=0.01$) with an adjusted R^2 of .04. Lastly, negative self-beliefs were associated with depression ($F(138) = 84.89$, $p<0.001$) with an adjusted R^2 of .38, anxiety ($F(138) = 75.56$, $p<0.001$) with an adjusted R^2 of .35, and voice distress ($F(138) = 15.44$, $p<0.01$) with an adjusted R^2 of .09.

Assessing the direct relationship between insomnia, boredom and negative self-beliefs and listening to and believing DTVs (Table 4)

Insomnia shows the potential for a bidirectional relationship with listening to and believing DTVs. Both directional pathways were significant, but the coefficient was larger for the path from greater listening to and believing DTVs to more severe insomnia, than the reverse. Negative self-beliefs also show the potential for a bidirectional relationship with listening to and believing DTVs. Both directional pathways were significant, but the pathway from greater listening to and believing DTVs to greater endorsement of negative self-beliefs had the largest coefficient. Indeed the path from greater listening to and believing DTVs to higher negative beliefs about the self had the largest coefficient of all of the associations tested (see Table 4). Boredom showed the potential for a bidirectional association with listening to and believing DTVs. Both directional pathways were significant, but in this instance, the stronger path was from greater levels of boredom to greater listening to and believing DTVs.

Table 4. Testing pathways between insomnia, boredom, and negative self-beliefs and listening to and believing DTVs.

Predictor	Outcome	β [a]	SE	F [b] (df=138)	R^2 [b]	p
Insomnia	Listening and believing	-0.27	0.05	27.30	0.16	<0.001
Listening and believing	Insomnia	-0.60	0.12			<0.001
Negative self-beliefs	Listening and believing	0.30	0.05	43.73	0.24	<0.001
Listening and believing	Negative self-beliefs	0.80	0.12			<0.001
Boredom	Listening and believing	0.47	0.10	21.64	0.13	<0.001
Listening and believing	Boredom	0.29	0.06			<0.001

[a] All variables transformed by log10, with 1 added to the variable to retain variables that are zero. This allows a comparison of the size of the pathways. [b]The size of F and R^2 are the same for both directional pathways.

Mediation models

The Pearson's correlation matrix including all potential predictors (positive and negative beliefs about self, insomnia, nightmare severity, social connection, and boredom), potential mediators (LB-R subscales), and the outcome (LB-A) (Table 3) indicated that no items met criteria for multicollinearity (all r<0.80).

Table 5. Appraisals about being worn down as a mediator of the relationship between insomnia, negative self-beliefs and boredom (predictors) and listening to and believing DTVs (outcome).

	Predictor	Outcome		β[a]	SE	p	Proportion of the total effect explained (%)
			Hypothesised pathways				
Model 1	Insomnia	Listening and believing	Direct effect	-0.13	0.04	<0.001	48.9
			Indirect effect via worn down	-0.14	0.04	<0.001	51.1
Model 2	Negative self-beliefs	Listening and believing	Direct effect	0.12	0.05	<0.01	41.5
			Indirect effect via worn down	0.18	0.04	<0.001	58.5
Model 3	Boredom	Listening and believing	Direct effect	0.14	0.11	0.19	30.0
			Indirect effect via worn down	0.33	0.09	<0.001	70.0
			Oppositional pathways				
Model 4	Listening and believing	Insomnia	Direct effect	-0.52	0.15	<0.001	86.4
			Indirect effect via worn down	-0.08	0.11	0.45	13.6
Model 5	Listening and believing	Negative self-beliefs	Direct effect	0.51	0.18	<0.01	63.7
			Indirect effect via worn down	0.29	0.15	0.05	36.3
Model 6	Listening and believing	Boredom	Direct effect	0.14	0.10	0.17	50.2
			Indirect effect via worn down	0.14	0.09	0.09	49.5

[a] The variables were log-transformed prior to running the model.

Insomnia

In support of the hypothesis, the relationship between insomnia and listening to and believing DTVs was partially mediated by being too worn down to resist the experience. The direct relationship remained significant indicating that there are additional mechanisms other than feeling worn down. Worn down was not a significant mediator of the oppositional pathway from listening to and believing DTVs to insomnia.

Negative self-beliefs

The pathway from negative self-beliefs to listening to and believing DTVs was significantly mediated by being too worn down to resist the experience. The direct relationship remained significant too, indicating that there may be other potential mechanisms linking the two constructs. Worn down fell just short of being a statistically significant (p=.05) mediator of the oppositional pathway from listening to and believing DTVs and negative self-beliefs.

Boredom

The relationship between boredom and listening to and believing DTVs was fully mediated by being too worn down to resist the experience. The direct relationship between boredom and listening to and believing DTVs fell short of significance. The indirect route from boredom to listening to and believing DTVs explained 70.0% of the variance, hence around a third of the variance is left unexplained. Worn down was not a significant mediator of the oppositional pathway from listening to and believing DTVs and boredom.

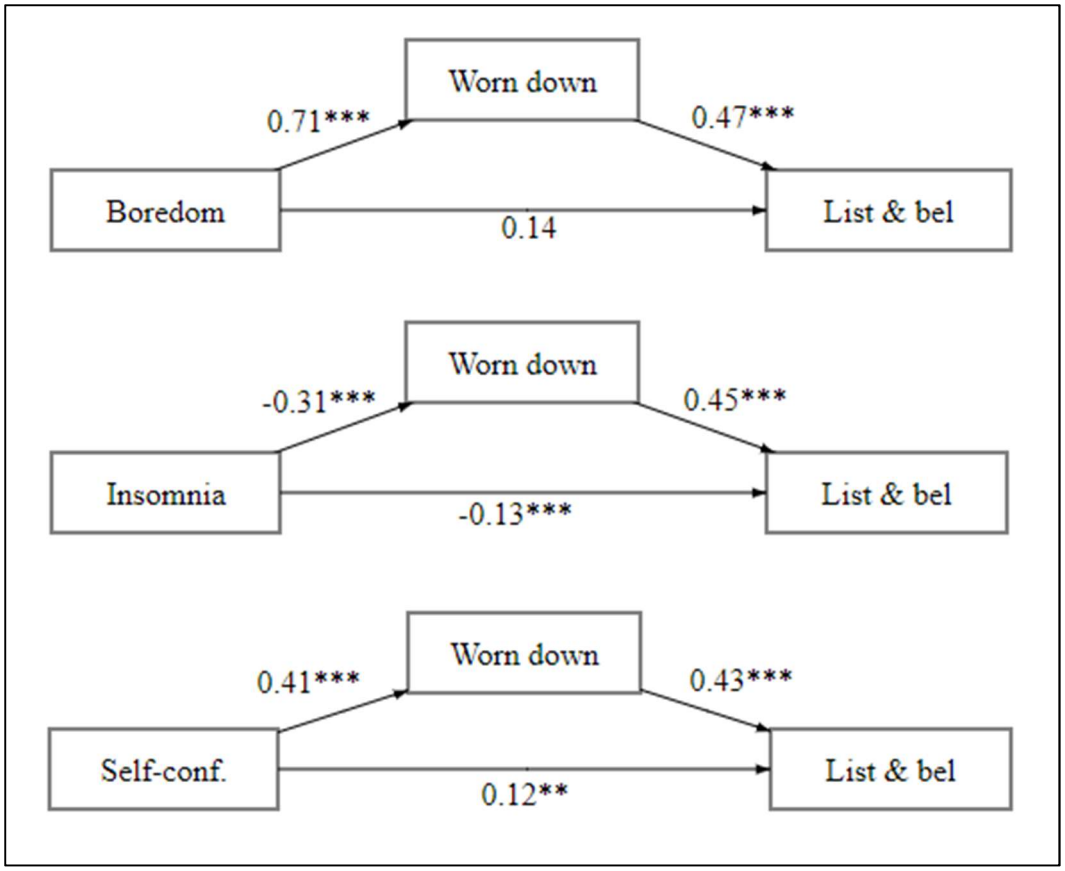


Figure 1. Mediation models for the hypothesised pathways.

Self-conf. = BCSS assessed negative beliefs about self. Worn down=being so worn down it is difficult to resist the voice experience. List & bel = listening to and believing DTVs Unstandardised beta coefficients of log-transformed variables are reported alongside the following *p*-value cut-offs of $p<0.01$**, $p<0.001$***.

Discussion

This study was an exploratory investigation of psychological variables that might contribute to appraisals about listening to and believing DTVs. Three common problems which could be amenable to psychological interventions were identified: boredom, insomnia, and low self-confidence. Half of the patient group reported spending much of their time sitting around doing nothing, which is a precursor to boredom. Two-thirds of the group screened positive for insomnia and two-thirds had strongly held negative self-beliefs (low self-confidence). Insomnia, low self-confidence, and boredom were each associated with emotional distress. They are therefore common presenting problems that could benefit from clinical interventions. As well as being distressing in themselves, insomnia, boredom and low self-confidence were each associated with listening to and believing DTVs, mediated by appraisals about being too worn down to resist the voice hearing experience. Oppositional pathways were explored: being worn down was not a mediator of the pathways from

listening to and believing DTVs to insomnia, low self-confidence, or boredom. Whilst this is an exploratory investigation using cross-sectional data, and directional pathways, therefore, require very cautious interpretation, the results are consistent with the view that insomnia, low self-confidence, and boredom are precursors to being too worn down to resist the DTVs.

Assessment of both directional pathways provided the opportunity to identify individual potential bidirectional cycles between insomnia, negative self-beliefs, and boredom on the one hand and listening to and believing DTVs on the other. Whilst the data are cross-sectional, they provide initial tentative support for individual bidirectional relationships between insomnia, negative self-beliefs, and boredom on the one hand and listening to and believing DTVs on the other. The two largest beta coefficients across the six pathways tested were from listening to and believing DTVs to negative self-beliefs (β=0.80), and from listening to and believing DTVs to insomnia (β=-0.60). This supports some of the qualitative accounts of the effects of listening to and believing DTVs (Chapter Two) which suggest negative effects on self-confidence ("*Ain't got a lot of self-esteem sort of thing. [..]since I started hearing [the voices] [..]",* V13) and sleep ("*oh gosh it was so horrible, I didn't sleep, [..the voices] talked a lot"*, V4).

Social connection and nightmare severity were problems that were significantly associated with listening to and believing DTVs, albeit to a lesser degree than low self-confidence, boredom, and insomnia. Their occurrence however is noteworthy. A significant minority of patients in this study who heard DTVs lacked social connection, for example, 15.3% of the group had not talked to any family or friends about their voice hearing. This means that this sub-group had very limited social support for voice hearing, and reduced opportunities to check out the veracity of threats and criticisms made by voices with other people. Two-thirds of the participant group reported experiencing weekly nightmares, which were rated on average as being moderate to severe. In two-thirds of cases the content of nightmares was related to voice content, for example, nightmares about being harmed if the voices say the patient is going to be harmed. This study is in line with other research indicating that around half to two-thirds of patients with psychotic symptoms experience problematic nightmares (Reeve, Sheaves, et al., 2018; Sheaves et al., 2015).

There are substantial limitations to the current study. First, the cross-sectional design means that the directional pathways are only possible to analyse in an exploratory way, and cannot be determined with any certainty. Second, the study presented here tested three specific potential routes (insomnia, low self-confidence, and boredom) to being worn down, which in turn could result in listening to and

believing DTVs. Whilst worn down was particularly predictive of passive listening and believing DTVs, other appraisal types also predict listening and believing and there will be other unmeasured contributors to these other appraisals. For example, paranoia could plausibly contribute to the appraisal group 'I listen to understand the voices to deal with the threat' but was not measured. Studies are needed that are large enough to study multiple groups of reasons for listening to and believing DTVs and multiple potential factors that could lead to these appraisals.

The third limitation is that the sample size limited the statistical power, and therefore insomnia, negative self-beliefs, and boredom were modelled separately. However, the results indicate that insomnia, negative self-beliefs, and boredom are related and therefore share variance. This finding is supported by the LEAP who agreed that these are potentially related states that tend to co-occur. They resonated with the experience of feeling low in confidence, without a sense of purpose, being inactive during the day and awake at night. Therefore an issue arises as to whether it is appropriate to treat insomnia, boredom, and negative self-beliefs as separate constructs. The fourth limitation is that other potential unmeasured confounds could affect the reported relationships. For example, a greater tendency for distractibility is associated with boredom (Todman, 2003) and could also plausibly lead to greater listening to voices. Life stressors, unrelated to voice hearing, can lead to sleep problems (Riemann et al., 2022), and could also plausibly contribute to the perception that one is worn down.

The fifth limitation is that the size of some associations might be affected by using very brief measures. Voice distress was assessed using one question from the PSYRATS (Haddock et al., 1999), and nightmare severity was assessed using a two-item measure. The size of these associations should therefore be interpreted cautiously. Lastly, the COVID-19 pandemic may have affected the prevalence data reported within the study. Whilst UK-wide lockdowns had ended before the start of recruitment, social distancing guidelines (e.g. allowing only six people to meet at one time) were in place for part of the recruitment window. Rates of boredom in particular may be inflated by the social distancing guidelines. There are not yet replication studies of the prevalence of boredom in voice hearers, however, rates of insomnia and low self-confidence were similar in a separate study of voice hearers which was conducted before the pandemic (Freeman et al., 2019).

Future work should address the issue of shared variance between insomnia, negative self-beliefs, and boredom. A factor analysis of the items which make up these scales, using a larger number of observations, could be carried out. The results could determine how best to model negative self-

beliefs, boredom, and insomnia as predictors of listening to and believing DTVs. They may indeed form three separate psychological constructs that should be modelled as separate predictors that are entered into one model to predict listening to and believing DTVs. This would provide the opportunity to identify the most important predictor(s), whilst accounting for shared variance. Alternatively, the factor analysis may determine that negative self-beliefs, insomnia, and boredom are made up of fewer latent variables which should be entered as predictors of listening and believing. This type of large observational study could be conducted as part of a longitudinal investigation, which would be better placed to test the directional hypothesis that insomnia, low self-confidence, and boredom lead to later listening to and believing DTVs, mediated by appraisals about being worn down. If the hypothesis is shown to be true, causal interventionist tests (Kendler & Campbell, 2009) – the highest grade of evidence for establishing the direction of relationships – would be indicated.

The clearest clinical implication of the study stems from the finding that insomnia, low self-confidence, and boredom are common problems that are associated with distress for patients experiencing DTVs. Therefore irrespective of their potential relationship with listening to and believing DTVs, clinical interventions are indicated that target these three problems for people experiencing negative voices. Cognitive behavioural treatments exist for the treatment of insomnia and nightmares for people with co-occurring voices (Freeman, Waite, et al., 2015; Sheaves et al., 2019), although patients in secondary mental health services rarely receive sleep treatments (Reeve, Sheaves, et al., 2018; Rehman et al., 2016). The high prevalence of sleep disorders in this group with DTVs, coupled with the existence of evidence-based treatments, adds weight to the view that sleep should be routinely assessed in psychosis services (Freeman et al., 2020). Two existing interventions target self-confidence for people with psychosis (Freeman et al., 2014; Hazell et al., 2018) and could be adapted for people hearing DTVs specifically. Lastly, a psychological intervention has been shown to significantly increase structured activity for patients with early psychosis (Fowler et al., 2018). A remaining challenge is which of these treatments should be given the highest priority in mental health services, and how they might be integrated both with each other, and with other treatments that directly target psychotic symptoms.

The next and final chapter synthesises the results from all of the studies making up this thesis, and outlines the key priorities for future investigation, based on this research programme.

6

Discussion

'it's a scary, scary, scary, scary situation [hearing threatening voices]. I've had more fear in the last two years [pause] than anywhere in my life'

-a qualitative interview participant from Chapter Two.

Many patients continue to be distressed by voice hearing, despite receiving medication and CBT for psychosis. It is widely accepted that power and omnipotence appraisals are related to voice distress, but cross-sectionally they each account for only a minority of the variance in voice distress (Tsang et al., 2021). The majority of variance is therefore left unexplained. It was set out in this thesis to identify new appraisals that could plausibly contribute to understanding the occurrence of voice distress. Learning from the development of efficacious cognitive therapy for harmful compliance with commanding voices, the programme of research focused on one specific and common presentation of voices – DTVs. The first two steps of the Oxford Approach to the development of psychological therapies were carried out: conducting clinical interviews to understand the core cognitive processes associated with the presenting problem; and developing a theoretical account to explain why the presenting problem does not self-correct (a maintenance model). In this chapter an overview of the thesis findings is presented, clinical implications are discussed, limitations are described, and future directions for research are outlined.

Overview of findings from the thesis

The programme of work set out to understand a common clinical paradox for patients who hear DTVs: they typically know that their voices intend to upset them, and yet they often listen to and believe the negative comments that they hear. The first objective of the thesis was to learn from patients about the reasons why they listen to and believe DTVs, in order to identify cognitive appraisals which could be targeted in psychological therapy.

The patient accounts were consistent with the view that listening to and believing DTVs is an important outcome that contributes to distress. All patients described suicidal thoughts or self-harm, and depression, anxiety, anger, and social isolation were commonly reported. Reasons for listening to

and believing DTVs were readily identified by patients during the qualitative interviews. A grounded theory methodology identified six higher order categories of appraisals, which included 21 individual reasons for listening to and believing DTVs. The first group of reasons related to a desire to understand and make sense of the unusual and distressing experience of hearing DTVs. This included wanting to identify the identity, location, and motive of the voice, as well as making sense of why they heard voices that other people could not. Second, a common starting point in many patient accounts were descriptions of how real the voices sound, and that a normal instinct was to listen to and believe voices that we hear in day-to-day life. As V2 described: *'They were convincing because they were as audible as you are now and that's all you need'* (V2). Several patients described building up accumulating evidence over time that allowed them to go against this instinct and question the veracity of the threats and criticisms. The third group of reasons involved being alert to the threat, and ways to deal with it. This included listening to negotiate or fight the voices, and listening or believing because this enabled the patient to be prepared for what might happen, and make an escape plan. Fourth, being worn down allowed threats and criticisms from DTVs to take hold. This comprised mental defeat and lacking the perceived energy, social support, and confidence to question the voices. Fifth, the identity of the voice was important if it sounded like someone known to the person, because the patient was used to listening to that person. Lastly, the DTVs used a range of strategies to capture attention including shouting, screaming, making sinister noises, or other calculated tactics. The first objective of the thesis was to identify reasons why patients listen to and believe DTVs, and has therefore been met. Listening and believing is a logical and understandable response to the experience of hearing threats and criticisms from voices.

The systematic review in Chapter Three revealed that there were no existing measures of listening to and believing DTVs, or the reasons for listening and believing, to allow a quantitative test of the psychological framework. Given that precision in measurement and treatment targets has proven a key ingredient in the development of successful psychological therapies, the second objective of the thesis was to develop two measures: listening to and believing DTVs and the cognitions (reasons) underpinning listening and believing. Half of the patients endorsed a high degree of listening to or believing DTVs. Listening and believing comprised four factors: active listening (purposefully tuning into DTVs), passive listening (listening to DTVs without a sense of control), and believing DTV content, and disregarding DTVs (by tuning them out and disregarding DTV content). The psychometric properties for the listening to and believing DTVs assessment scale were good. There were seven groups of reasons for listening to and believing DTVs. These were: i) to better understand the voices to deal with the threat; ii) being so worn down it was difficult to resist the voice experience; iii)

listening to learn something insightful; iv) voices using strategies that capture attention; v) voices were just like real people; vi) having been alone with time and space to listen; and vii) the voices are of people I know. Psychometric properties of the listening to and believing DTVs reasons scale were good. Development of the Listening and Believing – Assessment, and Listening and Believing - Reasons scales have therefore fulfilled the second objective of the thesis: to develop psychometric scales of key constructs in the cognitive framework.

The third and fourth objectives of the thesis were to assess relationships between key constructs in the cognitive framework. Specifically, they set out to test whether listening to and believing DTVs is associated with greater distress and whether the reasons for listening to and believing DTVs are associated with greater listening to and believing DTVs. Higher levels of believing, active listening, and particularly passive listening were each individually associated with higher levels of anxiety, depression, and voice distress. Passive listening explained approximately a quarter of the variance in depression and anxiety, and believing DTVs explained approximately a fifth of the variance observed. Each of the seven groups of reasons individually predicted listening to or believing DTVs. Regressing listening and believing onto the seven groups of reasons in a structural equation model explained 70% of the variance in passive listening and around half of the variance in believing and active listening. The factor 'being so worn down it is difficult to resist the experience' was particularly predictive of passive listening to and believing DTVs. The third and fourth thesis objectives have therefore been met.

The final objective of the thesis, covered in Chapters Four and Five, was to develop an initial understanding of factors other than appraisals that lead to greater listening to and believing DTVs. Social isolation was commonly reported in the patient interviews, and being alone with time and space to listen was associated with listening to and believing DTVs. Chapter Four revisited the qualitative interviews to conduct a secondary analysis focusing on the problem of being around people when hearing DTVs. The results highlighted that disengaging from social contact is a common response to hearing voices. A sub-group of the patient accounts in Chapter Four described talking about their experiences with other people as a key turning point in their recovery journey: *'the best thing I ever did was talk about it, but then the worst thing I did was when I was 16, I didn't tell anyone. And then I ended up like having a complete breakdown'* (V7). Yet there were ten reasons why connecting with other people was challenging, including difficulties concentrating, fear of exacerbation of voices, fear of stigma, and a lack of understanding from people who do not hear voices. At a societal level, more work is required to correct common misconceptions about voice

hearing as a means of tackling stigma. Resources that enable people who hear voices to find a way to talk about their experiences with loved ones may increase opportunities for support and foster greater understanding. Given that being alone with time and space to listen to the DTVs was associated with greater listening and believing (Chapter Three), the intriguing possibility is that social connection could be one vehicle for reducing listening to and believing DTVs. This requires testing.

Chapter five was an exploratory study to identify psychological variables that potentially contribute to the appraisals about listening to and believing DTVs. Boredom, insomnia, nightmares, and very strongly held negative self-beliefs were all endorsed by at least two-thirds of the participant group experiencing DTVs. An exploratory analysis of directional pathways using cross-sectional data indicated significant bidirectional associations individually between insomnia, boredom, and negative self-beliefs, and listening to and believing DTVs. Appraisals about being worn down mediated the individual associations between boredom, insomnia, and negative self-beliefs and listening to and believing DTVs. Chapters Four and Five fulfil the final thesis objective of developing an initial understanding of factors other than cognitions that could contribute to listening to and believing DTVs. The results are consistent with the hypothesis that boredom, insomnia, and negative self-beliefs contribute to appraisals about being worn down. It should be recognised, however, that this was exploratory work and further examination of the variables identified (boredom, insomnia, and negative self-beliefs), and also other unmeasured factors, is clearly required.

A strength of the research programme was the close collaboration with a LEAP. This shaped the research in several important ways. Detailed changes were made in the research, for example, the LEAP collaborated with the DPhil candidate in labelling the higher order categories in the grounded theory (Chapter Two), provided questions for the item pools for the new assessments, and the LEAP chose the term ‘nasty voices’ to refer to DTVs on the new questionnaire measures (Chapter Three and Appendices C-G). The LEAP also made more substantive contributions to the direction of the research programme. For example, the secondary analysis of the qualitative interviews to investigate social connection and its relation to voice hearing (Chapter four), and the inclusion of a measure of social connection in the quantitative study (Chapter five) was prompted by discussions with the LEAP when analysing data in Chapter Two. This input, alongside the patient interviews (Chapters Two and Four), has been crucial to ensuring that the development of the framework, and the direction for the research reflects the lived experience and priorities of voice hearers.

Clinical implications

Development of a translational treatment for listening to and believing DTVs

The framework developed within the thesis of reasons for listening to and believing DTVs provides the necessary foundations for the development of a translational treatment. Given that listening to and believing DTVs was associated with distress, developing a psychological treatment that reduces listening to and believing DTVs, by targeting the cognitive mechanisms (the reasons for listening to and believing DTVs), is the clear next step. A full programme of work evaluating the translation from theory to therapy is required. Within this section, an overview of how the thesis contributes to the development and testing of such a psychological intervention is outlined.

Two psychometrically robust outcome measures were developed in the thesis: Listening and Believing – Assessment, and Listening and Believing – Reasons (Chapter Three). The study which validated the two assessments recruited one of the largest participant groups for the psychometric assessment of a voice hearing outcome measure. The participants were recruited from all geographic areas of England, covered a broad age range, and the ethnicity of the group was broadly representative of the population of England. These scales provide the capability to reliably measure the outcome of a psychological therapy (Listening and Believing – Assessment), and the mechanisms which would be targeted in treatment (Listening and Believing – Reasons) in a precise way.

The clinical aim of a translational psychological treatment, based on the cognitive framework, is for patients who hear DTVs to disregard the threats and criticisms that they hear, rather than tuning into them and believing the comments to be true. Appraisals about being worn down were identified within Chapter Three as a priority for treatment development, given that they were particularly predictive of both believing DTVs, and passively listening to them. Two important components of the 'worn down' construct are confidence in relation to voices and mental defeat. Cognitive approaches that enable patients to trust their own beliefs rather than believing voices could include developing with the patient a list of criteria of 'someone who makes reliable judgements' followed by an assessment of whether they and the voices match these criteria. The goal of this cognitive restructuring would be to enable the patient to learn that they can make more reliable judgements than DTVs and hence can trust their own mind rather than the voice's perspective. Taking the construct of mental defeat, Ehlers and colleagues propose that the opposing cognition to defeat is mental planning (coping) (Ehlers et al., 1998). Hence boosting self-efficacy via specific management plans for times of vulnerability to voices may be one route to reducing defeat cognitions. Given that

boredom was associated with being worn down, and listening to and believing DTVs, making specific plans for how the patient could use their time might be one practical route to increasing autonomy over whether or not voices are listened to.

Appraisals concerning being worn down have been shown to be a particular treatment priority from the structural equation model in Chapter Three. However, the data in that chapter also support the view that any of the seven groups of appraisals could viably be targeted, given that all were associated in the individual regressions with listening to and believing DTVs. This offers a greater degree of clinical flexibility and patient choice in terms of treatment targets. For example, targeting cognitions about being worn down might be the priority for some patients to reduce passive listening, but being alone with time and space to listen to DTVs also accounted for 42% of the variance in passive listening and could be an alternative clinical target (albeit being highly related to being worn down). Manipulation studies could identify which of the seven groups of cognitions when manipulated, bring about the largest reductions in listening to and believing DTVs in order to further refine the psychological framework. However at this stage in the development of the framework, without evidence from causal interventionist tests, it is a clinical advantage to have the option of seven targets for therapy that have the potential to lessen listening to and believing DTVs.

Close collaboration between lived experience and clinical academic expertise is crucial for the development and testing of the psychological intervention. This will ensure that treatment techniques are selected for their potential to be both feasible and acceptable to patients, and for their potential capacity to impact appraisals that predict listening to and believing DTVs. It is also anticipated that the challenges of social connection when hearing DTVs, identified in Chapter Four, have the potential to affect a therapeutic relationship. For example, therapy uptake could be affected by the perception that a therapist who does not hear voices has a limited understanding of the challenges faced by people who hear DTVs. Information shared by patients within a treatment session could be more limited because DTVs reduce the patient's ability to trust a therapist, and because they fear negative consequences from voices after the session if they speak to the therapist about the DTVs. Lastly, the session itself may require adapting if the concentration required to engage with the therapist is hard or tiring, or if voices mimic the voice of the therapist. Working alongside a LEAP with experience of hearing DTVs would provide the opportunity to consider how to adapt treatment sessions to minimise the effects of these challenges.

Social connection and voice hearing: an animation.

In Chapter Four social connection was described as a key part of the recovery journey for some patients who heard DTVs: *"the more I could open up, the more I let my mates know, the more everything has settled down really"* (V5). Yet there were key challenges to social connection, faced by voice hearers. An animation was therefore developed to share the themes that were identified in Chapter Four. The aims were to i) normalise the key challenges faced by voice hearers when being around people, ii. inspire new strategies that allow voice hearers to foster greater social connection, iii) aid greater understanding of the experience of hearing DTVs in the social network of voice hearers (by providing a resource that enables more open dialogue about the experience); and iv) develop a resource that accurately shares the lived experience of voice hearing in order to aid greater understanding about the experience among the general public. A research participant, who advised on the animation, generated the title: 'Coping with Voices: Being with People' (https://www.youtube.com/watch?v=C8ndR1Umj5A).

.



Figure 2: Animation still - 'Many voice hearers want to be around other people, but find it difficult for many reasons'.

A team of lived experience experts, clinical academics specialising in psychosis, animators, scriptwriters, voice actors, and the University of Oxford's digital engagement platform for sciences (Oxford Sparks) collaborated to create the animation. The process involved writing a brief for the animation team, developing a script and storyboard, recording the voiceover, developing the animatics, and finally the full animation. Lived experience consultation was embedded in every step in the process to ensure that the animation resonated with the experience of people who hear voices.

This included, for example, the appropriateness of the phrasing used in the script, the style and colours of speech bubbles for the voices (see Figure 2), the imagery depicting talking about voices to people (see Figure 3), and choosing the voice actors from a shortlist. It also ensured that the tone of the animation was well balanced: light enough to be engaging to a broad audience, but also accurately depicting the distressing experience of hearing DTVs. A communications plan, devised in collaboration with Oxford Sparks and the Communications Manager for the Department of Psychiatry, University of Oxford ensured that the animation was highlighted to a broad audience. A social media campaign launched the animation in October 2020 on the day of the publication of the results (Sheaves et al., 2021).

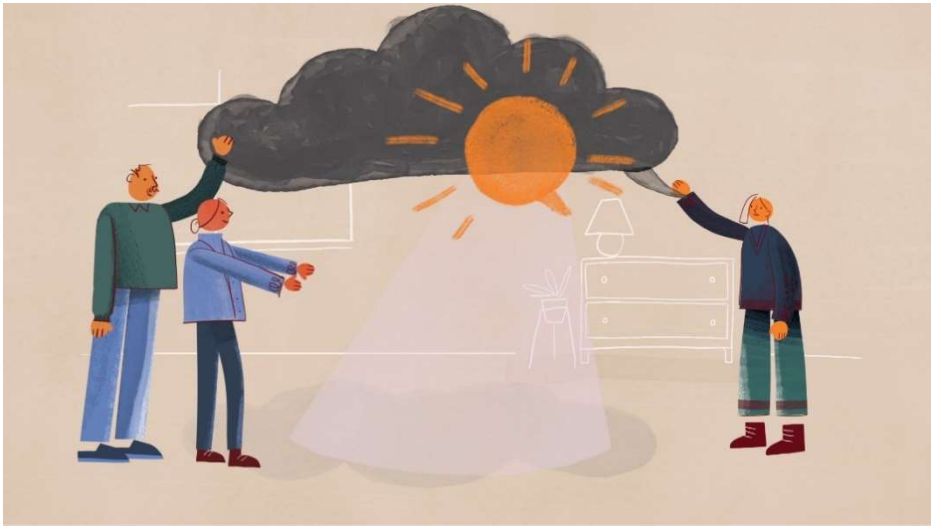


Figure 3: Animation still - 'And I've found my own way of telling people that I'm having difficulties'.

Metrics from social media channels show that by April 2022 the animation had been viewed over 27,000 times. The viewers were an international audience spanning Europe, the Americas, Australia and Asia. The age range spanned 13 to 65+ years, with 62% identifying as male and 38% female. The animation has been used in training for clinical psychologists and is embedded into an informational website for voice hearers (https://understandingvoices.com/living-with-voices/talking-about-voices/). Qualitative feedback from the LEAP indicated that the animation had the potential to inspire new strategies to enable social connection: *"it might inspire new ways to cope with voices. I liked the section about meeting up with other people who hear voices. For me, I thought I was the only one, but talking to other voice hearers was like a light bulb moment where I realised 'I'm not alone'".* The LEAP also considered that the animation was a useful platform for initiating conversations about voice hearing: *"I've shown my housemate. It explains the difficulties I have and helps him to understand".* Lastly, it was viewed as a resource that may aid greater understanding among the wider public: *"the animation is a softer way to get information shared about what it's like to hear voices. It's accessible,*

and more so than a long written report. It could really change people's perceptions of voices, particularly in communities where voice hearing is misunderstood".

Future research directions

The thesis research has developed a translational psychological theory. The clinical goal is to lessen the degree of listening to and believing DTVs. The appraisals are the hypothesised mechanisms to target to bring about change in the clinical outcome, and these can be targeted using cognitive behavioural therapy. The priority for subsequent research is to begin the process of developing and assessing the intervention in accordance with the Medical Research Council (MRC) guidelines for developing complex interventions (Campbell et al., 2000; Skivington et al., 2021). This requires a full programme of research that will develop the treatment, assess the feasibility and acceptability of the treatment, and the feasibility of collecting adequate outcome data. This data, alongside initial efficacy data for listening to and believing DTVs and the hypothesised mechanisms for the treatment would inform the design of a randomised controlled trial. A case series would be a suitable design for this early-phase translational work. Whilst evaluation of efficacy signals is very limited by the lack of a control group, multiple baseline designs that take an average baseline assessment score (Freeman, Bradley, Waite, et al., 2016), or randomly allocate participants to different baseline lengths (Steel et al., 2019) allow a better estimation of the mean score for the outcome, and the within-participant variation, before delivering the intervention (Barnett et al., 2005). Qualitative feedback from participants and client satisfaction measures can assess the acceptability of the intervention. Qualitative feedback might also identify new hypotheses about moderators of treatment response, which could subsequently be measured in a controlled trial and hence answer calls for greater attention to the effects of moderators in evaluating complex interventions (Skivington et al., 2021).

There is also further theoretical work to be done in understanding the cognitive appraisals that contribute to distress. Meta-analysis shows that a range of appraisals have been cross-sectionally associated with voice distress including malevolence, power or dominance appraisals, loss of control, and voice intrusiveness (Tsang et al., 2021). These appraisals do not act in isolation, for example, the perception that voices relate in a dominant and intrusive style is significantly related to appraisals that voices have a malevolent intent (r=0.87) and are powerful (r=0.59) (Hayward et al., 2008b). And a re-analysis of the items making up the original omnipotence and malevolence appraisal scales of the BAVQ-R shows that the items are related to such an extent that they form one factor (Strauss et al., 2018), although three omnipotence items were omitted to improve the model fit. The items making up that factor primarily relate to malevolent intent from voices (E.g. '*my voice wants to harm* me', *'my*

voice is trying to corrupt or destroy me') and the ability to do harm (E.g. *'my voice will harm or kill me if I disobey or resist it'*, '*my voice makes me do things I really don't want to do'*). Such threat appraisals are likely related to the listening to and believing framework. For example, a voice perceived as having malevolent intent might be listened to in order to 'better understand the voices to deal with the threat' (the 'understand' sub-scale). Appraisals linked to derogatory voices are less clearly covered by the BAVQ-R appraisal sub-scale, and therefore the reasons for listening to and believing DTVs framework might be more relevant to this voice presentation. Whether it is appropriate to synthesise different voice appraisal frameworks for understanding voice distress is best addressed once it has been determined which voice appraisals are most amenable to cognitive therapy, and which appraisals, once manipulated, bring about the greatest degree of improvement in voice distress.

Methodology that draws on non-clinical populations has accelerated the theoretical understanding of causal factors underpinning psychotic experiences. For example, groups recruited from student and non-clinical groups have allowed sleep to be manipulated in both directions (improved, and worsened) and together these studies have identified that sleep is a causal factor in the occurrence of psychotic experiences (Freeman et al., 2017a; Reeve, Emsley, et al., 2018). The pace of research advances in listening to and believing DTVs may therefore be limited by the fact that so few people in non-clinical groups experience threatening and derogatory voice content. One route to overcoming this is through paradigms that simulate voices for non-clinical participants based on lived experience accounts (Baumeister et al., 2022). These allow greater experimental control over parameters of the voice experience, for example, the content, volume, and timing of its occurrence. These methods could be integrated with randomised controlled experimental studies in non-clinical groups using virtual reality technology (for example see Brown et al., 2020). Virtual reality provides the opportunity to carefully control the environment around the individual, allowing greater precision in the experimental test. This could be used in several ways, for example, derogatory and threatening voice content could be simulated, and the psychological factors identified as potential precursors to the worn-down appraisals (Chapter Five) (e.g. boredom and sleep disruption) could be manipulated to assess whether there is a change in listening to and believing DTVs. Carrying out this test with non-clinical participants would potentially allow quicker recruitment and tightly controlled conditions, though lived experience consultation in the design and conduct of any such experiment would of course be crucial to ensure that the simulation of DTVs mirrors as closely as possible the true voice hearing experience.

An interesting theoretical issue is how the listening to and believing DTVs framework relates to other psychological processes which have been shown to underpin voice hearing. A substantial research effort has highlighted the importance of trauma in the occurrence of psychotic symptoms, including voice hearing. Voice hearers commonly describe traumatic experiences (e.g. bullying and experiences of abuse) as important in the aetiology of the voices (Dudley et al., 2009; Romme & Escher, 1989). And of those with psychosis who have experienced trauma, 58% report either thematic links or direct content links between their voices and their experience of trauma (Hardy et al., 2005). The direct content links from voices can be reflective of fragmented, poorly contextualised memories of past traumatic experiences (Hardy, 2017; Steel et al., 2005). For these patients, the auditory component, and the lack of episodic contextualisation mean that they are experienced as voices rather than an intrusive memory (Hardy, 2017). Post-traumatic emotion regulation difficulties and negative post-traumatic beliefs are additional routes from trauma to voices (Hardy, 2017), and may give rise to thematic links between traumatic experiences and voices (Brand et al., 2021). Post-traumatic reactions may therefore be one pathway to derogatory and threatening voice content. It is also plausible that traumatic experiences could underpin the reasons for listening to and believing DTVs. For example, mental defeat and negative self-beliefs (components of feeling worn down) are common sequelae of traumatic experiences (Freeman et al., 2013; Kleim et al., 2007). Assessing how post-traumatic stress reactions relate to the listening to and believing DTVs framework is an interesting area for future research. Key questions include: i) are peri and post-traumatic psychological processes a pathway to the reasons for listening to and believing DTVs? and ii) could reducing listening to and believing DTVs (through cognitive therapy) affect engagement in, or the treatment response to trauma therapies for people who hear DTVs?

The challenges and opportunities of social connection whilst hearing DTVs, described in Chapter Four, generate several avenues for future research. Further quantitative investigation of the association between social connection and voice hearing outcomes would be worthwhile. Whilst several participants described that their voices lessened in frequency, or were less central in attention when they were around other people, this was not the case for all. Paranoia was described as a specific challenge for being around people, which could exacerbate voices in social settings. Testing the hypothesis that paranoia is a moderator of the association between social connection and both i) listening to and believing DTVs, and ii) voice frequency, would be an interesting line of inquiry. Ecological Momentary Assessment (EMA) methods have been used to assess voice intensity and social context showing that time spent alone tends to result in voice intensity dropping, whilst remaining in a social context is associated with stability in the intensity of voices (Delespaul et al., 2002). EMA

could be a suitable method for assessing paranoia as a potential moderator of the relationship between social connection and both voice occurrence and listening to and believing DTVs.

Limitations

The central limitation affecting the strength of conclusions that can be drawn from the thesis is the qualitative and cross-sectional designs that were employed. The theoretical perspective is that listening to and believing DTVs causes distress, yet this directional hypothesis was not tested in the thesis. Longitudinal research can indicate the direction of pathways, but causal interventionist tests provide the most convincing evidence for a directional relationship (Kendler & Campbell, 2009).

The second limitation is that the listening to and believing DTV subscales each accounted for only a minority of the variance in emotional distress in the patient group. Passive listening accounted for a quarter of the variance in depression and anxiety, believing accounted for a fifth of the variance and active listening accounted for a tenth of the variance in depression and 16% of the variance in anxiety. It is not clear whether this variance is shared with omnipotence and malevolence, which also explained only a minority of variance in distress, or is an additional unique variance. It is possible that listening to and believing DTVs are associated with other unmeasured negative outcomes (e.g. confusion from voices, and paranoid thoughts) but these variables were not measured. Irrespective, further investigation is required to identify other contributors to emotional distress for people hearing DTVs. These could include for example perceptions of the controllability over illness (Birchwood et al., 1993), appraisals linked to the loss of social roles such as employment, cognitions about stigma (Xu et al., 2016), and social isolation. Equally depression and anxiety may be separate co-occurring clinical disorders for people with DTVs and researching psychological processes which maintain these disorders (e.g., negative self-beliefs, worry, and rumination) could be worthwhile in groups who hear DTVs.

The third limitation is that the large quantitative test (Chapter Three) showed that the reasons for listening to and believing DTVs accounted for only 46% of the variance in active listening and 52% of the variance in believing. This is lower than the variance explained in passive listening (70%). Hence it is possible that the full range of reasons for passive listening were more readily elicited during the qualitative interview than reasons for believing and active listening. In interpreting the finding that the reasons for listening to and believing accounted for only half of the variance in believing, it was suggested by the LEAP that the quality of evidence that voices use to back up claims could be an

important contributor to their believability. These may not have been elicited in the qualitative interviews owing to the questions included in the topic guide. For example, *"Do/did you believe what the voices say when you hear them? Why / why not?"* does not specifically invite the participant to share details of the dialogue from voices. An additional follow-up question could be: *"do the voices say anything specific to convince you that what they are saying is true"*. It is also possible that the participants were more reluctant to share direct dialogue from voices. Several participants had concerns about sharing details of voice content, for fear of repercussions from voices after the interview. With regards to active listening to DTVs, this was described less often than passive listening in the qualitative study. Whilst the subsequent quantitative study showed this is reflective of the fact that it is a less common occurrence for people who hear DTVs than passive listening, it is possible that it also provided less opportunity to assess the full range of reasons for active listening. Further investigation with a sub-group of participants who actively listen out for their DTVs might broaden the list of reasons for listening to and believing them.

An additional explanation for the fact that the new appraisal framework did not explain more variance in listening to and believing DTVs lies in differences between the qualitative study (Chapter Two) and the large quantitative test (Chapter Three). The qualitative study recruited participants specifically with non-affective psychosis and from one geographical region of England. The grounded theory was built using data from this group. Whereas the large quantitative test recruited a broad range of mental health diagnoses and was more diverse, particularly with respect to ethnicity. It may be that there are other additional appraisals that underpin listening to and believing DTVs for patients with other diagnoses such as complex PTSD, or depression, and that cultural identification shapes appraisals about listening to and believing DTVs but that these were not elicited in the qualitative interview. Whilst Chapter Three showed that controlling for diagnostic group did not affect the relationships between listening and believing and distress, the sample size did not permit measurement invariance analysis by either diagnosis or ethnicity.

There may be other unmeasured factors that might account for a patient's propensity to listen to voices, beyond cognitive appraisals. For example, set-shifting – the neurocognitive ability to move between different tasks - has been longitudinally associated with psychotic experiences (Knudsen et al., 2022), and could plausibly result in the patient finding it challenging to shift attention away from voices. The LEAP has also suggested that different environments may also be important, for example, one might be more inclined to listen out for a voice's perspective in an unfamiliar environment when the perceptual system is generally more alert to threat (e.g. walking home at night in an unknown

neighbourhood). These unmeasured factors could be investigated in future research to provide a potentially more comprehensive account of the mechanisms associated with listening to and believing DTVs.

The fifth group of limitations relates to the choice of measures used within the quantitative study. First, the assessments relied entirely on self-report assessments. This allowed a large participant group to be recruited in order both to complete the psychometric assessments of the new measures and also allowed enough statistical power to conduct the structural equation model regressing listening and believing factors onto the reasons for listening and believing. However, asking participants to think retrospectively about listening and believing, and the reasons for doing so over the past week could be a source of measurement error. It is possible for example that if someone has a severe problem with listening to and believing DTVs at the time that they complete the assessment that this could affect their retrospective report of listening and believing. Second, whilst one item from the PSYRATS, with five response options, is a common method for assessing voice distress (Tsang et al., 2021), it is likely less sensitive to detect meaningful differences in distress between participants than a dimension scale with more items and response options. This likely affects the analysis using voice distress as an outcome (Chapter Three). The size of these associations is, therefore, given less weight than the validated scales of depression and anxiety.

The final limitation is that the quantitative study (Chapters Three and Five) was conducted during the COVID-19 pandemic. The study was adjusted so that participants could complete the measures online, and hence recruitment continued through the second and third UK lockdowns, which was during recruitment for Part A Chapter Three. Social distancing measures were also in place during Part B recruitment for the quantitative study. Whilst this allowed an adequate sample size to be recruited for the measure development work, it is possible that there were additional contributors to the degree of distress experienced by participants during these times (e.g. COVID-19-related worry, and a lack of meaningful activity). This could have affected the degree of variance in voice distress explained by the listening to and believing DTVs framework. The COVID-19 restrictions are also particularly relevant to the assessment of boredom, insomnia, and negative self-beliefs in which prevalence rates are reported. These prevalence rates, particularly with regards to boredom, could have been affected by social distancing legislation.

Conclusions

Hearing voices frequently within the context of a mental health diagnosis is associated with emotional distress (Woods et al., 2015), stigma and social isolation (Xu et al., 2016), unemployment (Evensen et al., 2016; National Collaborating Centre for Mental Health, 2014), and an elevated risk of suicide (Hor & Taylor, 2010). Theoretically driven and targeted treatments that reduce the distress experienced by voice hearers are therefore a clinical priority. The programme of work presented within this thesis provides the necessary foundations for the development and testing of a cognitive behavioural treatment. A theory has been developed from patient accounts, psychometrically robust outcome measures to assess key constructs in the approach have been developed, and the first empirical test of the reasons for listening to and believing DTVs framework has been carried out. The framework broadens the understanding of voice distress and provides new targets for cognitive therapy. The clear next step is to translate the theory into treatment, working alongside lived experience expertise, and begin the steps of testing its efficacy.

7

References

American Psychiatric Association. (2013). *The Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). American Psychiatric Association.

Andrew, E. M., Gray, N. S., & Snowden, R. J. (2008). The relationship between trauma and beliefs about hearing voices: A study of psychiatric and non-psychiatric voice hearers. *Psychological Medicine*, *38*(10), 1409–1417. https://doi.org/10.1017/S003329170700253X

Baethge, C., Baldessarini, R. J., Freudenthal, K., Streeruwitz, A., Bauer, M., & Bschor, T. (2005). Hallucinations in bipolar disorder: Characteristics and comparison to unipolar depression and schizophrenia. *Bipolar Disorders*, *7*(2), 136–145. https://doi.org/10.1111/j.1399-5618.2004.00175.x

Barnett, A. G., van der Pols, J. C., & Dobson, A. J. (2005). Regression to the mean: What it is and how to deal with it. *International Journal of Epidemiology*, *34*(1), 215–220. https://doi.org/10.1093/ije/dyh299

Baron, R. M., & Kenny, D. A. (1986). The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182.

Bartels-Velthuis, A. A., Jenner, J. A., van de Willige, G., van Os, J., & Wiersma, D. (2010). Prevalence and correlates of auditory vocal hallucinations in middle childhood. *British Journal of Psychiatry*, *196*(1), 41–46. https://doi.org/10.1192/bjp.bp.109.065953

Bartels-Velthuis, A. A., van de Willige, G., Jenner, J. A., & Wiersma, D. (2012). Consistency and reliability of the auditory vocal hallucination rating scale (AVHRS). *Epidemiology and Psychiatric Sciences*, *21*(3), 305–310. https://doi.org/10.1017/S2045796012000108

Bastien, C. H., Vallières, A., & Morin, C. M. (2001). Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Medicine*, *2*(4), 297–307. http://www.ncbi.nlm.nih.gov/pubmed/11438246

Baumeister, D., Peters, E., Pruessner, J., Howes, O., & Chadwick, P. (2022). The effects of voice content on stress reactivity: A simulation paradigm of auditory verbal hallucinations. *Schizophrenia Research*, *epub ahead*. https://doi.org/10.1016/j.schres.2019.07.019

Behrendt, S. (2014). *lm.beta: Add Standardized Regression Coefficients to lm-Objects* (1.5-1). https://cran.r-project.org/package=lm.beta

Bentall, R. P. (1990). The Illusion of Reality: A Review and Integration of Psychological Research on Hallucinations. *Psychological Bulletin*, *107*(1), 82–95.

Bentall, R. P., Baker, G. A., & Havers, S. (1991). Reality monitoring and psychotic hallucinations. *British Journal of Clinical Psychology*, *30*(3), 213–222. https://doi.org/10.1111/j.2044-8260.1991.tb00939.x

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*(2), 238–246. https://doi.org/10.1037/0033-2909.107.2.238

Birchwood, M., & Chadwick, P. (1997). The omnipotence of voices: Testing the validity of a cognitive model. *Psychological Medicine*, *27*, 1345–1353. https://doi.org/10.1017/S0033291797005552

Birchwood, M., Dunn, G., Meaden, A., Tarrier, N., Lewis, S., Wykes, T., Davies, L., Michail, M., & Peters, E. (2018). The COMMAND trial of cognitive therapy to prevent harmful compliance with command hallucinations: predictors of outcome and mediators of change. *Psychological Medicine*, *48*(12), 1966–1974. https://doi.org/10.1017/S0033291717003488

Birchwood, M., Gilbert, P., Gilbert, J., Trower, P., Meaden, A., Hay, J., Murray, E., & 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. https://doi.org/10.1017/S0033291704002636

Birchwood, M., Mason, R., Macmillan, F., & Healy, J. (1993). Depression, demoralization and control over psychotic illness a comparison of depressed and non-depressed patients with a chronic psychosis. *Psychological Medicine*, *23*(2), 387–395. https://doi.org/10.1017/S0033291700028488

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), 337–334.

Birchwood, M., Michail, M., Meaden, A., Tarrier, N., Lewis, S., Wykes, T., Davies, L., Dunn, G., & Peters, E. (2014). Cognitive behaviour therapy to prevent harmful compliance with command hallucinations (COMMAND): a randomised controlled trial. *The Lancet Psychiatry*, *1*, 23–33. https://doi.org/10.1016/S2215-0366(14)70247-0

Bloomfield, M. A. P., Chang, T., Woodl, M. J., Lyons, L. M., Cheng, Z., Bauer-Staeb, C., Hobbs, C., Bracke, S., Kennerley, H., Isham, L., Brewin, C., Billings, J., Greene, T., & Lewis, G. (2021). Psychological processes mediating the association between developmental trauma and specific psychotic symptoms in adults: a systematic review and meta-analysis. *World Psychiatry*, *20*, 107–123.

Bogen-Johnston, L., de Visser, R., Strauss, C., Berry, K., & Hayward, M. (2017). "That little doorway where I could suddenly start shouting out": Barriers and enablers to the disclosure of distressing voices. *Journal of Health Psychology*, *March 2018*. https://doi.org/10.1177/1359105317745965

Brand, R. M., Bendall, S., Hardy, A., Rossell, S. L., & Thomas, N. (2021). Trauma-focused imaginal exposure for auditory hallucinations: A case series. *Psychology and Psychotherapy: Theory, Research and Practice*, *94*(S2), 408–425. https://doi.org/10.1111/papt.12284

Brown, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Sage.

Brown, P., Waite, F., Rovira, A., Nickless, A., & Freeman, D. (2020). Virtual reality clinical-experimental tests of compassion treatment techniques to reduce paranoia. *Scientific Reports*, *10*(1), 8547. https://doi.org/10.1038/s41598-020-64957-7

Campbell, M., Fitzpatrick, R., Haines, A., Kinmonth, A. L., Sandercock, P., Spiegelhalter, D., & Tyrer, P. (2000). Framework for design and evaluation of complex interventions to improve health. In *British Medical Journal* (Vol. 321, Issue 7262, pp. 694–696). BMJ Publishing Group. https://doi.org/10.1136/bmj.321.7262.694

Cavelti, M., Thompson, K., Hulbert, C., Betts, J., Jackson, H., Francey, S., & Chanen, A. (2019). Preliminary evidence for the cognitive model of auditory verbal hallucinations in youth with borderline personality disorder. *Frontiers in Psychiatry*, *10*(MAY), 1–11. https://doi.org/10.3389/fpsyt.2019.00292

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

Chadwick, P., & Birchwood, M. (1995). The omnipotence of voices. II: The Beliefs About Voices Questionnaire (BAVQ). *British Journal of Psychiatry*, *166*, 773–776. https://doi.org/10.1192/bjp.166.6.773

Chadwick, P., Lees, S., & Birchwood, M. (2000). The revised beliefs about voices questionnaire (BAVQ-R). *British Journal of Psychiatry*, *177*(SEPT), 229–232. https://doi.org/10.1192/bjp.177.3.229

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. https://doi.org/10.1348/147608308X320116

Cicchetti, D. V. (1994). Guidelines, Criteria, and Rules of Thumb for Evaluating Normed and Standardized Assessment Instruments in Psychology. *Psychological Assessment*, *6*(4), 284–290. https://doi.org/10.1037/1040-3590.6.4.284

Clark, D. M. (2004). Developing new treatments: On the interplay between theories, experimental science and clinical innovation. *Behaviour Research and Therapy*, *42*(9), 1089–1104. https://doi.org/10.1016/j.brat.2004.05.002

Clark, D. M. (2018). Realizing the Mass Public Benefit of Evidence-Based Psychological Therapies: The IAPT Program. *Annual Review of Clinical Psychology*, *14*, 159–183. https://doi.org/10.1146/annurev-clinpsy-050817-084833

Clark, D. M., Salkovskis, P. M., Hackmann, A., Middleton, H., Anastasiades, P., & Gelder, M. (1994). A comparison of cognitive therapy, applied relaxation and imipramine in the treatment of panic disorder. *British Journal of Psychiatry*, *164*(JUNE), 759–769. https://doi.org/10.1192/bjp.164.6.759

Corbin, J., & Strauss, A. (2015). *Basics of Qualitative Research*. Sage.

Corstens, D., Longden, E., McCarthy-Jones, S., Waddingham, R., & Thomas, N. (2014). Emerging perspectives from the hearing voices movement: Implications for research and practice. *Schizophrenia Bulletin*, *40*(SUPPL. 4), S285–S294. https://doi.org/10.1093/schbul/sbu007

Craig, T. K., Rus-Calafell, M., Ward, T., Leff, J. P., Huckvale, M., Howarth, E., Emsley, R., & Garety, P. A. (2018a). AVATAR therapy for auditory verbal hallucinations in people with psychosis: a single-blind, randomised controlled trial. *The Lancet Psychiatry*, *5*(1), 31–40. https://doi.org/10.1016/S2215-0366(17)30427-3

Craig, T. K., Rus-Calafell, M., Ward, T., Leff, J. P., Huckvale, M., Howarth, E., Emsley, R., & Garety, P. A. (2018b). AVATAR therapy for auditory verbal hallucinations in people with psychosis: a single-blind, randomised controlled trial. *The Lancet Psychiatry*, *5*(1), 31–40. https://doi.org/10.1016/S2215-0366(17)30427-3

Daalman, K., van Zandvoort, M., Bootsman, F., Boks, M., Kahn, R., & Sommer, I. (2011). Auditory verbal hallucinations and cognitive functioning in healthy individuals. *Schizophrenia Research*, *132*(2–3), 203–207. https://doi.org/10.1016/j.schres.2011.07.013

de Boer, J. N., Corona Hernández, H., Gerritse, F., Brederoo, S. G., Wijnen, F. N. K., & Sommer, I. E. (2021). Negative content in auditory verbal hallucinations: a natural language processing approach. *Cognitive Neuropsychiatry*, *0*(0), 1–11. https://doi.org/10.1080/13546805.2021.1941831

de Bont, P. A. J. M., van den Berg, D. P. G., van der Vleugel, B. M., de Roos, C., de Jongh, A., van der Gaag, M., & van Minnen, A. (2015). Predictive validity of the trauma screening questionnaire in detecting post-traumatic stress disorder in patients with psychotic disorders. *British Journal of Psychiatry*, *206*(5), 408–416. https://doi.org/10.1192/bjp.bp.114.148486

Delespaul, P., deVries, M., & van Oz, J. (2002). Determinants of occurrence and recovery from hallucinations in daily life. *Social Psychiatry and Psychiatric Epidemiology*, *37*, 97–104.

DeVylder, J. E., Lehmann, M., & Chen, F. pei. (2015). Social and clinical correlates of the persistence of psychotic experiences in the general population. *Schizophrenia Research*, *169*(1–3), 286–291. https://doi.org/10.1016/j.schres.2015.08.039

Domicile. (2012). *Hearing Voices Network: my experiences*.

Dudley, R., Siitarinen, J., James, I., & Dodgson, G. (2009). What do people with psychosis think caused their psychosis? A Q methodology study. *Behavioural and Cognitive Psychotherapy*, *37*(1), 11–24. https://doi.org/10.1017/S1352465808004955

Eckland, N. S., Sperry, S. H., Castro, A. A., & Berenbaum, H. (2022). Intensity, Frequency, and Differentiation of Discrete Emotion Categories in Daily Life and Their Associations With Depression, Worry, and Rumination. *Emotion*, *22*(2), 305–317. https://doi.org/10.1037/emo0001038.supp

Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, *38*(4), 319–345. https://doi.org/10.1016/S0005-7967(99)00123-0

Ehlers, A., & Clark, D. M. (2008). Post-traumatic stress disorder: The development of effective psychological treatments. *Nordic Journal of Psychiatry*, *62*(SUPPL. 47), 11–18. https://doi.org/10.1080/08039480802315608

Ehlers, A., Clark, D. M., Dunmore, E., Jaycox, L., Meadows, E., & Foa, E. B. (1998). Predicting response to exposure treatment in PTSD: The role of mental defeat and alienation. *Journal of Traumatic Stress*, *11*(3), 457–471. https://doi.org/10.1023/A:1024448511504

El-Den, S., Chen, T. F., Gan, Y. L., Wong, E., & O'Reilly, C. L. (2018). The psychometric properties of depression screening tools in primary healthcare settings: A systematic review. In *Journal of Affective Disorders* (Vol. 225, pp. 503–522). Elsevier B.V. https://doi.org/10.1016/j.jad.2017.08.060

Ensum, I., & Morrison, A. P. (2003). The effects of focus of attention on attributional bias in patients experiencing auditory hallucinations. *Behaviour Research and Therapy*, *41*(8), 895–907. https://doi.org/10.1016/S0005-7967(02)00102-X

Espie, C. A., Kyle, S. D., Hames, P., Gardani, M., Fleming, L., & Cape, J. (2014). The Sleep Condition Indicator: a clinical screening tool to evaluate insomnia disorder. *BMJ Open*, *4*(3), e004183. https://doi.org/10.1136/bmjopen-2013-004183

Evensen, S., Wisloff, T., Lystad, J. U., Bull, H., Ueland, T., & Falkum, E. (2016). Prevalence, employment rate, and cost of schizophrenia in a high-income welfare society: A population-based study using

comprehensive health and welfare registers. *Schizophrenia Bulletin*, *42*(2), 476–483. https://doi.org/10.1093/schbul/sbv141

Fowler, D., Freeman, D., Smith, B., Kuipers, E., Bebbington, P., Bashforth, H., Coker, S., Hodgekins, J., Gracie, A., Dunn, G., & Garety, P. (2006). The Brief Core Schema Scales (BCSS): psychometric properties and associations with paranoia and grandiosity in non-clinical and psychosis samples. *Psychological Medicine*, *36*(6), 749–759. https://doi.org/10.1017/S0033291706007355

Fowler, D., Hodgekins, J., French, P., Marshall, M., Freemantle, N., McCrone, P., Everard, L., Lavis, A., Jones, P. B., Amos, T., Singh, S., Sharma, V., & Birchwood, M. (2018). Social recovery therapy in combination with early intervention services for enhancement of social recovery in patients with first-episode psychosis (SUPEREDEN3): a single-blind, randomised controlled trial. *The Lancet Psychiatry*, *5*(1), 41–50. https://doi.org/10.1016/S2215-0366(17)30476-5

Freeman, D. (2016). Persecutory delusions: a cognitive perspective on understanding and treatment. *The Lancet Psychiatry*, *3*(7), 685–692. https://doi.org/10.1016/S2215-0366(16)00066-3

Freeman, D., Bradley, J., Antley, A., Bourke, E., DeWeever, N., Evans, N., Černis, E., Sheaves, B., Waite, F., Dunn, G., Slater, M., & Clark, D. M. (2016). Virtual reality in the treatment of persecutory delusions: Randomised controlled experimental study testing how to reduce delusional conviction. *British Journal of Psychiatry*, *209*(1). https://doi.org/10.1192/bjp.bp.115.176438

Freeman, D., Bradley, J., Waite, F., Sheaves, B., DeWeever, N., Bourke, E., McInerney, J., Evans, N., Černis, E., Lister, R., Garety, P., & Dunn, G. (2016). Targeting Recovery in Persistent Persecutory Delusions: A Proof of Principle Study of a New Translational Psychological Treatment (the Feeling Safe Programme). *Behavioural and Cognitive Psychotherapy*, *44*(April), 539–552. https://doi.org/10.1017/S1352465816000060

Freeman, D., Dunn, G., Startup, H., Pugh, K., Cordwell, J., Mander, H., Černis, E., Wingham, G., Shirvell, K., & Kingdon, D. (2015). Effects of cognitive behaviour therapy for worry on persecutory delusions in patients with psychosis (WIT): a parallel, single-blind, randomised controlled trial with a mediation analysis. *Lancet Psychiatry*, *2*(4), 305–313. https://doi.org/10.1016/S2215-0366(15)00039-5

Freeman, D., Emsley, R., Diamond, R., Collett, N., Bold, E., Chadwick, E., Isham, L., Bird, J. C., Edwards, D., Kingdon, D., Fitzpatrick, R., Kabir, T., Waite, F., Carr, L., Causier, C., Černis, E., Kirkham, M., Lambe, S., Lister, R., … Twivy, E. (2021). Comparison of a theoretically driven cognitive therapy (the Feeling Safe Programme) with befriending for the treatment of persistent persecutory delusions: a parallel, single-blind, randomised controlled trial. *The Lancet Psychiatry*, *8*(8), 696–707. https://doi.org/10.1016/S2215-0366(21)00158-9

Freeman, D., Pugh, K., Dunn, G., Evans, N., Sheaves, B., Waite, F., Cernis, E., Lister, R., & Fowler, D. (2014). An early Phase II randomised controlled trial testing the effect on persecutory delusions of using CBT to reduce negative cognitions about the self: the potential benefits of enhancing self confidence. *Schizophrenia Research*, *160*(1–3), 186–192. https://doi.org/10.1016/j.schres.2014.10.038

Freeman, D., Sheaves, B., Goodwin, G. M., Yu, L.-M., Nickless, A., Harrison, P. J., Emsley, R., Luik, A. I., Foster, R. G., Wadekar, V., Hinds, C., Gumley, A., Jones, R., Lightman, S., Jones, S., Bentall, R., Kinderman, P., Rowse, G., Brugha, T., … Espie, C. A. (2017a). The effects of improving sleep on mental health (OASIS): a randomised controlled trial with mediation analysis. *The Lancet Psychiatry*, *4*(10), 749–758. https://doi.org/10.1016/S2215-0366(17)30328-0

Freeman, D., Sheaves, B., Goodwin, G. M., Yu, L.-M., Nickless, A., Harrison, P. J., Emsley, R., Luik, A. I., Foster, R. G., Wadekar, V., Hinds, C., Gumley, A., Jones, R., Lightman, S., Jones, S., Bentall, R., Kinderman, P., Rowse, G., Brugha, T., … Espie, C. A. (2017b). The effects of improving sleep on mental health (OASIS): a randomised controlled trial with mediation analysis. *The Lancet Psychiatry*, *4*(10). https://doi.org/10.1016/S2215-0366(17)30328-0

Freeman, D., Sheaves, B., Waite, F., Harvey, A. G., & Harrison, P. J. (2020). Sleep disturbance and psychiatric disorders. *The Lancet Psychiatry*, *7*(7), 628–637. https://doi.org/10.1016/S2215-0366(20)30136-X

Freeman, D., Taylor, K. M., Molodynski, A., & Waite, F. (2019). Treatable clinical intervention targets for patients with schizophrenia. *Schizophrenia Research*, *211*, 44–50. https://doi.org/10.1016/j.schres.2019.07.016

Freeman, D., Thompson, C., Vorontsova, N., Dunn, G., Carter, L., Garety, P., Kuipers, E., Slater, M., Antley, A., Glucksman, E., & Ehlers, A. (2013). Paranoia and post-traumatic stress disorder in the months after a physical assault: a longitudinal study examining shared and differential predictors. *Psychological Medicine*, 1–12. https://doi.org/10.1017/S003329171300038X

Freeman, D., Waite, F., Startup, H., Myers, E., Lister, R., McInerney, J., Harvey, A. G., Geddes, J., Zaiwalla, Z., Luengo-Fernandez, R., Foster, R. G., Clifton, L., & Yu, L.-M. (2015). Efficacy of cognitive behavioural therapy for sleep improvements in patients with persistent delusions and hallucinations (BEST): a prospective, assessor-blind, randomised controlled pilot trial. *The Lancet Psychiatry*, *2*, 975–983.

Frith, C. D. (1987). The positive and negative symptoms of schizophrenia reflect impairments in the perception and initiation of action. *Psychological Medicine*, *17*(3), 631–648. https://doi.org/10.1017/S0033291700025873

Fujita, J., Takahashi, Y., Nishida, A., Okumura, Y., Ando, S., Kawano, M., Toyohara, K., Sho, N., Minami, T., & Arai, T. (2015). Auditory verbal hallucinations increase the risk for suicide attempts in adolescents with suicidal ideation. *Schizophrenia Research*, *168*(1–2), 209–212. https://doi.org/10.1016/j.schres.2015.07.028

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*(2), 189–195.

GBD 2016 Disease and Injury Incidence and Prevalence Collaborators. (2017). Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*, *390*, 1211–1259. https://doi.org/10.1016/S0140-6736(17)32154-2

Glaser, B., & Strauss, A. (1967). *The Discovery of Grounded Theory*. Aldine.

Goghari, V. M., & Harrow, M. (2016). Twenty year multi-follow-up of different types of hallucinations in schizophrenia, schizoaffective disorder, bipolar disorder, and depression. *Schizophrenia Research*, *176*(2–3), 371–377. https://doi.org/10.1016/j.schres.2016.06.027

Green, M. F., & Kinsbourne, M. (1989). Auditory Hallucinations in Schizophrenia: Does Humming Help? *Biological Psychiatry*, *25*, 633–635.

Green, M. F., & Kinsbourne, M. (1990). Subvocal activity and auditory hallucinations: Clues for behavioral treatments? *Schizophrenia Bulletin*, *16*(4), 617–625. https://doi.org/10.1093/schbul/16.4.617

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. http://www.ncbi.nlm.nih.gov/pubmed/10473315

Hardy, A. (2017). Pathways from trauma to psychotic experiences: A theoretically informed model of posttraumatic stress in psychosis. *Frontiers in Psychology*, *8*(697). https://doi.org/10.3389/fpsyg.2017.00697

Hardy, A., Fowler, D., Freeman, D., Smith, B., Steel, C., Evans, J., Garety, P., Kuipers, E., Bebbington, P., & Dunn, G. (2005). Trauma and hallucinatory experience in psychosis. *Journal of Nervous and Mental Disease*, *193*(8), 501–507. https://doi.org/10.1097/01.nmd.0000172480.56308.21

Hayward, M., Denney, J., Vaughan, S., & Fowler, D. (2008a). The voice and you: Development and psychometric evaluation of a measure of relationships with voices. *Clinical Psychology and Psychotherapy*, *15*(1), 45–52. https://doi.org/10.1002/cpp.561

Hayward, M., Denney, J., Vaughan, S., & Fowler, D. (2008b). The voice and you: Development and psychometric evaluation of a measure of relationships with voices. *Clinical Psychology and Psychotherapy*, *15*(1), 45–52. https://doi.org/10.1002/cpp.561

Hayward, M., Jones, A. M., Bogen-Johnston, L., Thomas, N., & Strauss, C. (2017). Relating Therapy for distressing auditory hallucinations: A pilot randomized controlled trial. *Schizophrenia Research*, *183*, 137–142. https://doi.org/10.1016/j.schres.2016.11.019

Hayward, M., Schlier, B., Strauss, C., Rammou, A., & Lincoln, T. (2020). Construction and validation of the Approve questionnaires – Measures of relating to voices and other people. *Schizophrenia Research*, *220*, 254–260. https://doi.org/10.1016/j.schres.2020.03.003

Hazell, C. M., Hayward, M., Cavanagh, K., Jones, A. M., & Strauss, C. (2018). Guided self-help cognitive-behaviour Intervention for VoicEs (GiVE): Results from a pilot randomised controlled trial in a transdiagnostic sample. *Schizophrenia Research*, *195*, 441–447. https://doi.org/10.1016/j.schres.2017.10.004

Holm, S. (1979). A simple sequentially rejective multiple test procedure. *Scandinavian Journal of Statistics*, *6*(2), 65–70.

Hor, K., & Taylor, M. (2010). Suicide and schizophrenia : a systematic review of rates and risk factors. *Journal of Psychopharmacology*, *24*(11), 81–90. https://doi.org/10.1177/1359786810385490

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Isham, L., Griffith, L., Boylan, A., Hicks, A., Wilson, N., Byrne, R., Sheaves, B., Bentall, R. P., & Freeman, D. (2019). *Understanding, treating, and renaming grandiose delusions : A qualitative study*. https://doi.org/10.1111/papt.12260

Jacobucci, R., Brandmaier, A. M., & Kievit, R. A. (2019). A Practical Guide to Variable Selection in Structural Equation Modeling by Using Regularized Multiple-Indicators, Multiple-Causes Models. *Advances in Methods and Practices in Psychological Science*, *2*(1), 55–76. https://doi.org/10.1177/2515245919826527

Jacobucci, R., Grimm, K. J., Brandmaier, A. M., Serang, S., Kievit, R. A., Scharf, F., Li, X., & Ye, A. (2021). *regsem: Regularized Structural Equation Modeling* (1.8.0).

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, *39*(1), 31–36. https://doi.org/10.1007/BF02291575

Kelleher, I., & Devylder, J. E. (2017). Hallucinations in borderline personality disorder and common mental disorders. *The British Journal of Psychiatry*, *210*, 230–231. https://doi.org/10.1192/bjp.bp.116.185249

Kendler, K. S., & Campbell, J. (2009). Interventionist causal models in psychiatry: repositioning the mind-body problem. *Psychological Medicine*, *39*(6), 881–887. https://doi.org/10.1017/S0033291708004467

Kingdon, D. G., Ashcroft, K., Bhandari, B., Gleeson, S., Warikoo, N., Symons, M., Taylor, L., Lucas, E., & Mahendra, R. (2010). Schizophrenia and borderline personality disorder: similarities and differences in the experience of auditory hallucinations, paranoia and childhood trauma. *The Journal of Nervous and Mental Disease*, *198*, 399–403. https://doi.org/10.1097/NMD.0b013e3181e08c27

Kirkbride, J. B., Errazuriz, A., Croudace, T. J., Morgan, C., Jackson, D., McCrone, P., Murray, R. M., & Jones, P. B. (2011). *Systematic Review of the Incidence and Prevalence of Schizophrenia and Other Psychoses in England*.

Kleim, B., Ehlers, A., & Glucksman, E. (2007). Early predictors of chronic post-traumatic stress disorder in assault survivors. *Psychological Medicine*, *37*(10), 1457–1467. https://doi.org/10.1017/S0033291707001006

Knudsen, C. B., Hemager, N., Jepsen, J. R. M., Gregersen, M., Greve, A. N., Andreassen, A. K., Veddum, L., Brandt, J. M., Krantz, M. F., Søndergaard, A., Burton, B. K., Thorup, A. A. E., Nordentoft, M., Lambek, R., Mors, O., & Bliksted, V. F. (2022). Early Childhood Neurocognition in Relation to Middle Childhood Psychotic Experiences in Children at Familial High Risk of Schizophrenia or Bipolar Disorder and Population-Based Controls: The Danish High Risk and Resilience Study. *Schizophrenia Bulletin*. https://doi.org/10.1093/schbul/sbac198

Kraeplin, E. (1919). *Dementia praecox and paraphrenia* (R. Barclay & G. Robertson, Eds.). Chicago Medical Book Co.

Krakow, B. J., Melendrez, D. C., Johnston, L. G., Clark, J. O., Santana, Erin, M., Warner, T. D., Hollified, M. A., Schrader, R., Sisley, B. M., & Lee, S. A. (2002). Sleep dynamic therapy for Cerro Grande fire evacuees. *Journal of Clinical Psychiatry*, *63*(8), 673–684.

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9. Validity of a brief depression severity measure. *Journal of General Internal Medicine*, *16*, 606–613.

Li, C.-H. (2016). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior Research Methods*, *48*(3), 936–949. https://doi.org/10.3758/s13428-015-0619-7

Longden, E., Read, J., & Dillon, J. (2018). Assessing the Impact and Effectiveness of Hearing Voices Network Self-Help Groups. *Community Mental Health Journal*, *54*(2), 184–188. https://doi.org/10.1007/s10597-017-0148-1

Lubben, J. E. (1988). Assessing social networks among elderly populations. *Family and Community Health*, *11*(3), 42–52.

Maassen, G. H., & Bakker, A. B. (2001). Suppressor variables in path analysis: definitions and interpretations. *Sociological Methods & Research*, *30*(2), 241–270.

Mackie, J. L. (1965). Causes and Conditions. *American Philosophical Quarterly*, *2*(4), 245–264.

Maijer, K., Begemann, M. J. H., Palmen, S. J. M. C., Leucht, S., & Sommer, I. E. C. (2018). Auditory hallucinations across the lifespan: A systematic review and meta-analysis. *Psychological Medicine*, *48*(6), 879–888. https://doi.org/10.1017/S0033291717002367

Marder, S. R., & Galderisi, S. (2017). The current conceptualization of negative symptoms in schizophrenia. *World Psychiatry*, *16*(1), 14–24. https://doi.org/10.1002/wps.20385

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. https://doi.org/10.1348/147608310X524883

McCarthy-Jones, S., Smailes, D., Corvin, A., Gill, M., Morris, D. W., Dinan, T. G., Murphy, K. C., Anthony O'Neill, F., Waddington, J. L., Australian Schizophrenia Research Bank, Donohoe, G., & Dudley, R. (2017). Occurrence and co-occurrence of hallucinations by modality in schizophrenia-spectrum disorders. *Psychiatry Research*, *252*(February), 154–160. https://doi.org/10.1016/j.psychres.2017.01.102

McCarthy-Jones, S., Trauer, T., Mackinnon, A., Sims, E., Thomas, N., & Copolov, D. L. (2014). A New Phenomenological Survey of Auditory Hallucinations : Evidence for Subtypes and Implications for Theory and Practice. *Schizophrenia Bulletin*, *40*(1), 225–235. https://doi.org/10.1093/schbul/sbs156

McManus, F., Sacadura, C., & Clark, D. M. (2008). Why social anxiety persists: An experimental investigation of the role of safety behaviours as a maintaining factor. *Journal of Behavior Therapy and Experimental Psychiatry*, *39*(2), 147–161. https://doi.org/10.1016/j.jbtep.2006.12.002

Meaden, A., Keen, N., Aston, R., Barton, K., & Bucci, S. (2013). *Cognitive therapy for command hallucinations: an advanced practical companion*. Routledge.

Meltzer, H., Bebbington, P., Dennis, M. S., Jenkins, R., McManus, S., & Brugha, T. S. (2013). Feelings of loneliness among adults with mental disorder. *Social Psychiatry and Psychiatric Epidemiology*, *48*(1), 5–13. https://doi.org/10.1007/s00127-012-0515-8

Michalska Da Rocha, B., Rhodes, S., Vasilopoulou, E., & Hutton, P. (2018). Loneliness in Psychosis: A Meta-analytical Review. *Schizophrenia Bulletin*, *44*(1), 114–125. https://doi.org/10.1093/schbul/sbx036

Moritz, S., & Larøi, F. (2008). Differences and similarities in the sensory and cognitive signatures of voice-hearing , intrusions and thoughts. *Schizophrenia Research*, *102*, 96–107. https://doi.org/10.1016/j.schres.2008.04.007

Morrison, A. P. (2001). The interpretation of intrusions in psychosis: an integrative cognitive approach to hallucinations and delusions. *Behavioural and Cognitive Psychotherapy*, *29*(1994), 257–276.

Morrison, A. P., Burke, E., Murphy, E., Pyle, M., Bowe, S., Varese, F., Dunn, G., Chapman, N., Hutton, P., Welford, M., & Wood, L. J. (2016). Cognitive therapy for internalised stigma in people experiencing psychosis: A pilot randomised controlled trial. *Psychiatry Research*, *240*, 96–102. https://doi.org/10.1016/j.psychres.2016.04.024

Morrison, A. P., Haddock, G., & Tarrier, N. (1995). Intrusive Thoughts and Auditory Hallucinations : A Cognitive Approach. *Behavioural and Cognitive Psychotherapy*, *23*, 265–280.

Morrison, A. P., Wells, A., & Nothard, S. (2000). Cognitive factors in predisposition to auditory and visual hallucinations. *British Journal of Clinical Psychology*, *39*(1), 67–78. https://doi.org/10.1348/014466500163112

Morrison, A. P., Wells, A., & Nothard, S. (2002). Cognitive and emotional predictors of predisposition to hallucinations in non-patients. *British Journal of Clinical Psychology*, *41*(3), 259–270. https://doi.org/10.1348/014466502760379127

National Collaborating Centre for Mental Health. (2014). *Psychosis and Schizophrenia in adults: the NICE guideline on treatment and management*.

Nayani, T. H., & David, A. S. (1996a). The auditory hallucination: a phenomenological survey. *Psychological Medicine*, *26*(1), 177–189. https://doi.org/10.1017/s003329170003381x

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

Norman, R. M. G., Malla, A. K., Manchanda, R., Harricharan, R., Takhar, J., & Northcott, S. (2005). Social support and three-year symptom and admission outcomes for first episode psychosis. *Schizophrenia Research*, *80*(2–3), 227–234. https://doi.org/10.1016/j.schres.2005.05.006

Ohayon, M. M., & Schatzberg, A. F. (2002). Prevalence of depressive episodes with psychotic features in the general population. *American Journal of Psychiatry*, *159*(11), 1855–1861. https://doi.org/10.1176/appi.ajp.159.11.1855

Onwumere, J., Parkyn, G., Learmonth, S., & Kuipers, E. (2019). The last taboo: The experience of violence in first-episode psychosis caregiving relationships. *Psychology and Psychotherapy: Theory, Research and Practice*, *92*(1), 1–19. https://doi.org/10.1111/papt.12173

Pappa, E., Peters, E., & Bell, V. (2021). Insight-related beliefs and controllability appraisals contribute little to hallucinated voices: a transdiagnostic network analysis study. *European Archives of Psychiatry and Clinical Neuroscience*, *271*(8), 1525–1535. https://doi.org/10.1007/s00406-020-01166-3

Paulik, G., Steel, C., & Arntz, A. (2019). Imagery rescripting for the treatment of trauma in voice hearers: A case series. *Behavioural and Cognitive Psychotherapy*, *47*(6), 709–725. https://doi.org/10.1017/S1352465819000237

Peters, E., Hardy, A., Dudley, R., Varese, F., Greenwood, K., Steel, C., Emsley, R., Keen, N., Bowe, S., Swan, S., Underwood, R., Longden, E., Byford, S., Potts, L., Heslin, M., Grey, N., Turkington, D., Fowler, D., Kuipers, E., & Morrison, A. (2022). Multisite randomised controlled trial of trauma-focused cognitive behaviour therapy for psychosis to reduce post-traumatic stress symptoms in people with co-morbid post-traumatic stress disorder and psychosis, compared to treatment as usual: study protocol for the STAR (Study of Trauma And Recovery) trial. *Trials*, *23*(1). https://doi.org/10.1186/s13063-022-06215-x

Peters, E. R., Williams, S. L., Cooke, M. A., & Kuipers, E. (2012). It's not what you hear, it's the way you think about it: Appraisals as determinants of affect and behaviour in voice hearers. *Psychological Medicine*, *42*(7), 1507–1514. https://doi.org/10.1017/S0033291711002650

Peters, E., Ward, T., Jackson, M., Morgan, C., Charalambides, M., McGuire, P., Woodruff, P., Jacobsen, P., Chadwick, P., & Garety, P. A. (2016). Clinical, socio-demographic and psychological characteristics in individuals with persistent psychotic experiences with and without a "need for care." *World Psychiatry*, *15*(1), 41–52.

QSR International Pty Ltd. (2018). *NVivo* (Version 12).

R Core Team. (2021). *R: A language and environment for statistical computing.* (4.0.5). R Foundation for Statistical Computing. https://www.r-project.org/

Reeve, S., Emsley, R., Sheaves, B., & Freeman, D. (2018). Disrupting Sleep: The Effects of Sleep Loss on Psychotic Experiences Tested in an Experimental Study With Mediation Analysis. *Schizophrenia Bulletin*, *44*(3), 662–671. https://doi.org/10.1093/schbul/sbx103

Reeve, S., Nickless, A., Sheaves, B., & Freeman, D. (2018). Insomnia, negative affect, and psychotic experiences: Modelling pathways over time in a clinical observational study. *Psychiatry Research*, *269*(July), 673–680. https://doi.org/10.1016/j.psychres.2018.08.090

Reeve, S., Sheaves, B., & Freeman, D. (2018). Sleep Disorders in Early Psychosis: Incidence, Severity, and Association With Clinical Symptoms. *Schizophrenia Bulletin*, 1–9. https://doi.org/10.1093/schbul/sby129

Rehman, A., Waite, F., Sheaves, B., Biello, S., Freeman, D., & Gumley, A. (2016). Clinician perceptions of sleep problems, and their treatment, in patients with non-affective psychosis. *Psychosis*, *2439*(July), 1–11. https://doi.org/10.1080/17522439.2016.1206955

Revelle, W. (2020). *psych: Procedures for Personality and Psychological Research* (2.1.3). Northwestern University. https://cran.r-project.org/package=psych

Riemann, D., Benz, F., Dressle, R. J., Espie, C. A., Johann, A. F., Blanken, T. F., Leerssen, J., Wassing, R., Henry, A. L., Kyle, S. D., Spiegelhalder, K., & Van Someren, E. J. W. (2022). Insomnia disorder: State of the science and challenges for the future. In *Journal of Sleep Research* (Vol. 31, Issue 4, p. e13604). John Wiley and Sons Inc. https://doi.org/10.1111/jsr.13604

Romme, M. A., & Escher, A. D. (1989). Hearing Voices. *Schizophrenia Bulletin*, *15*(2), 209–216.

Rooke, O., & Birchwood, M. (1998). Loss, humiliation and entrapment as appraisals of schizophrenic illness: A prospective study of depressed and non-depressed patients. *British Journal of Clinical Psychology*, *37*(3), 259–268. https://doi.org/10.1111/j.2044-8260.1998.tb01384.x

Rosen, C., McCarthy-jones, S., Jones, N., Chase, K. A., & Sharma, R. P. (2018). Negative voice-content as a full mediator of a relation between childhood adversity and distress ensuring from hearing voices. *Schizophrenia Research*, *199*, 361–366. https://doi.org/10.1016/j.schres.2018.03.030.Negative

Rosseel, Y. (2012). *Lavaan: An R Package for Structural Equation Modeling. Journal of Statistical Software*. *48*(2), 1–36. https://www.jstatsoft.org/v48/i02/

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. https://doi.org/10.1016/j.cpr.2011.03.010

Salokangas, R. K. R. (1997). Living situation, social network and outcome in schizophrenia: A five- year prospective follow-up study. *Acta Psychiatrica Scandinavica*, *96*(6), 459–468. https://doi.org/10.1111/j.1600-0447.1997.tb09948.x

Saunders, C. (2015). The art of medicine: Hearing medieval voices. *The Lancet*, *386*(10009), 2136–2137. https://doi.org/10.1016/S0140-6736(15)01061-2

Schutte, M. J. L., Linszen, M. M. J., Marschall, T. M., Dominic, H., Koops, S., Dellen, E. van, Heringa, S. M., Slooter, A. J. C., Teunisse, R., Heuvel, O. A. van den, Lemstra, A. W., Foncke, E. M. J., Slotema, C. W., Jong, J. de, Rossell, S. L., & Sommer, I. E. C. (2020). Hallucinations and other psychotic experiences across diagnoses: A comparison of phenomenological features. *Psychiatry Research*, *292*(February), 113314. https://doi.org/10.1016/j.psychres.2020.113314

Scott, M., Rossell, S. L., Toh, W. L., & Thomas, N. (2020). The relationship between anxiety, depression, and subtypes of negative auditory verbal hallucination (AVH) content in affective and non-affective psychosis. *Psychiatry Research*, *294*(October), 113500. https://doi.org/10.1016/j.psychres.2020.113500

Shawyer, F., Ratcliff, K., Mackinnon, A., Farhall, J., Hayes, S. C., & Copolov, D. (2007). The Voices Acceptance and Action Scale (VAAS): Pilot data. *Journal of Clinical Psychology*, *63*(6), 593–606. https://doi.org/10.1002/jclp.20366

Sheaves, B., Bebbington, P. E., Goodwin, G. M., Harrison, P. J., Espie, C. A., Foster, R. G., & Freeman, D. (2016). Insomnia and hallucinations in the general population: findings from the 2000 and 2007 British Psychiatric Morbidity Surveys. *Psychiatry Research*, *241*, 141–146.

Sheaves, B., Holmes, E. A., Rek, S., Taylor, K. M., Nickless, A., Waite, F., Germain, A., Espie, C. A., Harrison, P. J., Foster, R., & Freeman, D. (2019). Cognitive Behavioural Therapy for Nightmares for Patients with Persecutory Delusions (Nites): An Assessor-Blind, Pilot Randomized Controlled Trial. *Canadian Journal of Psychiatry*, *64*(10), 686–696. https://doi.org/10.1177/0706743719847422

Sheaves, B., Johns, L., Černis, E., Griffith, L., & Freeman, D. (2021). The challenges and opportunities of social connection when hearing derogatory and threatening voices: A thematic analysis with patients experiencing psychosis. *Psychology and Psychotherapy: Theory, Research and Practice*, *94*(2), 341–356. https://doi.org/10.1111/papt.12303

Sheaves, B., Johns, L., Griffith, L., Isham, L., Kabir, T., & Freeman, D. (2020). Why do patients with psychosis listen to and believe derogatory and threatening voices? 21 reasons given by patients. *Behavioural and Cognitive Psychotherapy*, *epub ahead*, 1–15. https://doi.org/10.1017/S1352465820000429

Sheaves, B., Johns, L., Loe, B. S., Bold, E., Černis, E., Molodynski, A., & Freeman, D. (2022). Listening to and Believing Derogatory and Threatening Voices. *Schizophrenia Bulletin*, 1–10. https://doi.org/10.1093/schbul/sbac101

Sheaves, B., Onwumere, J., Keen, N., Stahl, D., & Kuipers, E. (2015). Nightmares in patients with psychosis: the relation with sleep, psychotic, affective and cognitive symptoms. *Canadian Journal of Psychiatry*, *60*(8), 354–361.

Skivington, K., Matthews, L., Simpson, S. A., Craig, P., Baird, J., Blazeby, J. M., Boyd, K. A., Craig, N., French, D. P., McIntosh, E., Petticrew, M., Rycroft-Malone, J., White, M., & Moore, L. (2021). A new framework for developing and evaluating complex interventions: Update of Medical Research Council guidance. *The BMJ*, *374*. https://doi.org/10.1136/bmj.n2061

Slade, E. D. B. R. E. (1988). *Sensory deception: Towards a scientific analysis of hallucinations*. Croom Helm.

Smith, B., Fowler, D. G., Freeman, D., Bebbington, P., Bashforth, H., Garety, P., Dunn, G., & Kuipers, E. (2006). Emotion and psychosis: links between depression, self-esteem, negative schematic beliefs and delusions and hallucinations. *Schizophrenia Research*, *86*(1–3), 181–188. https://doi.org/10.1016/j.schres.2006.06.018

Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of Internal Medicine*, *166*(10), 1092–1097. https://doi.org/10.1001/archinte.166.10.1092

Statistics, O. for N. (2018). *Population of England and Wales: by ethnicity*. Gov.Uk. https://www.ethnicity-facts-figures.service.gov.uk/uk-population-by-ethnicity/national-and-regional-populations/population-of-england-and-wales/latest

Steel, C., Fowler, D., & Holmes, E. A. (2005). Trauma-related intrusions and psychosis: An information processing account. In *Behavioural and Cognitive Psychotherapy* (Vol. 33, Issue 2, pp. 139–152). https://doi.org/10.1017/S1352465804001924

Steel, C., Hardy, A., Smith, B., Wykes, T., Rose, S., Enright, S., Hardcastle, M., Landau, S., Baksh, M. F., Gottlieb, J. D., Rose, D., & Mueser, K. T. (2017). Cognitive-behaviour therapy for post-traumatic stress in schizophrenia. A randomized controlled trial. *Psychological Medicine*, *47*(1), 43–51. https://doi.org/10.1017/S0033291716002117

Steel, C., Schnackenberg, J., Perry, H., Longden, E., Greenfield, E., & Corstens, D. (2019). Making Sense of Voices: a case series. *Psychosis*, *11*(1), 3–15. https://doi.org/10.1080/17522439.2018.1559874

Strauss, C., Hugdahl, K., Waters, F., Hayward, M., Bless, J. J., Falkenberg, L. E., Kråkvik, B., Asbjørnsen, A. E., Johnsen, E., Sinkeviciute, I., Kroken, R. A., Løberg, E. M., & Thomas, N. (2018). The Beliefs about Voices Questionnaire – Revised: A factor structure from 450 participants. *Psychiatry Research*, *259*, 95–103. https://doi.org/10.1016/j.psychres.2017.09.089

Struk, A. A., Carriere, J. S. A., Cheyne, J. A., & Danckert, J. (2017). A Short Boredom Proneness Scale: Development and Psychometric Properties. *Assessment*, *24*(3), 346–359. https://doi.org/10.1177/1073191115609996

Sündermann, O., Onwumere, J., Kane, F., Morgan, C., & Kuipers, E. (2014). Social networks and support in first-episode psychosis: Exploring the role of loneliness and anxiety. *Social Psychiatry and Psychiatric Epidemiology*, *49*(3), 359–366. https://doi.org/10.1007/s00127-013-0754-3

Thomas, N., Farhall, J., & Shawyer, F. (2015). Beliefs about Voices and Schemas about Self and Others in Psychosis. *Behavioural and Cognitive Psychotherapy*, *43*(2), 209–223. https://doi.org/10.1017/S1352465813000817

Todman, M. (2003). Boredom and psychotic disorders: Cognitive and motivational issues. In *Psychiatry* (Vol. 66, Issue 2, pp. 146–167). https://doi.org/10.1521/psyc.66.2.146.20623

Tsang, A., Bucci, S., Branitsky, A., Kaptan, S., Rafiq, S., Wong, S., Berry, K., & Varese, F. (2021). The relationship between appraisals of voices (auditory verbal hallucinations) and distress in voice-

hearers with schizophrenia-spectrum diagnoses: A meta-analytic review. *Schizophrenia Research*, *230*, 38–47. https://doi.org/10.1016/j.schres.2021.02.013

Turner, D. T., Burger, S., Smit, F., Valmaggia, L. R., & van der Gaag, M. (2020). What Constitutes Sufficient Evidence for Case Formulation–Driven CBT for Psychosis? Cumulative Meta-analysis of the Effect on Hallucinations and Delusions. *Schizophrenia Bulletin*, *46*(5), 1072–1085. https://doi.org/10.1093/schbul/sbaa045

van den Berg, D. P. G., de Bont, P. A. J. M., van der Vleugel, B. M., de Roos, C., de Jongh, A., van Minnen, A., & van der Gaag, M. (2015). Prolonged exposure vs eye movement desensitization and reprocessing vs waiting list for posttraumatic stress disorder in patients with a psychotic disorder: A randomized clinical trial. *JAMA Psychiatry*, *72*(3), 259–267. https://doi.org/10.1001/jamapsychiatry.2014.2637

van den Berg, D., Tolmeijer, E., Jongeneel, A., Staring, A. B. P., Palstra, E., van der Gaag, M., & Hardy, A. (2022). Voice phenomenology as a mirror of the past. *Psychological Medicine*, 1–9. https://doi.org/10.1017/S0033291721004955

van Lieshout, R. J., & Goldberg, J. O. (2007). Quantifying self-reports of auditory verbal hallucinations in persons with psychosis. *Canadian Journal of Behavioural Science*, *39*(1), 73–77. https://doi.org/10.1037/cjbs2007006

Van Os, J., Driessen, G., Gunther, N., & Delespaul, P. (2000). Neighbourhood variation in incidence of schizophrenia. *British Journal of Psychiatry*, *176*(3), 243–248. https://doi.org/10.1192/bjp.176.3.243

Varese, F., Morrison, A. P., Beck, R., Heffernan, S., Law, H., & Bentall, R. P. (2016). Experiential avoidance and appraisals of voices as predictors of voice-related distress. *The British Journal of Clinical Psychology*, *55*(3), 320–331. https://doi.org/10.1111/bjc.12102

Waite, F., Diamond, R., Collett, N., Chadwick, E., Bold, E., Teale, A.-L., Taylor, K. M., Kirkham, M., Twivy, E., Causier, C., Carr, L., Bird, J. C., Černis, E., Isham, L., & Freeman, D. (2019). The comments of voices on the appearance of patients with psychosis: 'the voices tell me that I am ugly.' *BJPsych Open*, *5*(5), e86. https://doi.org/10.1192/bjo.2019.66

Waite, F., Evans, N., Myers, E., Startup, H., Lister, R., Harvey, A. G., & Freeman, D. (2015). The patient experience of sleep problems and their treatment in the context of current delusions and hallucinations. *Psychology and Psychotherapy: Theory, Research and Practice*, *89*(November), n/a-n/a. https://doi.org/10.1111/papt.12073

Ward, T., Rus-Calafell, M., Ramadhan, Z., Soumelidou, O., Fornells-Ambrojo, M., Garety, P., & Craig, T. K. J. (2020). AVATAR therapy for distressing voices: A comprehensive account of therapeutic targets. *Schizophrenia Bulletin*, *46*(5), 1038–1044. https://doi.org/10.1093/schbul/sbaa061

Watkins, S., Gupta, A., & Sanderson, C. (2019). The experience of talking about hearing voices with family, friends, and others. *Psychosis*, 1–10. https://doi.org/10.1080/17522439.2019.1690561

Woods, A., Jones, N., Alderson-Day, B., Callard, F., & Fernyhough, C. (2015). Experiences of hearing voices: Analysis of a novel phenomenological survey. *The Lancet Psychiatry*, *2*(4), 323–331. https://doi.org/10.1016/S2215-0366(15)00006-1

Xia, Y., & Yang, Y. (2019). RMSEA, CFI, and TLI in structural equation modeling with ordered categorical data: The story they tell depends on the estimation methods. *Behavior Research Methods*, *51*(1), 409–428. https://doi.org/10.3758/s13428-018-1055-2

Xu, Z., Müller, M., Heekeren, K., Theodoridou, A., Metzler, S., Dvorsky, D., Oexle, N., Walitza, S., Rössler, W., & Rüsch, N. (2016). Pathways between stigma and suicidal ideation among people at risk of psychosis. *Schizophrenia Research*, *172*(1–3), 184–188. https://doi.org/10.1016/j.schres.2016.01.048

Zwaard, R. van der, & Polak, M. A. (2001). Pseudohallucinations: A Pseudoconcept? A Review of the Validity of the Concept, Related to Associate Symptomatology. *Comprehensive Psychiatry*, *42*(1), 42–50. https://doi.org/10.1053/comp.2001.19752

8

Appendices

List of appendices

A. Full item pool: Listening and Believing – Assessment
B. Full item pool: Listening and Believing – Reasons
C. Listening and Believing – Assessment
D. Listening and Believing – Reasons (28 item full version)
E. Listening and Believing – Reasons (16 item short form version)
F. Listening and Believing – Reasons (5 item very brief version)
G. Adapted version of the Lubben Social Network Scale
H. Audit trail of key analysis decisions (Chapter Four)
I. Published papers
    a. In Behavioural and Cognitive Psychotherapy (Chapter Two)
    b. In Schizophrenia Bulletin (Chapter Three)
    c. In PAPTRAP (Chapter Four)

A. Full item pool: Listening and Believing – Assessment

Listening and believing nasty voices

Below are a range of statements about listening and believing nasty voices. These are any voices which threaten you, or put you down. It's important that you *do not* consider positive voices, or neutral voices when completing this questionnaire, only those that are threatening or put you down.
Please rate the degree to which you agree with each statement, based on your experience over the **past week**.

	LISTENING TO NASTY VOICES	**Never (0)**	**A bit of the time (1)**	**Most of the time (2)**	**All the time (3)**
1	I listen to what the nasty voices say.				
2	I want to keep listening to what the nasty voices have to say.				
3	I take in every word the nasty voices say.				
4	When the nasty voices start it's almost impossible to ignore what they say.				
5	I get sucked into the world of the nasty voices.				
6	I choose to listen to what the nasty voices say.				
7	When the nasty voices are quieter, I find myself waiting for them to start again.				
8	I want to hear what the nasty voices are saying when they start.				
9	I listen hard to the nasty voices to make sure I've heard what they are saying.				

10	I listen out for the nasty voices.				
11	It's difficult to focus on anything other than what the nasty voices say.				
12	There's nothing I can do but listen to what the nasty voices say.				
	BELIEVING NASTY VOICES	**Never (0)**	**A bit of the time (1)**	**Most of the time (2)**	**All the time (3)**
1	I believe what the nasty voices say.				
2	The nasty voices are right in what they say.				
3	I'm sure what the nasty voices say is true.				
4	The nasty voices are generally correct in what they say.				
5	The nasty voices tell the truth.				
6	I'm convinced what the nasty voices say is true.				
7	I have a gut feeling that what the nasty voices are saying is true.				
8	I believe most of what the nasty voices say.				
	IGNORING NASTY VOICES	**Never (0)**	**A bit of the time (1)**	**Most of the time (2)**	**All the time (3)**
1	When the nasty voices are quieter, I forget I hear them.				
2	I give the nasty voices no head space.				
3	I ignore what the nasty voices say.				

4	When the nasty voices start, I find a way to ignore them.				
5	I tune out the nasty voices.				
6	I avoid getting sucked into the world of the nasty voices.				
7	When the nasty voices are quieter I forget about the things they say.				
8	I can focus away from what the nasty voices say.				
9	I can choose whether to listen to the nasty voices.				
10	I barely notice the nasty things the voices say.				
11	I ignore what the nasty voices say.				
12	I can avoid getting distracted by the nasty voices.				
13	I pay no attention to what the nasty voices say.				
14	I take no notice of what the nasty voices say.				
	DISPUTING NASTY VOICES	**Never (0)**	**A bit of the time (1)**	**Most of the time (2)**	**All the time (3)**
1	I shrug off what the nasty voices say.				
2	I just don't care what the nasty voices say.				
3	I'm not fussed by what the nasty voices say.				
4	What the nasty voices say doesn't matter to me.				

5	I don't believe what the nasty voices say.				
6	I question what the nasty voices say.				
7	I can brush off all the negative things that the nasty voices say.				
8	I trust my own judgement instead of the nasty voices.				
9	I usually question whether the nasty voices are telling the truth.				
10	I make my own mind up about whether the nasty voices are right.				
11	I consider what the nasty voices say and realise it's not right.				
12	I don't care what the nasty voices think, I decide what to believe.				

B. Full item pool: Listening and Believing – Reasons

Reasons for listening and believing nasty voices

Below are a range of statements about why people listen and believe nasty voices (voices which threaten you, or put you down). It's important that you *do not* consider positive voices, or neutral voices when completing this questionnaire, only those that are threatening or put you down. Please rate the extent to which each statement describes your experience of hearing these voices over the past **week**.

REASONS RELATED TO BEING WORN DOWN						
	I pay attention to what the nasty voices say because…	**Not true for me (0)**	**A bit true for me (1)**	**Some what true for me (2)**	**Mostly true for me (3)**	**Totally true for me (4)**
1	They've worn me down, so I have to listen.					
2	Because I feel defeated by them.					
3	I feel low and my guard is down.					
4	I deserve the things they say.					
5	I don't believe in myself, so I get sucked into what they say.					
6	They are picking on my weak spots – things I'm already unsure about.					
7	What they are saying confirms that I really am a bad person.					
8	I don't have the confidence to question the nasty voices.					
9	I don't have the confidence to ignore the nasty voices.					
10	I don't have the confidence to ask for other people's opinions, so I only have the nasty voices to guide me.					
11	I don't have the confidence to trust my own mind.					
12	I'm tired so I can't think logically and end up believing them.					
13	I don't have the energy to do anything but listen to them.					
14	I don't have the mental energy to keep fighting what they say.					
15	I spend time by myself so there are no distractions from what they say.					

16	I spend time by myself so there's nothing else to listen to.					
17	I spend time by myself so I have time to listen to them.					
18	I spend time by myself so I can't check with other people whether I should believe the voices or not.					
	REASONS RELATED TO FEELING UNSAFE					
	I pay attention to what the nasty voices say because…	**Not true for me (0)**	**A bit true for me (1)**	**Some what true for me (2)**	**Mostly true for me (3)**	**Totally true for me (4)**
1	I'm so anxious that I can't do anything but listen.					
2	Otherwise they might catch me by surprise, and I'll panic.					
3	I want to be ready to deal with them.					
4	It will help me to prepare an escape from the voices' threats.					
5	I need to stand up for myself, so I fight them.					
6	I might be able to change their mind.					
7	What they are saying confirms that people really are out to get me.					
8	Because it's my responsibility to stop them hurting other people.					
9	I might be able to find a solution to the voices' anger or negativity.					
10	I don't want to let them win, so I listen to fight them.					
11	I feel suspicious of everyone, so I want to know what the voices are saying.					
12	It might help me understand them, so I can calm them down.					
	REASONS RELATED TO UNDERSTANDING VOICES					
	I pay attention to what the nasty voices say because…	**Not true for me (0)**	**A bit true for me (1)**	**Some what true for me (2)**	**Mostly true for me (3)**	**Totally true for me (4)**
1	It might help me work out who the voices are.					
2	It might help me understand what is happening.					

3	It might help me understand how I'm hearing voices when other people can't hear them.					
4	It might help me work out why they're picking on me.					
5	I want to know why they are talking to me.					
6	It might help to work out where they are coming from.					
7	It might help me work out what they could do to me.					
8	I want to work out what helps and what doesn't.					
9	The whole experience fascinates me.					
10	I'm trying to figure out why this is happening.					
11	I want to work out why they are saying these particular things.					

REASONS RELATED TO THE VOICES SOUND REAL

	I pay attention to what the nasty voices say because…	**Not true for me (0)**	**A bit true for me (1)**	**Some what true for me (2)**	**Mostly true for me (3)**	**Totally true for me (4)**
1	They sound so real.					
2	I'm not familiar with them yet so can't tune them out.					
3	They're unpredictable and come out of nowhere.					
4	Because other things in my life support what the voice says.					
5	I experience visions which back up what the voices say.					
6	I experience unusual smells which back up what the voices say.					
7	They sound so unusual or strange.					
8	They are just like real people.					
9	A second voice backs up the first voice.					

THE VOICES USE STRATEGIES THAT CAPTURE MY ATTENTION

	I pay attention to what the nasty voices say because…	**Not true for me (0)**	**A bit true for me (1)**	**Some what true for me (2)**	**Mostly true for me (3)**	**Totally true for me (4)**
1	If I don't listen they get louder.					
2	They keep repeating what they say to make me listen.					

3	They're intelligent and trick me into listening.					
4	They wait until I'm at my weakest before attacking me.					
5	They scare me with horrible sounds.					
6	They are putting on a performance for me.					
7	They are whispering (or very quiet) so I have to listen harder to hear what they are saying.					
8	They tell a convincing story that sucks you in to their world.					
9	They lull me into a false sense of security by saying nice things, so I start to trust them and listen to what they say.					
10	They sound unusual so they capture my attention.					
11	They say things about me that I wouldn't expect anyone else to know.					

REASONS RELATED TO HEARING THE VOICE OF SOMEONE I KNOW

	I pay attention to what the nasty voices say because…	**Not true for me (0)**	**A bit true for me (1)**	**Some what true for me (2)**	**Mostly true for me (3)**	**Totally true for me (4)**
1	I hear the voice of someone I know, and I usually believe that person so I'm more likely to be convinced by what they say.					
2	I hear the voice of someone I know, and I want to work out why they are saying horrible things when they are usually nice.					
3	I hear the voice of someone I know, and it sounds exactly the same as them, so it would be odd not to listen.					
4	I hear the voice of someone I know, and I don't trust them, so I need to keep listening.					

OTHER REASONS

	I pay attention to what the nasty voices say because…	**Not true for me (0)**	**A bit true for me (1)**	**Some what true for me (2)**	**Mostly true for me (3)**	**Totally true for me (4)**
1	I can also imagine what they look like and that makes me get sucked into what they're saying.					
2	It's a special talent to hear things that other people can't.					

3	Listening to voices is important to my spiritual or cultural beliefs.					
4	Listening will make me smart, because the voices are smart.					
5	I don't have the concentration to do anything else but listen.					
6	Even though they are nasty, they also give me a bit of company.					
7	Listening to the voice will help me to learn about myself.					
8	The voice knows more than I do so I might learn something.					
9	If I don't listen, they'll say nastier things.					

C. Listening and Believing – Assessment

Listening and believing - Assessment

Name _____

Date _____

Below are a range of statements about listening to and believing nasty voices. These are any voices which threaten you or put you down. Please *do not* consider positive voices, or neutral voices when completing this questionnaire, only those that are threatening or put you down.

Please rate the degree to which you agree with each statement, based on your experience over the past week.

ACTIVELY LISTENING TO NASTY VOICES					
		Never	A bit of the time	Most of the time	All the time
1	I want to keep listening to what the nasty voices have to say.	0	1	2	3
2	I want to hear what the nasty voices are saying when they start.	0	1	2	3
3	I listen hard to the nasty voices to make sure I've heard what they are saying.	0	1	2	3
4	I listen out for the nasty voices.	0	1	2	3

PASSIVELY LISTENING TO NASTY VOICES					
		Never	A bit of the time	Most of the time	All the time
5	There's nothing I can do but listen to what the nasty voices say.	0	1	2	3
6	When the nasty voices start it's almost impossible to ignore what they say.	0	1	2	3
7	I take in every word the nasty voices say.	0	1	2	3
8	I get sucked into the world of the nasty voices.	0	1	2	3

BELIEVING NASTY VOICES					
		Never	A bit of the time	Most of the time	All the time
9	I believe what the nasty voices say.	0	1	2	3
10	I have a gut feeling that what the nasty voices are saying is true.	0	1	2	3
11	The nasty voices are right in what they say.	0	1	2	3
12	I'm convinced what the nasty voices say is true.	0	1	2	3

DISREGARDING NASTY VOICES					
		Never	A bit of the time	Most of the time	All the time
13	When the nasty voices start, I find a way to ignore them.	0	1	2	3
14	I tune out the nasty voices.	0	1	2	3
15	I avoid getting sucked into the world of the nasty voices.	0	1	2	3
16	I just don't care what the nasty voices say.	0	1	2	3
17	What the nasty voices say doesn't matter to me.	0	1	2	3
18	I can brush off all the negative things that the nasty voices say.	0	1	2	3

D. Listening and Believing – Reasons (28 item full version)

Listening and believing – Reasons (L&B-R-28)

Name _____
Date _____

Below are a range of statements about why people listen to and believe nasty voices (voices which threaten you or put you down). Please *do not* consider positive voices, or neutral voices when completing this questionnaire, only those that are threatening or put you down.
Please rate the extent to which each statement describes your experience of hearing these voices over the past week.

LISTENING TO UNDERSTAND THEM, TO DEAL WITH THE THREAT						
		Not true for me	A bit true for me	Some what true for me	Mostly true for me	Totally true for me
I pay attention to what the nasty voices say because…						
1	I'm trying to figure out why this is happening.	0	1	2	3	4
2	It might help me work out who the voices are.	0	1	2	3	4
3	It might help me work out what they could do to me.	0	1	2	3	4
4	I want to be ready to deal with them.	0	1	2	3	4
5	I don't want to let them win, so I listen to fight them.	0	1	2	3	4

I LISTEN BECAUSE I'M WORN DOWN						
		Not true for me	A bit true for me	Some what true for me	Mostly true for me	Totally true for me
I pay attention to what the nasty voices say because…						
6	I don't have the confidence to ignore the nasty voices.	0	1	2	3	4
7	I don't have the confidence to trust my own mind.	0	1	2	3	4
8	They've worn me down, so I have to listen.	0	1	2	3	4
9	I feel defeated by them.	0	1	2	3	4
10	I'm so anxious that I can't do anything but listen.	0	1	2	3	4
11	I don't have the energy to do anything but listen to them.	0	1	2	3	4

I LISTEN TO THE NASTY VOICES BECAUSE I MIGHT LEARN SOMETHING HELPFUL						
		Not true for me	A bit true for me	Some what true for me	Mostly true for me	Totally true for me
I pay attention to what the nasty voices say because…						
12	Listening to the voice will help me to learn about myself.	0	1	2	3	4
13	The voice knows more than I do so I might learn something.	0	1	2	3	4
14	Listening will make me smart, because the voices are smart.	0	1	2	3	4
15	Listening to voices is important to my spiritual or cultural beliefs.	0	1	2	3	4

I SPEND TIME BY MYSELF SO I HAVE TIME AND SPACE TO LISTEN						
		Not true for me	A bit true for me	Some what true for me	Mostly true for me	Totally true for me
I pay attention to what the nasty voices say because…						
16	I spend time by myself so there's nothing else to listen to.	0	1	2	3	4
17	I spend time by myself so there are no distractions from what they say.	0	1	2	3	4
18	I spend time by myself so I have time to listen to them.	0	1	2	3	4

THE NASTY VOICES USE STRATEGIES TO CAPTURE MY ATTENTION						
		Not true for me	A bit true for me	Some what true for me	Mostly true for me	Totally true for me
I pay attention to what the nasty voices say because…						
19	They are putting on a performance for me.	0	1	2	3	4
20	They are whispering (or very quiet) so I have to listen harder to hear what they are saying.	0	1	2	3	4
21	They lull me into a false sense of security by saying nice things, so I start to trust them and listen to what they say.	0	1	2	3	4
22	They're intelligent and trick me into listening.	0	1	2	3	4
23	They tell a convincing story that sucks you in to their world.	0	1	2	3	4

THEY ARE JUST LIKE REAL PEOPLE						
		Not true for me	A bit true for me	Some what true for me	Mostly true for me	Totally true for me
I pay attention to what the nasty voices say because…						
24	They are just like real people.	0	1	2	3	4
25	They sound so real.	0	1	2	3	4
26	They're unpredictable and come out of nowhere.	0	1	2	3	4

I HEAR THE VOICE OF SOMEONE I KNOW						
		Not true for me	A bit true for me	Some what true for me	Mostly true for me	Totally true for me
I pay attention to what the nasty voices say because…						
27	I hear the voice of someone I know, and I want to work out why they are saying horrible things when they are usually nice.	0	1	2	3	4
28	I hear the voice of someone I know, and I usually believe that person so I'm more likely to be convinced by what they say.	0	1	2	3	4

E. Listening and Believing – Reasons (16 item short form version)

Listening and believing – Reasons (L&B-R-16)

Name _____
Date _____

Below are a range of statements about why people listen and believe nasty voices (voices which threaten you, or put you down). It's important that you *do not* consider positive voices, or neutral voices when completing this questionnaire, only those that are threatening or put you down.
Please rate the extent to which each statement describes your experience of hearing these voices over the past week.

		Not true for me	A bit true for me	Somewhat true for me	Mostly true for me	Totally true for me
I pay attention to what the nasty voices say because...						
1	It might help me work out who the voices are.	0	1	2	3	4
2	I spend time by myself so I have time to listen to them.	0	1	2	3	4
3	They sound so real.	0	1	2	3	4
4	I don't have the confidence to ignore the nasty voices.	0	1	2	3	4
5	They tell a convincing story that sucks you in to their world.	0	1	2	3	4

		Not true for me	A bit true for me	Somewhat true for me	Mostly true for me	Totally true for me
6	I'm trying to figure out why this is happening.	0	1	2	3	4
7	I'm so anxious that I can't do anything but listen.	0	1	2	3	4
8	It might help me work out what they could do to me.	0	1	2	3	4
9	They've worn me down, so I have to listen.	0	1	2	3	4
10	I don't have the confidence to trust my own mind.	0	1	2	3	4
11	Listening to the voice will help me to learn about myself.	0	1	2	3	4
12	They are just like real people.	0	1	2	3	4
13	They are whispering (or very quiet) so I have to listen harder to hear what they are saying.	0	1	2	3	4
14	The voice knows more than I do so I might learn something.	0	1	2	3	4

		Not true for me	A bit true for me	Somewhat true for me	Mostly true for me	Totally true for me
15	I spend time by myself so there's nothing else to listen to.	0	1	2	3	4
16	I feel defeated by them.	0	1	2	3	4

F. Listening and Believing – Reasons (5 item very brief version)

Listening and believing – Reasons (L&B-R-5)

Name _____
Date _____

Below are a range of statements about why people listen and believe nasty voices (voices which threaten you, or put you down). It's important that you *do not* consider positive voices, or neutral voices when completing this questionnaire, only those that are threatening or put you down.
Please rate the extent to which each statement describes your experience of hearing these voices over the past week.

	Not true for me	A bit true for me	Somewhat true for me	Mostly true for me	Totally true for me
I pay attention to what the nasty voices say because...					
I'm so anxious that I can't do anything but listen.	0	1	2	3	4
I'm trying to figure out why this is happening.	0	1	2	3	4
They sound so real.	0	1	2	3	4
The voice knows more than I do so I might learn something.	0	1	2	3	4
They tell a convincing story that sucks you in to their world.	0	1	2	3	4

G. Adapted version of the Lubben Social Network Scale

1	How many friends or relatives do you hear from at least once per month?	0	1	2	3-4	5-8	9 or more
2	How often do you see or hear from the friend or relative with whom you have the most contact?	Less than monthly	Monthly	Few times a month	Weekly	Few times a week	Daily
3	How many friends or relatives do you feel at ease with that you can talk about private matters?	0	1	2	3-4	5-8	9 or more
4	How many friends or relatives do you feel close to such that you could call on them for help?	0	1	2	3-4	5-8	9 or more
5	When one of your friends or relatives has an important decision to make, how often do they talk to you about it?	Never	Seldom	Sometimes	Often	Very often	Always
6	How often is one of your friends or relatives available for you to talk to when you have an important decision to make?	Never	Seldom	Sometimes	Often	Very often	Always

H. Audit trail of key analysis decisions (Chapter Four)

Point in the research	Considerations	Outcome
Protocol	Original aim related to this research, as stated in the protocol: To learn about the experience of engaging in a conversation whilst hearing an abusive voice(s) and how this may (or may not) impact on a therapeutic relationship.	Upon completion of the data collection it was clear that this question had relevance beyond just a therapeutic relationship. Hence the research question was amended to: 'To understand the experience of being around people whilst hearing derogatory and threatening voices.'
Initial coding was completed by BS concurrently to analysis reported in (Sheaves et al., 2020)	Codes from (Sheaves et al., 2020) considered relevant to this study: 1. Voices and social interactions. 2. Isolation. 3. Trust. 4. Paranoia. 5. Stigma. 6. Worry what other people think. 7. Advice for other voice hearers. 8. Advice for clinicians and therapy non-specifics. 9. Reality checking. 10. Things that helped.	Quotes related to the 10 codes (listed left) were pooled and read several times. A rough coding framework was generated specifically related to the experience of being around people whilst hearing DTVs: 1. Isolation and reduced social networks. 2. Don't talk to people about hearing voices. 3. Speaking to other people is hard (including 13 reasons why speaking is hard). 4. Speaking to other people is helpful (including six reasons why). 5. Speaking to people is OK (very few quotes).
Initial coding related to this research question	1. Decision re: whether to keep isolation and voice hearing as two separate constructs or describe the relationship between them.	1. The majority of quotes do not separate the two constructs. They therefore appear connected. Based on quotes the decision was made to create an overall theme of: a bidirectional relationship. Plan: to propose a bidirectional

		vicious cycle between social isolation and severity of DTVs to other team members.
Quotes second rated by EČ and discussed	Key discussion points: 1. Need to outline the experience of isolation in detail. Discussed quotes which fell into the following categories: withdrawal, turning away support, difficulty talking to people, not speaking about voice hearing. 2. Discussed exceptions to the bidirectional cycle, particularly where people trigger voices and how this should be conceptualised. 3. The issue of self-acceptance was highlighted as seeming important to two people's experience. 4. Discussion about the impact of voices on the dynamics of relationships. 5. 'We don't share common ground' was a sub-theme for reasons why it is difficult speaking to people. However this was felt not to capture the lack of 'shared reality' described by V1.	1. Isolation now described in detail. 2. The exceptions did not completely fit with the bidirectional framework. Hence framework should be discussed with supervisory team and LEAP to consider the best way to conceptualise. 3. To assess whether self-acceptance fits with other participants' descriptions. 4. Dynamics of relationship were negatively impacted, hence this was included under 'talking about voices might hurt or upset others'. 5. This was discussed and the consensus was to rename the code to: 'We don't share the same reality' and check with the LEAP.
Coding framework proposed to clinical academic supervisors	Key discussion points raised: 1. Supervisors wondered whether the relationship is best conceptualised as a bidirectional relationship between isolation and severity of DTVs, or rather whether the relationship is more complex and nuanced. 2. DF and LJ queried whether there is a better name to capture isolation given that it is not just isolation from people but also difficulties with being around people. 3. DF and LJ queried whether participants had shared experiences of re-engaging and how they had managed this.	1. To open a discussion with the LEAP about the nature of the relationship between isolation and voice hearing. 2. To change the term isolation to low social connectedness. 3. To go back to original transcripts to search specifically for any description relating to ways in which participants had shared experiences of re-engaging with people and how they had managed this.

Discussion with LEAP	1. The LEAP considered the term 'social connectedness' challenging to relate to particularly when negatively phrased (e.g. "low social connectedness led to …"). 2. The LEAP related very much to the sub-headings describing the reasons why speaking to people is hard. 3. The LEAP agreed that the management of social interactions is a challenge. Discussed issues of trust, taking a risk in talking to people, being invited to less events by other people. 4. The LEAP fed-back that the relationship between being around people and the severity of voice hearing was complicated and not simply a two way cycle. Being around people did not always make voice hearing better and there were instances in which they found that limiting interactions was helpful, and also that people can trigger a worsening of voices. But complete or long-term isolation was agreed to be unhelpful for voice hearing. 5. 'We don't share the same reality' code naming was checked. 6. Suggested looking specifically for instances where the transcripts discuss medical professionals. The LEAP shared examples where interacting with medical professionals had been a challenge.	1. The LEAP suggested 'social engagement' or 'social interactions' or 'socialising'. Social interactions was felt to not capture the withdrawal aspect of the quotes, and hence social engagement was chosen. 2. No actions needed. 3. Agreed it was important to create a code related to management of interactions and revisit the original transcripts to code for this. BS and the LEAP reflected on why this had not already emerged as a code and wondered if it was because some people were still struggling with interactions. The group wondered if there are two groups of participants: i) those that still find interactions a challenge and unhelpful for voice hearing and ii) those who find socialising a helpful coping strategy. 4. The LEAP and BS agreed on the following coding framework: 1: Reasons why interacting with people is difficult. 2. Why long-term isolation is not the best solution for voice hearing. 3. Ways of managing interactions. 4. The potential benefits for voice hearing. To revisit original transcripts and look intentionally for instances where people made voice hearing worse. 5. The LEAP agreed that the 'We don't share the same reality' code was appropriate. Several members related to that phrasing. 6. To create a code for 'medical professionals' and be alert to this when revisiting transcripts.
Coding transcripts with new coding framework	All transcripts were re-coded with the new coding framework. BS was particularly alert to any examples where participants had shared that i) being around people made the voices worse (coded as 'down sides to interacting') ii) instances where participants had discussed	Outcomes and decisions: 1. Medical professionals code included a diverse set of quotes which were double coded in other coding categories. Hence the decision was made to delete as a standalone code.

	interacting with medical professionals and iii) self-acceptance.	2. The 'management of social interactions' was as expected based on fewer participants. To be included in results, but with the limitation to be acknowledged in the discussion. 3. The 'potential benefits of social interactions for voice hearing' code was related to the 'why long-term isolation is not the best solution for voice hearing' code. There was significant double coding, hence the codes were merged and titled 'social interactions and the course of derogatory and threatening voices'. 4. 'Wider benefits' was a code that was under 'reasons why long-term isolation is not the solution' code. The quotes were diverse in nature, and with little details (and hence not deemed central to the individual's story), hence this has not been included in the results. 5. Code changed name: 'I'm fearful of the consequences of talking about the voices' changed to: 'The voices are listening to my conversation and there may be consequences from what I say' because there wasn't enough evidence from the data that it was necessarily fear based. Data used the phrase 'being under scrutiny' and 'difficult' but not necessarily feeling scared. 6. 'I isolate myself because social interactions can trigger negative emotions that make voices worse' changed from 'can trigger voice hearing' because the quotes describe negative affect as a mechanism. Paranoia triggering voice hearing was later merged with this code, and instances where people directly triggered voice hearing. Hence, code renamed: 'being around people can make derogatory and threatening voices worse'. 7. 'Down sides to interacting' was double coded with quotes which also fell under 'reasons why interacting with people is difficult'. Whilst a helpful process to intentionally search for negative experiences of interacting, following the LEAP feedback, it in fact validated the fact that the quotes had already been captured under different headings and was hence deleted as a separate code. 8. 'voices can make me difficult to be around' has overlap with 'I might respond to the voices' so codes merged. 9. Social engagement within the analysis sometimes read as if it was referring to one event. Hence after consultation with DF and LJ social connection was

	chosen (rather than connectedness which was initially questioned by the LEAP) and agreed with the LEAP upon reviewing the manuscript.

I. Published papers

Behavioural and Cognitive Psychotherapy, 2020, page 1 of 15
doi:10.1017/S1352465820000429

BABCP
www.babcp.com

MAIN

Why do patients with psychosis listen to and believe derogatory and threatening voices? 21 reasons given by patients

Bryony Sheaves[1,2,*], Louise Johns[1,2], Laura Griffith[3], Louise Isham[1,2], The McPin Hearing Voices Lived Experience Advisory Panel[4], Thomas Kabir[5] and Daniel Freeman[1,2]

[1]Department of Psychiatry, University of Oxford, Oxford, UK, [2]Oxford Health NHS Foundation Trust, Oxford, UK, [3]Public Health England, Birmingham, UK, [4]The McPin Foundation, London, UK; the group were: P. Mirrow, T. Oberai, P. Green and A. Fletcher and [5]The McPin Foundation, London, UK
*Corresponding author. Email: bryony.sheaves@psych.ox.ac.uk

(Received 6 September 2019; revised 11 May 2020; accepted 22 May 2020)

Abstract

Background: Around two-thirds of patients with auditory hallucinations experience derogatory and threatening voices (DTVs). Understandably, when these voices are believed then common consequences can be depression, anxiety and suicidal ideation. There is a need for treatment targeted at promoting distance from such voice content. The first step in this treatment development is to understand why patients listen to and believe voices that are appraised as malevolent.
Aims: To learn from patients their reasons for listening to and believing DTVs.
Method: Theoretical sampling was used to recruit 15 participants with non-affective psychosis from NHS services who heard daily DTVs. Data were obtained by semi-structured interviews and analysed using grounded theory.
Results: Six higher-order categories for why patients listen and/or believe voices were theorised. These were: (i) to understand the voices (e.g. what is their motive?); (ii) to be alert to the threat (e.g. prepared for what might happen); (iii) a normal instinct to rely on sensory information; (iv) the voices can be of people they know; (v) the DTVs use strategies (e.g. repetition) to capture attention; and (vi) patients feel so worn down it is hard to resist the voice experience (e.g. too mentally defeated to dismiss comments). In total, 21 reasons were identified, with all participants endorsing multiple reasons.
Conclusions: The study generated a wide range of reasons why patients listen to and believe DTVs. Awareness of these reasons can help clinicians understand the patient experience and also identify targets in psychological intervention.

Keywords: attention; derogatory and threatening voices; psychosis; schizophrenia; voice-hearing

Introduction

> '*The voices had me believing that I wouldn't be waking up in the morning. And um they said they were going to skin me um, rape me, all this horrible stuff*' [voice hearer, V13]

Since the seminal paper by Chadwick and Birchwood (1994) over 25 years ago, substantial literature has amassed demonstrating that how voice hearers appraise voices affects both the degree of distress and the response (Birchwood and Chadwick, 1997; Chadwick and Birchwood, 1995; Peters *et al.*, 2012; Varese *et al.*, 2016). Targeting these appraisals using

© British Association for Behavioural and Cognitive Psychotherapies 2020. This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted re-use, distribution, and reproduction in any medium, provided the original work is properly cited.

Table 1. Definitions of derogatory and threatening voices (DTVs) with illustrative examples

Term	Sub-type	Definition	Examples
Derogatory voices	Critical content	Voice(s) that make direct criticisms of the individual's self-concept	'*telling me things like I'm worthless and you know, you don't deserve to be here*' (V10) '*you are evil* [. . .] *you are possessed, all sorts of things*' (V5)
	Negative perceptions from other people	Voice(s) which tell the person that they are viewed negatively by other people	'*everybody else hates you and they don't need you and they think the worst of you. And um, just that you are you know just a complete disappointment*' (V9) '*I am this bitch and I am this ridiculous witch*' (V4)
Threatening voices	Voice is the perpetrator	Threats made by the voice(s) that they intend harm to the person, or those around them	'*they have started swearing at me um, threatening to cut my hands off, threatening to er take me away and bury me in a field*' (V15) '*they were on about my neighbour that lives upstairs and* [cough]. *And they said they were going to hurt the kids and so, I ran up the stairs*' (V13)
	Family, friends or other specific perpetrator	Voice(s) telling the person that they will be harmed by people already known to them. This may also include harm to people around them	'*they encouraged me to think that my mother and her husband and some of my friends were all, all kind of serial killers*' (V1) '*"I am coming to get you" is the was main thing that they said*' (V8, who heard the voice of a family friend)
	Unknown or no specific perpetrator	Voice(s) telling the person that they will be harmed, but no particular individual is identified, or the perpetrator is not someone known to them. This may also include harm to people around them	'*people are going to get me when I least expect it*' (V6) '*I was hearing everywhere I went, people saying oh . . . "um they are going to cut out his right eye and show it to his left eye", things like really brutal things*' (V3)

Note that participants may endorse more than one sub-type of DTV.

cognitive behavioural therapy leads to clinical benefits on hallucinations (Turner *et al.*, 2020). Building on this literature, and the development of targeted treatments for voice hearing (Birchwood *et al.*, 2014; Birchwood *et al.*, 2018), we aimed to improve the cognitive understanding of one particular presentation of voices that has not been systematically investigated: derogatory and threatening voices (DTVs).

Around two-thirds of voices are derogatory or threatening to the patient (McCarthy-Jones *et al.*, 2014; Nayani and David, 1996; see Table 1 for definition and examples). Voice hearers most often describe these voices as seeming very real (McCarthy-Jones *et al.*, 2014), believable, and difficult to ignore. It is therefore understandable that depression, anxiety and suicidal ideation are common consequences. This paper seeks to identify appraisals which result in listening to and believing derogatory and threatening voice content. A crucial first step in this process is to listen and learn from the people who have this voice experience.

Method

Participants

A pilot stage, early in sampling, ensured specific diversity based on the following characteristics: age, duration of hearing voices and employment status. In-patient or out-patient status was also a characteristic; however, it proved difficult to identify in-patients who felt able to talk about their

voice hearing. Subsequently, theoretical sampling was used to recruit participants who hear DTVs. Interviews were analysed concurrently with recruitment such that subsequent sampling was driven by the emerging theory and testing of it. A maximum of 20 participants was sought, but theoretical saturation (Corbin and Strauss, 2015) was felt to have been reached by 15 participants and hence recruitment ceased. Theoretical saturation was defined as no new reasons for listening to or believing voices emerging from the data, and that each reason was sufficiently saturated and elaborated.

Participants were recruited from Oxford Health NHS Foundation Trust. Clinical teams referred patients to author B.S. who completed a telephone screening with the referrer and the potential participant. Inclusion criteria were: daily experience (either current or past) of DTVs; experience of DTVs for at least 3 months; a willingness and ability to recall and discuss their experience in detail; fluent in English; age 18–65 years; willingness and ability to provide informed consent. Exclusion criteria were: moderate to severe learning disability; voices caused by an organic syndrome (e.g. dementia, significant head injury) and voices occurring solely within the context of substance misuse, personality disorder or a mood episode (depression or mania). See Supplementary material section A for further detail on methods.

Procedure

The study was approved by an NHS research ethics committee (reference no. 18/SC/0443). An audio-recorded semi-structured interview was conducted using a topic guide by B.S. The interview intended to generate the participants' own detailed description of their experience rather than merely responding to closed questions. The audio-recordings were transcribed verbatim by an external transcription company. For the interview process and topic guide, see Supplementary material section B. L.G. (a qualitative methodologist) consulted on the protocol, topic guide, emerging categories from an early interview and the subsequent coding framework.

Analysis

A grounded theory methodology (Glaser and Strauss, 1967) was used as it is intended to generate a theory about a complex process about which little is already known. NVivo 12 (QSR International Pty Ltd, 2018) facilitated coding. Free coding was used with the first three transcripts in order to generate an initial coding framework. The framework focused on psychological variables (beliefs, emotion and behavioural responses) alongside other pertinent descriptions of experience derived from the data (e.g. isolation, suicidal thoughts). A research diary was completed logging decisions in the theory generation, theoretical sampling and analysis. This ensured transparency in the iterative process. A second clinical psychologist who specialises in psychosis research acted as a second rater for one interview, using the framework generated by B.S. in order to enhance credibility of ratings. The coding framework and illustrative quotes were presented to a lived experience advisory panel (LEAP) who relabelled some of the codes and confirmed the appropriateness of the overall framework. This framework was subsequently applied to later interviews using the constant comparison method. New codes were added as they emerged, and all interviews were subsequently re-coded to enhance dependability. Finally, the results were discussed with the LEAP who confirmed the overall structure of the results, and either confirmed the appropriateness of each code, or adjusted the name after discussion with B.S.

Results

Fifteen participants were recruited. Table 1 shows analysis of the sub-types of DTV content that is listened to and believed. Table 2 provides demographic and clinical characteristics.

Table 2. Demographics and clinical characteristics ($n = 15$)

Demographic or clinical characteristic		Frequency
Age		
	≤20 years	1
	21–30 years	3
	31–40 years	5
	41–50 years	5
	51–60 years	1
Ethnicity		
	White British	13
	Chinese	1
	Black British	1
Gender		
	Male	11
	Female	4
Marital status		
	Single	11
	Married/civil partnership	3
	Divorced	1
Employment status		
	Unemployed	10
	Employed (part-time)	2
	Other	3
Accommodation status		
	Lives alone	6
	Lives with parents	6
	Lives with partner/spouse	2
	Supported accommodation	1
Diagnosis		
	Schizophrenia	10
	Schizoaffective disorder	1
	Psychosis not otherwise specified	4
Current voice hearing status		
	Current difficulty dismissing or ignoring DTVs	7
	Can dismiss or ignore DTVs at least some of the time	4
	Can dismiss or ignore majority of DTVs	2
	Can dismiss or ignore all DTVs	1
	Currently does not hear DTVs	1
Age of onset of voice hearing		
	≤15 years	4
	16–25 years	7
	26–35 years	2
	36–45 years	1
	46–55 years	1
Duration of voice hearing		
	1–5 years	5
	6–10 years	0
	11–15 years	3
	16–20 years	4
	21–25 years	2
	26–30 years	1

The impact of derogatory and threatening voices

Participants described severe anxiety (e.g. '*it's a scary, scary, scary, scary situation, I've had more fear in the last two years* [pause] *than anywhere in my life*', V15), depression (e.g. '*when the torture starts* [. . .] *I will feel so depressed I'm just in bed*', V4) and anger (e.g. '*I haven't had any kind of aggressive outbursts in terms of towards anybody else in the real world, but I've most definitely been aggressive towards the things in my mind*', V1). Isolation was a prominent theme (e.g. '*it's a pretty lonely place*', V15). Every participant described self-harm, suicidal ideation or attempts, despite

not being directly asked about it (e.g. '*the only thing I would do or felt I was able to do when I heard voices was to hurt myself and that's the only way I could get it to stop*', V10).

Reasons for listening to and believing derogatory and threatening voices

Six higher-order categories were derived. Within these higher-order categories were 21 reasons for listening to and believing DTVs (see Table 3). Each participant endorsed between three and nine reasons.

Desire to understand the voices

V2: '*If it killed me it didn't matter, I just wanted to know what was happening*'.

Participants described a range of questions (who, why, what, how and where) which served as reasons for listening to distressing content.

Who is it? Where is it coming from?

Several participants described keeping DTVs in their attention to work out who the voice was, for example '*when I'm around people that's where I struggle with it feeling so real. I will look around, I will try and work out who is saying it, why they are saying it, I don't understand, what have I done?*' (V5). For V12, identifying the culprit was important to assess their ability to harm: '*Because I don't know who they are, what they represent, what they could do to me*'. Identifying the location of voices served as another reason for focusing on them: '*I just don't understand where it's coming from. It's frustrating*' (V15). V2 explained that if he can see where the sound is coming from it is easier to ignore: '*that's the difference you know if you sit here calling me a paedophile and a cunt and everything . . . . No, that's not just the difference, the difference is that I can see you saying it*'.

What is their motive?

Many participants described wanting to identify the intention of the voice or work out why particular threats or derogatory remarks were made. For V13 this was associated with arguing with the voices: '*I just don't understand why they are doing it. I just can't understand, some of the things they say, I argue with them every night*'.

What is happening?

Several participants were trying to understand why they were experiencing DTVs and did not have an adequate explanation, for example '*. . . didn't really know that much about um about hearing voices so, I sort of just believed it*' (V3). V6 read a psychology textbook to learn about his condition and explained '*it helped me not to believe in them so much*'. V5 described how a friend shared a rationale for the DTVs which helped her question them on a bad day: '*I reckon she was on and off the end of the phone for a good couple of hours before I realised okay, maybe she is right, I'm really tired, I'm really low, I'm really agitated. This is probably because of the muck up with my meds . . . So, when she talked me down I started to be able to rationalise things*'. Explanations for DTVs that had been shared with participants by professionals were not always sufficient. V15 described: '*I mean why would my brain tell me that I'm a paedophile when I'm not?*', and V3 explained that his diagnosis was helpful for questioning the DTVs, but only after some time: '*I had been told by that psychologist that I had psychosis and even if I didn't believe her I still had that in my head so*'.

Table 3. Category structure of reasons for listening to and believing DTVs

Core category	Higher-order category	Reason for listening to and believing DTVs	Illustrative quotes
Reasons for listening to and believing DTVs	To understand the voices	Who is it? Where is it coming from?	'*I think for me because I was always trying to work out who it was, so any trait in the voice or any, any slip up they made or anything like that I would be trying to figure it out*' (V2)
			'*When I am in situations when I'm around people that's where I struggle with it feeling so real. I will look around, I will try and work out who is saying it, why they are saying it, I don't understand, what have I done?*' (V5)
		What is their motive?	'*I became just really um transfixed with all these different voices like talking about me and I couldn't really understand why they were talking about me*' (V3)
		What is happening?	'*There's only so much you can really um, I don't know there's only so much you can question, so much you can question it. Because at that point I had never used antipsychotic medication, didn't really know that much about um about hearing voices so, I sort of just believed it*' (V3)
			'*Um, and yeah you sort of, you do question it and think well, why would that happen to me of all people?*' (V9)
	To be alert for the threat	To be prepared for what the voices might do	'*I didn't want to hear the voices* [but] *I did at the same time because I thought I could get something out of it about where he was going to be and I could not be there*' (V8)
			'*I have to listen to this because I need to know what they are going to, planning to do to me so I can be prepared*'
		I listen to negotiate with the voices	'*I thought that they were similar to me and they were just like human beings that could kind of be persuaded round to a more pleasant way of being*' (V1)
			'*I would like bargain with them, like if I do it more or if I do it better will you make sure something bad doesn't happen to me?*' (V8)
		I listen so I can fight the voices	'*I just thought like fight or flight I just thought I am going to fight these voices, I am not going to allow them to win*' (V7)
			V10: '*Telling them to fuck off*' Interviewer: '*what happened to the voices when you tried to say that?*' V10: '*Getting worse, they were arguing with me*'
		I listen to stop the voices harming other people	'*it's almost like they warned me, and I have gone yeah, whatever, that's not going to happen. If it did happen how would I cope with that? . . . you are never going to forgive yourself*' (V5)
			'*And they said they were going to hurt the kids and so, I ran up the stairs about five times, knocked on her door to make sure she was alright*' (V13)
		I listen because I'm scared about the consequences	'*I especially worry about the supernatural. You do listen because you never know quite what they could do*' (V12)
			'*I found it difficult because you would be kind of scared of the reaction or scared of what else might be said or what else you might be told to do um*' (V9)
	Because my instinct is to rely on my senses	Because they sound so real, why would you question it?	'*They were convincing because they were as audible as you are now and that's all you need*' (V2)
			'*I didn't realise that it wasn't, I didn't realise it wasn't real and that it didn't, you know it was my illness, I didn't know I was ill, I thought that was the way it was*' (V7)

(*Continued*)

Table 3. (*Continued*)

Core category	Higher-order category	Reason for listening to and believing DTVs	Illustrative quotes
		And other anomalous experiences support the voice	'*Just because I feel they, I feel just pain in my, in my stomach area. With, so like what they are saying registers whether I like it or not*' (V12) '*it's like they have this electronic weapon that can be used on me, my head, it goes it's indescribable but it's horrible. Sometimes I just feel like my head was, it can be so bad that it hurts so much*' (V4)
		And I don't have enough evidence to dispute the voices yet	Interviewer: '*do you have any sense of … why it is that they seemed more believable before?*' V6: '*just time again I think … Sort of got used to it, nothing has happened*' '*I just thought I, I didn't know, I accepted that they are real things and they exist in another plane*' (V12)
		And other evidence supports that the voice or what it's saying is real	'*And so the fact that kind of the things I would hear like would match up to something I would see which would then match up to like my belief … when you are trying to make sense of something you see these little connections everywhere*' (V8) '*Almost all the things I would see would have some significance and relate back to the* [persecutory voice]' (V2)
	Because I hear the voice of people I know		*I almost hear it in the voice that I'm used to them using, I think, I think I find it harder to rationalise than say if it was a stranger in a cafe because I don't know their voice from Adam*' (V5) '*when it's family there's um probably about 100% um there's 100% on top*' (V14)
	Because the DTVs use strategies to capture my attention	They use calm, clever or calculated tactics to get my attention	'*It draws you in, it draws you in, they say things that make you want to listen … you don't want to listen to them, but you don't feel like you have a choice*' (V13) '*they try and be a bit sly and clever about it and it completely, it completely like doesn't upset me but it's like I have to think about it. Like, sometimes they disappear and I'm still, still thinking about it if that makes sense*' (V10)
		They shout, scream, or make sinister noises to get my attention	'*the real shrill screaming, because obviously that's going to get anyone's attention, a real shrill scream that sounds like someone is stood right in in your face*' (V9) '*their voices got louder, it wasn't that easy to ignore them*' (V4)
		Because they are constant or repetitive so I have to listen	'*And I think to myself why are you listening, it's not worth listening to. But obviously that's easier said than done if you … had constant noise and voices for like two, three, four, five days*' (V9) '*When something is … shoved down your throat all the time it's just … I'm pretty sure … you could beat any of the strongest people down by you know making them solitary and then keep telling them something until they believed it*' (V2)

(*Continued*)

Table 3. (*Continued*)

Core category	Higher-order category	Reason for listening to and believing DTVs	Illustrative quotes
	Because I'm worn down	Because I'm tired and don't have the energy to ignore them	'*when I am tired … I can't use the normal part of my brain* [laughing] *to go is this the illness or is this real?*' (V5)
			'*it's like you have been through a few rounds with a boxer* [after a nightmare] *and you are like recovering and you are in recovery mode almost*' (V14)
		Because I'm lacking the confidence to dismiss them	'*I don't know sometimes if I am in a strong place and I, they don't affect me as badly as other times. But then if I'm down and out and I am feeling particularly weak and vulnerable it's like that's when they will attack*' (V7)
			'*confidence to um, to believe in um my mind a little bit maybe rather than the voices*' (V6)
		Because they are confirming or embellishing my pre-existing concerns	'*the worries … are fuel for the voices to then add in. And like chip in their part to kind of make it worse or um turn it into something even more ridiculous*' (V9)
			'*if the belief was less then I would, I wouldn't give the voices so much time or anything*' (V8)
		Because I'm isolated and lack other distractors	'*If I am busy I haven't got time to think about it, I don't have time to listen*' (V9)
			'*it becomes monotonous. Your brain is going to look for something of interest at some point, it's going to start inventing things because you get up, you watch TV, you go to the toilet, you watch TV, you go to bed you don't do anything. Do that for five years you will lose your mind*' (V15)
		I listen because I feel defeated by them	'*every day I was trying to battle the thing I couldn't win*' (V8)
			'*it's like Guerrilla warfare where they are like you know, they are waiting until I am down and out and vulnerable, weak, and then they will attack and then go again*' (V7)

To be alert for the threat

To be prepared for what the voices might do

A few participants noted listening to threatening voices in order to be prepared for voices' threat, e.g. '*I've got to listen to this because I need to know what they are* [. . .] *planning to do to me so I can be prepared*' (V15). This led to precautionary strategies and escape plans, for example '*I make sure there's no weapons lying around that they can get at, but I certainly know where things are that I can pick up*' (V15) and '*my life was in jeopardy, so I acted on trying to find a safer place*' (V1).

To negotiate with the voices

Several participants described listening in order to reason with DTVs. This was pertinent for V1 who had tried persuasion '*kind of persuade them to be nicer*' and doing things to change the voices '*from* [. . .] *playing music to kind of preaching about* [. . .] *the awesomeness of existence*'. V5 tried using logic: '*I would be like "that's ridiculous that's not even logical, like I know they are not in* [London] *. . . So, how do you propose that you are going to do that there?*"'. V8 tried to please the voices '*I would like bargain with them, like if I do it more or if I do it better will you make sure something bad doesn't happen to me?*' but did not negotiate with the most threatening voice '*the main* [voice] *I don't think I ever bargained, I think I was so scared that I would just sit and, I don't think there was any point in bargaining*'. Several participants noted reasons for not attempting to negotiate with DTVs (see Supplementary material section C).

Because I'm fighting them

The majority of participants described confronting the DTVs. They did not explicitly state that they listened in order to engage in a fight, but this is implied in the descriptions, for example: '*I was just taking them on, I was like I'm not having this anymore . . . you are not going to rule over me all the time*' (V7). For some, a physical confrontation '*okay, let's go outside*' (V15), a mental argument '*I've definitely been aggressive to the things in my mind*' (V1) or more passive strategies '*I don't need to fight back . . . I can just annoy them with cigarettes and alcohol*' (V12) were described. Reasons for fighting with voices are outlined in Supplementary material section C.

Because it's my responsibility to stop them harming others

A few participants described feeling responsible for stopping DTVs harming others and this provided a rationale for engaging with them, for example '*it's almost like they warned me, and I have gone yeah, whatever, that's not going to happen. If it did happen how would I cope with that? . . . you are never going to forgive yourself*' (V5).

Because I'm scared about the consequences

Several participants noted being scared of the consequences of not listening to the voices, or doing what they say '*Oh, they will screw me more*' (V4). For some, there was a fear of voices getting worse: '*I found it difficult because you would be* [. . .] *scared of the reaction or scared of what else might be said*' (V9), or there being negative consequences after death (see Table 3, V12). One participant who did not listen to or believe his voices noted '[If] *I dismiss something negative I'm not concerned that something negative will come out*' (V11) and two participants noted learning over time how to manage this fear: '*if I tolerate it and try and keep going there's less kind of retaliation from the noise and from the voices there*' (V9).

Because my instinct is to rely on my senses

Because they sound so real, why would you question it?

Several participants described initially accepting that the voices were real: '*I didn't realise it wasn't real and that … it was my illness, I didn't know I was ill, I thought that was the way it was*' (V7). V3 explained away why others were not hearing what he heard: '*I thought that I had like superior hearing to other people* [. . .] *because I was hearing these things that other people weren't*'.

Other anomalous experiences support the voice

A few participants reported tactile hallucinations linked to their voice hearing. V4 described this as '*torture*' explaining: '*they have this electronic weapon that can be used on me, my head . . . it's indescribable but it's horrible*'. This directly linked to her listening to the DTVs: '*you try to ignore him and that, that's not acceptable to him. And he beats you up to force you to hear*'. Some participants described visual hallucinations at the time of hearing voices: V5: '*they were telling me that like a woman was coming with a gun,* [. . .] *she would find a way to shoot me … I laid on my bed like battling about it and then I looked up and like in the doorway … she was just stood there*'. A few participants described olfactory hallucinations which kept the DTVs in attentional focus. V5 described this as an early indicator of relapse: '*I know I'm getting ill because one of the first things is everything starts smelling chemical … like as I'm smelling things they will be telling me that people are going to poison me*'.

V8 experienced nightmares depicting the threats made by her DTV. Dreaming about being captured by the DTV made the voice's threats more compelling: '*Like, the dreams felt very real*'. Several participants noted that acute fear from nightmares exacerbated voices. For V1 it triggered an acute episode of DTVs: '*… the second time it was basically coming from the back of a very nasty experience in a dream*'. V14 explained that he is less active the day after experiencing nightmares which means there are fewer distractions from the DTVs: '*it's like you have been through a few rounds with a boxer and you are like recovering and you are in recovery mode almost*'.

Because I don't have enough evidence to dispute the voices

Several participants who had experienced DTVs for several years noted initially believing them: '*Well, it's been so long and the thing that I've been thinking you know … none of the things that I was thinking about have actually occurred . . .*' (V1). For V6 both habituation ('*I got used to it*') and evidence gathering ('*nothing has happened*') enabled him to believe them less. Evidence was helpful for resisting demands: '*since I was what 13, 14 so sort of 20 years, they have told me things are going to happen and they never have … Whether I've done it or not the things have never happened*' (V5) and improving mood: '*it's been a couple of years now … nothing particularly bad has happened and I can* [pause] *find a lot more peace … So, I'm quite, happier really, but they are still there*' (V12). Not all participants, however, noted a change over time: '*I don't think it has, just the same*' (V11).

Because other evidence supports that the voice and/or what it's saying is real

Many participants described evidence which supported the veracity of what the DTVs said, or that they are real entities. V1 found the voice content difficult to comprehend but considered '*the second world war. And you think well, those people were totally evil, they would be thinking the same kind of things in terms of murdering anything they didn't like*'. He also felt victimised whilst playing a computer game and thought '*Maybe you are a victim in some kind of way … so that was kind of reinforcing the kind of thinking that it's all a reality in terms of having real people in my mind*'. V5 described concrete evidence that people she knew were

DTVs: '*if you were to say something at the same time and I saw your mouth moving as they said it I might think it was you. And it's happened, like with my mum it happens quite a lot*'. Some participants described a confirmatory bias: '*Almost all the things I would see would have some significance and relate back to the* [DTV]' (V8).

Because I hear the voice of someone I know

A number of participants described hearing the voice of family members, friends, ex-friends, famous people and other people they had met momentarily which made DTVs more difficult to question or ignore. For some, the voice content was congruent with what was known about the person '*they are doing exactly what they did when I fell out with them*' (V13) and for others it was incongruent '*technically you would think I should go "well, I know them, they wouldn't say that"*' (V5). Four participants commented that hearing a voice of someone familiar was more difficult: '*when it's family there's um probably about 100% um there's 100% on top*' (V14).

There were a range of reasons why these were more difficult to ignore, including: '*it's one of the voices that you trust more than anything*' (V14), because the voice content could reflect an already difficult relationship '*with in laws . . . you don't know what they think about you*' (V2), because of prior experience of the person's intentions '*I think they are just trying to finish the job*' (V13), because the person is used to listening to that voice '*I hear them in the voice that I'm used to them using*' (V5), because hearing a famous person can lead you to '*get immersed in it like you are almost famous*' (V14), and simply because they exist '*this guy must be real, it must be the guy that I saw two months ago . . . because it's his voice I've been hearing*' (V3). One participant conversely found that if he heard voices of people he recognised they were easier to dismiss than other voices '*the ones that are people I know they are the ones I can, I can sort of rationalise if you like: "well this is ridiculous . . . there's no way I can hear your thoughts"*' (V7).

Because the DTVs use communication strategies that capture attention

Because the voices use calm, clever or calculated tactics

Participants described a range of ways that the DTVs are '*calm and calculated in what they say*' (V10) and that this captured attention. This was central for V10 who described that DTVs were captivating because: (1) they were quieter and easier to listen to than angry ones because '*it's not as scary I suppose*' and (2) they intentionally say things to provoke intrigue '*because sometimes I don't understand it like and it makes me think about what they are saying . . . maybe that's why they are doing it*'. Four other participants described finding that when voices are quiet or whisper, this encourages listening, for example: '*the quieter they get the more . . . I find myself trying to really listen to it*' (V5). However, V5's reason for listening was different from V10's: '*I guess the louder they are the more clearly, I know what's being said . . . and can rationalise what's being said*'. For V13 this whispering was an intentional tactic: '*because the sound, it makes you want to listen, the voices, the voices do it as well and it just makes you want to listen to them*'. DTVs provoking intrigue was also described by others. They triggered forgotten memories '*the memories like, when they say things from the past and that, things you had forgotten like and you remember it. Sort of grabs your attention*' (V13), had unexpected knowledge '*it's things . . . you just think people shouldn't know about you*' (V3), and asked questions '*they're going "oh, hasn't he worked it out yet?" . . . so I'm thinking, what haven't I worked out?*' (V15). For one person it was the intelligence of the DTV: '*you hear something intelligent back you tend to be more alert, your ears prick up a bit*' (V14).

Because the voices shout, scream or make sinister noises

Several participants noted '*the voices got louder, it wasn't that easy to ignore them*' (V4). For others it was their manner as well as volume: '*a real sick, sick kind of manner*' (V1). For V9 a noise served as a means of the DTV capturing attention: '*when the voices have got your attention that's when the conversation can kind of start … like the derogatory and the violent comments*'. She noted that some noises she has habituated to over time '*it's not as effective as it used to be, it's been going on for so long*', but this hasn't happened with other noises '*I get like a sinister laugh which I still get like even to this day. That's probably the only thing now that would get my attention more because it's quite unnerving*' and because this noise is uncomfortable: '*I'm almost listening for it*'.

Because they are constant or repetitive

Several participants noted listening to or believing voices because they are constant, or repeat what they say, e.g. '*And I think to myself why are you listening, it's not worth listening to. But obviously that's easier said than done if you* [. . .] *had constant noise and voices for like two, three, four, five days*' (V9).

Because I'm worn down

Because I'm tired and don't have the energy to ignore them

All participants reported disturbed sleep or energy levels. Many participants reported sleep disruption leading to voices being more difficult to ignore. One participant explained '*Yeah, it's not so much the voices are any different to any other day it's my ability to rationalise them*' (V5), whereas another said that they have less control '*when I haven't slept that's, that's when I struggle to, to even like er, I struggle to like even make them stop*' (V10) and V13 described that sleep disruption led to the DTVs becoming louder: '*They would be a lot louder and I would hear them more*'.

Because I'm lacking self confidence

Almost all participants described difficulties with self-confidence. A few noted that their own lack of physical strength meant that an attack from the voices would be more likely to succeed: '*I don't have the strength or physical ability to defend myself* [. . .] *and it is kind of compounded the fear factor*' (V1). Others noted that voices intentionally targeted them when they were vulnerable (V7, Table 3) and the content embellishes pre-existing concerns: '*I'm feeling stupid or I'm feeling overweight or whatever and* [. . .] *that's what I will hear*' (V7). For others, confidence was required in order to test whether the DTVs were real; for example, V6 was asked what prompted him to ask friends '*did you just say that?*' and explained '*Maybe I sort of got a bit more self-confident*'. He also noted that this questioning relies on the '*confidence … to believe in um my mind a little bit maybe rather than the voices*'. For V14, a low opinion of his intelligence impacted on his perception that he could rationalise the voices '*not intelligent enough to*' and his desire to seek psychological therapy '*if I ever started talking it wouldn't be anything constructive, or anything good, or anything valuable coming out of my mouth*'.

Because the voices are confirming or embellishing pre-existing concerns

Several participants described DTVs confirming, exaggerating or embellishing pre-existing concerns. V9 explained '*I would panic people would get in the house. And then obviously the voices would kick in and say someone is going to be in the house, someone is going to take this, people are going to do this . . .*'. For some participants their primary problem appeared to be paranoia (V8: '*if the belief was less then* [. . .], *I wouldn't give the voices so much time*'). For

others their low mood and associated negative thoughts made them more inclined to believe derogatory remarks: '*I mean I suffer from depression … you have always got that thing in the back of your mind that you are* [. . .] *no good, a no-good character*' (V14).

Because of isolation and lack of mental stimulation

Inactivity and lack of stimulation was common, e.g. '*not going outside at all for a month*' (V3) and provided time to listen to the voices: '*If I'm busy I haven't got time to think about it, I don't have time to listen*' (V9). Night-time was problematic because of the quiet and lack of distraction: '*it's so quiet and everything is still and you listen because you hear more. And it's almost like sometimes you lay there waiting to hear it*' (V9). For some participants, being busy was also an opportunity to gain new information: '*it gives you another out, another perspective on a day rather than spending it cooped up in your flat thinking*' (V14).

Because I give up, I'm defeated by them

Participants frequently described managing the voices as an ongoing battle: '*every day I was trying to battle the thing I couldn't win*' (V8). Given the persistent nature of the voices, however, nine participants described listening because they felt defeated by them. For some, this directly led to times of vulnerability for attacks from the voices: '*it's like Guerrilla warfare where* [. . .], *they are waiting until I'm down and out and vulnerable, weak, and then they will attack*' (V7) and feelings of suicidal ideation '*the worst thing is to feel that self-destructive sort of "oh, I've got a solution for all this, I will just end it"*' (V7). Conversely, however, one participant described his ability to not listen to the voices as resulting from mental strength. When asked how he could ignore the voices, he explained: '*it's just from mental strength … having a strong mind, being sure of yourself*' (V11).

Discussion

This study identified 21 reasons for listening to and believing derogatory and threatening voices from patient interviews. Reasons were diverse and included aspects related to the self (e.g. emotional state, self-confidence), to the voice itself (e.g. its identity and the acoustic experience) as well as an overall drive to understand the experience. Whilst some reasons have been previously identified as important aspects of the voice-hearing experience, for example voice identity (Chadwick and Birchwood, 1994), acoustic properties (McCarthy-Jones *et al*., 2014; Moritz and Larøi, 2008; Nayani and David, 1996) and aspects of the self (Thomas *et al*., 2015), other factors, for example, a drive to understand the voice, and the specific threat appraisals were novel.

Patients described that listening to DTV content led to them feeling depressed and anxious. In addition, all participants discussed self-harm or suicidal ideation despite not being asked directly about this. Clinical interventions that enable the patient to distance their attention from and challenge such detrimental voice content should be of benefit. However, to shift attention away from the content, our view is that clinicians will need to consider the sorts of reasons for listening to DTVs identified in this study. The range of reasons includes modifiable cognitions that can be addressed through CBT interventions. For example, the appraisal 'I listen to stop the voices harming other people' can readily be addressed via behavioural experiments which test the impact of listening versus distancing responses on the feared outcome. However, other themes (e.g. to understand the voice) may require alternative approaches or further treatment development work. Irrespective, the therapist sharing a list of reasons why these voices can be so believable and difficult to ignore can guide a therapist in working with the patient to build up a more thorough, detailed and efficient formulation of the problem of listening to and believing malevolent voices.

There are limitations to the current study. The most severe DTV presentations are not represented because several acutely unwell patients approached in this study said they were unable to talk about their experiences. In addition, people not in touch with clinical services and those experiencing DTVs in diagnoses other than non-affective psychoses may offer alternative perspectives.

The problem of being consumed by believable DTVs resonated with patients and reasons were readily identified in interviews. The study is a first step in developing a theory about reasons for listening to and believing DTVs. The clear next step is to develop assessment measures to assess key concepts in this approach. This will allow the emerging theory to be refined and tested using quantitative methods.

Supplementary material. To view supplementary material for this article, please visit https://doi.org/10.1017/S1352465820000429

Acknowledgements. We are enormously grateful to the participants who shared their stories as part of this research. We thank Rachel Temple and Tillie Cryer at the McPin Foundation for facilitating the lived experience consultation.

Ethical statement. All authors have abided by the ethical principles of psychologists and code of conduct set out by the APA.

Conflicts of interest. The authors report no conflicts of interest.

Financial support. B.S. is supported by an NIHR clinical doctoral fellowship (ICA-CDRF-2017-03-088), which funded the current study. L.I. is supported by an NIHR clinical doctoral fellowship (ICA-CDRF-2016-02-069). D.F. is supported by an NIHR Research Professorship (NIHR-RP-2014-05-003). The views expressed are those of the authors and not necessarily those of the NHS, the NIHR, or the Department of Health and Social Care. L.J. is employed by Oxford Health NHS Foundation Trust.

References

Birchwood, M., & Chadwick, P. (1997). The omnipotence of voices: testing the validity of a cognitive model. *Psychological Medicine*, *27*, 1345–1353. https://doi.org/10.1017/S0033291797005552

Birchwood, M., Dunn, G., Meaden, A., Tarrier, N., Lewis, S., Wykes, T., … & Peters, E. (2018). The COMMAND trial of cognitive therapy to prevent harmful compliance with command hallucinations: predictors of outcome and mediators of change. *Psychological Medicine*, *48*, 1966–1974. https://doi.org/10.1017/S0033291717003488

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*, 23–33. https://doi.org/10.1016/S2215-0366(14)70247-0

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

Chadwick, P., & Birchwood, M. (1995). The omnipotence of voices. II: The Beliefs About Voices Questionnaire (BAVQ). *British Journal of Psychiatry*, *166*, 773–776. https://doi.org/10.1192/bjp.166.6.773

Corbin, J., & Strauss, A. (2015). *Basics of Qualitative Research*. Los Angeles, CA, USA: Sage.

Glaser, B., & Strauss, A. (1967). *The Discovery of Grounded Theory*. Chicago, USA: Aldine.

McCarthy-Jones, S., Trauer, T., Mackinnon, A., Sims, E., Thomas, N., & Copolov, D. L. (2014). A New phenomenological survey of auditory hallucinations: evidence for subtypes and implications for theory and practice. *Schizophrenia Bulletin*, *40*, 225–235. https://doi.org/10.1093/schbul/sbs156

Moritz, S., & Larøi, F. (2008). Differences and similarities in the sensory and cognitive signatures of voice-hearing, intrusions and thoughts. *Schizophrenia Research*, *102*, 96–107. https://doi.org/10.1016/j.schres.2008.04.007

Nayani, T. H., & David, A. S. (1996). The auditory hallucination: a phenomenological survey. *Psychological Medicine*, *26*, 177–189. https://doi.org/10.1017/s003329170003381x

Peters, E. R., Williams, S. L., Cooke, M. A., & Kuipers, E. (2012). It's not what you hear, it's the way you think about it: appraisals as determinants of affect and behaviour in voice hearers. *Psychological Medicine*, *42*, 1507–1514. https://doi.org/10.1017/S0033291711002650

QSR International Pty Ltd (2018). NVivo. Retrieved from: https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

Thomas, N., Farhall, J., & Shawyer, F. (2015). Beliefs about voices and schemas about self and others in psychosis. *Behavioural and Cognitive Psychotherapy*, *43*, 209–223. https://doi.org/10.1017/S1352465813000817

Turner, D. T., Burger, S., Smit, F., Valmaggia, L. R., & van der Gaag, M. (2020). What constitutes sufficient evidence for case formulation-driven CBT for psychosis? Cumulative meta-analysis of the effect on hallucinations and delusions. *Schizophrenia Bulletin*. https://doi.org/10.1093/schbul/sbaa045

Varese, F., Morrison, A. P., Beck, R., Heffernan, S., Law, H., & Bentall, R. P. (2016). Experiential avoidance and appraisals of voices as predictors of voice-related distress. *British Journal of Clinical Psychology*, *55*, 320–331. https://doi.org/10.1111/bjc.12102

Cite this article: Sheaves B, Johns L, Griffith L, Isham L, The McPin Hearing Voices Lived Experience Advisory Panel, Kabir T, and Freeman D. Why do patients with psychosis listen to and believe derogatory and threatening voices? 21 reasons given by patients. *Behavioural and Cognitive Psychotherapy*. https://doi.org/10.1017/S1352465820000429

Schizophrenia Bulletin vol. 49 no. 1 pp. 151–160, 2023
https://doi.org/10.1093/schbul/sbac101
Advance Access publication August 10, 2022

Listening to and Believing Derogatory and Threatening Voices

Bryony Sheaves[1,2,*], Louise Johns[1,2], Bao S. Loe[3], Emily Bold[1,2], Emma Černis[1,2], The McPin Hearing Voices Lived Experience Advisory Panel[4,5], Andrew Molodynski[1,2], and Daniel Freeman[1,2]

[1]Department of Psychiatry, University of Oxford, Oxford, UK; [2]Oxford Health NHS Foundation Trust, Oxford, UK; [3]The Psychometrics Centre, University of Cambridge, Cambridge, UK; [4]The McPin Foundation, London, UK

[5]The group included P. Mirow and T. Oberai.

*To whom correspondence should be addressed; tel: 01865 618187, e-mail: bryony.sheaves@psych.ox.ac.uk

***Background and hypothesis*: A plausible cause of distress for voice hearers is listening to and believing the threats and criticisms heard. Qualitative research indicates that patients have understandable reasons to listen. This study aimed to develop the understanding of distress using this listening and believing framework. Measures were developed of listening and believing voices and the reasons, and associations with distress tested. *Study design*: A cross-sectional study of patients hearing derogatory and threatening voices ($N = 591$). Listening and Believing–Assessment and Listening and Believing–Reasons item pools were completed, and assessments of distress. Exploratory and confirmatory factor analyses and structural equation modeling (SEM) were conducted. *Study results*: 52% ($n = 307$) of participants believed their voices most or all the time. Listening and believing had 4 factors: active listening, passive listening, believing, and disregarding. Higher levels of believing, active listening, and particularly passive listening were associated with higher levels of anxiety, depression, and voice distress. Reasons for listening and believing formed 7 factors: to better understand the threat; being too worn down to resist; to learn something insightful; being alone with time to listen; voices trying to capture attention; voices sounding like real people; and voices sounding like known people. Each type of reason was associated with active listening, passive listening, and believing. SEM showed that feeling worn down in particular accounted for listening and believing. Test–retest reliability of measures was excellent. *Conclusions*: A framework of listening and believing negative voices has the potential to inform the understanding and treatment of voice distress.**

Key words: auditory hallucination/voices/cognitive models/distress/structural equation modelling/assessment measures

Introduction

The appraisal account of voice distress[1,2] has been important in understanding and treating the distress of people who hear voices. First highlighted over 25 years ago, meta-analysis indicates that appraisals concerning malevolence and omnipotence[1] have substantial associations with voice-related distress.[3] This understanding has largely formed the basis for cognitive behavioral techniques for helping patients hearing voices.[4,5] Cross-sectional data show that power and malevolence each explain approximately a fifth of the variance in distress in voice hearers.[2,3] Variance is therefore left unexplained. There are now endeavors to expand on this approach, for example by assessing perceived control in relation to voices.[6] We aimed to identify appraisals that explain distress for a subtype of voices: derogatory and threatening voices (DTVs). Our view is that if a person listens to and believes what DTVs say—and there are understandable reasons why an individual would do that—then that will increase distress.

Lived experience has been central to building our account. Patient interviews were used to generate a grounded theory to explain why DTVs are listened to and believed.[7] Twenty-one reasons for listening to and believing DTVs were identified, which were grouped into 6 higher order categories: to understand the voices; to be alert to the threat; a normal instinct to rely on sensory information; the voices can be of people known to the hearer; the DTVs use strategies to capture attention; and patients feel so worn down that it is hard to resist the voice experience.

This theoretical perspective requires quantitative testing. A first step is developing validated scales that assess key constructs outlined in this approach.[8]

© The Author(s) 2022. Published by Oxford University Press on behalf of the Maryland Psychiatric Research Center.
This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial License (https://creativecommons.org/licenses/by-nc/4.0/), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com

Downloaded from https://academic.oup.com/schizophreniabulletin/article/49/1/151/6659785 by University of Oxford user on 24 April 2023

Therefore we aimed to:

1. Develop an assessment scale for the degree of listening to and believing DTVs;
2. Develop an assessment scale for the reasons (appraisals) people listen to and believe DTVs;
3. Develop a full appraisal measure, a short-form version, and a very brief (5-item) version that can be used for different clinical and research purposes.
4. Test the hypothesis that listening to and believing DTVs predicts distress (anxiety, depression, and voice distress);
5. Test the hypothesis that the reasons for listening and believing are associated with the degree of listening to and believing DTVs; and
6. Identify the most important appraisals which predict listening to and believing DTVs.

Methods

Design

This cross-sectional observational study was conducted in 38 NHS mental health trusts between February 18, 2020 and December 3, 2021. NHS Trusts covered all the geographical regions of England. Two participant groups were recruited to conduct exploratory (part-A) and confirmatory (part-B) factor analyses. To assess test–retest reliability, a subgroup of part-B participants completed measures one week after their initial assessment. Informed consent was obtained from all participants. The study was approved by South Central Oxford-B NHS Research Ethics Committee (19/SC/0610).

Participants

Participants were identified and recruited by the National Institute of Health Research (NIHR) clinical research network. Participants were identified by clinicians who referred patients to the NIHR research teams, or via patients previously providing consent to be contacted for research. Participant inclusion criteria were:

1. Self-report endorsement of hearing voices at least once per week;
2. Endorsing derogatory and threatening voice content, defined as: (1) voices threatening to harm the participant; (2) threatening to harm people known by the participant; (3) voices telling the participant that they will be harmed by other people; (4) hearing voices which criticize them; or (5) tell them that other people are judging them negatively[7];
3. Being aged 16 or older;
4. An ability to understand English well enough to complete the questionnaires without the use of a translator; and
5. Being under the care of mental health services.

There were no exclusion criteria. 308 participants took part in part-A, 283 in part-B, and 41 completed the test–retest assessment. Participants completed informed consent and the assessment measures either on paper, via an online survey (JISC; https://www.onlinesurveys.ac.uk/) or by reading out answers over the phone to the researcher while viewing a paper copy of the questionnaires.

Assessment Measures

Experiences of Voice Hearing. Participants were asked their age at the onset of DTVs. Three questions from the PSYRATS auditory hallucinations scale[9] were delivered in self-report format and assessed voice frequency, duration, and degree of distress caused. Derogatory and threatening content was assessed via endorsement (yes/no) of the 5 definitions outlined in the inclusion criteria (see supplementary materials). The types of criticisms made by voices were assessed by adapting negative self-belief items in the Brief Core Schema scale[10] (e.g. "I am unloved" became "over the past week has the nasty voice told you that you are unloved?"). The 5-point response options were rephrased to: 0 = no, 1 = rarely, 2 = 1–2 days, 3 = several days, and 4 = at least once per day.

Listening and Believing Questionnaire–Assessment (LB-A). Individual items for this self-report questionnaire were generated from: (1) Qualitative interviews with people experiencing DTVs[7]; (2) The McPin Hearing Voices Lived Experience Advisory Panel (LEAP); and (3) Clinical psychologists with expertise in treating psychosis (B.S., E.Č., D.F., and L.J.)

Two theoretical factors informed the generation of items: (1) listening to DTVs and (2) believing DTVs. Reverse items were also included for both factors. Items for the listening factor covered both voluntary control (eg, *"I want to keep listening to what the nasty voices have to say")* and involuntary control of auditory attention (eg *There's nothing I can do but listen to what the nasty voices say"*). Items covered the period prior to voices starting (eg *"I listen out for the nasty voices"*), the point of onset of voices starting (eg *"When the nasty voices start it's almost impossible to ignore what they say*"), and during the voice hearing experience itself (eg "*It's difficult to focus on anything other than what the nasty voices say*"). The believing and disregarding subscales were generated to ensure that the amount of derogatory and threatening voice content a participant experiences does not affect the scoring, hence references to specific voice content were not included. Respondents were instructed to complete the questionnaire based on DTVs (termed "nasty voices") only, not positive or neutral voices.

Response options ranged from 0 (never) to 3 (all the time) and the past week was the time frame of reference. Part-A participants completed the full initial item pool of 46 questions. Part-A data were analyzed and

Downloaded from https://academic.oup.com/schizophreniabulletin/article/49/1/151/6659785 by University of Oxford user on 24 April 2023

subsequently part-B participants completed the shortened version (18-items).

Listening and Believing Questionnaire–Reasons (LB-R). Items for this self-report questionnaire were created from a qualitative study.[7] The scale covered the 6 themes identified in that study. Additional items were generated from the LEAP and psychosis specialist clinical psychologists (B.S., D.F., and L.J.)

Part-A participants completed the full initial item pool of 74 questions. Part-A data were analyzed and part-B participants subsequently completed a shortened version (41 items).

Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 is a self-administered 9-item questionnaire assessing depression. Response options range from not at all (0) to nearly every day (3). Higher scores indicate greater severity. Internal consistency is excellent (Cronbach's $\alpha = 0.89$).[11]

Generalized Anxiety Disorder Questionnaire-7 (GAD-7). The GAD-7 is a self-administered 7-item questionnaire assessing generalized anxiety disorder (GAD) symptoms. Response options range from not at all (0) to nearly every day (3). Higher scores indicate higher levels of anxiety. The internal consistency of the scale is excellent (Cronbach's $\alpha = 0.92$).[12]

Analysis

Analyses were conducted in R version-4.0.5[13] with packages lavaan,[14] psych,[15] lm.beta,[16] and regsem.[17] Factor analyses used oblimin rotation. Reduction of item pools was based on: factor loadings (<0.50 for assessment; <0.30 for reasons); cross-loading item (>0.30); item communality (<0.30); clarity of item phrasing; and creating theoretically coherent subscales. Model fit was assessed by: "reasonably good"=SRMR close to or below 0.08; RMSEA close to or below 0.06; CFI and TLI close to or greater than 0.95[18]; and "acceptable" = CFI and TLI 0.90–0.95[19]; and RMSEA < 0.08.[20]

To assess the factor structure of LB-A items, exploratory factor analysis (EFA) was conducted on part-A data using maximum likelihood estimation on the polychoric correlation matrix. Confirmatory factor analysis (CFA) was conducted on part-B data using diagonally weighted least square estimation owing to the ordinal data.[21] A bifactor model with a general factor was carried out to assess the appropriateness of calculating a total score. Test–retest reliability was assessed using the intraclass correlation coefficient (ICC). Simple regressions between the scale factors and distress variables were conducted using part-B data. The simple regressions with distress were additionally run whilst controlling for the 4 most prevalent diagnostic groups (schizophrenia, psychosis not otherwise specified, borderline personality disorder, and depressive episode/disorder).

The individual reasons for listening to and believing DTVs (LB-R items) are not of theoretical or clinical interest in and of themselves, only if they predict the degree of listening to and believing DTVs. Hence, the reasons item pool was initially reduced using regularized SEM (regSEM)[22] on part-A data to ensure each item predicted listening and/or believing. Active listening, passive listening, and believing nasty voices were regressed onto the 74-item pool and only items with a regression coefficient ≥ 0.01 across at least one of the dependent variables were retained. regSEM lasso is specifically designed to allow for the assessment of a complex model with a large number of parameters but with a limited number of observations.[22] A series of arbitrary penalty values are applied to regression paths to artificially drive the coefficient down towards zero. The purpose is to simplify the measurement model and only retain important predictors via an exploratory search. Significant items are assessed based on their non-zero coefficients. A range of penalty values was tested to determine the best fitting model by means of the Bayesian Information Criterion (BIC).[22] Retained items from the regSEM analysis were factor analyzed using minimum residual estimation on the polychoric correlation matrix, and the item pool was further reduced. A CFA model with a higher order factor (combining all latent variables) was carried out in order to assess the appropriateness of calculating a total score.

Sample B data were analyzed using CFA and robust maximum likelihood estimation (MLR) to create a full version of the scale. Further items were removed through CFA by assessing modification indices, factor loadings, and item content overlap. A shorter 16-item version of the reasons questionnaire was developed by regressing the higher order factor for the degree of listening to and believing nasty voices questionnaire onto the reasons item-pool using regSEM. This reduced the item pool, following which CFA was carried out using MLR. The internal consistency was tested using Cronbach's alpha (α) and the correlation with the full version of the scale assessed.

The same regSEM lasso method was used to create a 5-item version of the measure. The 5 items chosen had the highest coefficients across different latent variables. The internal consistency was tested (α) and the correlation with the full version of the scale assessed.

The LB-A factors were regressed individually onto each of the latent factors obtained from the reasons questionnaire. *P* values were corrected for multiple comparisons using the Holm method.[23]

In order to identify the most important reasons for listening to and believing nasty voices, accounting for shared variance, 2 SEMs were carried out using part-A and B datasets combined ($N = 576$). LB-A factors were together regressed onto the latent LB-R factors

Downloaded from https://academic.oup.com/schizophreniabulletin/article/49/1/151/6659785 by University of Oxford user on 24 April 2023

(Understand, Worn down, Learn, Attention, Real people, Alone, I know). Given that a high degree of shared variance was expected between disregarding DTVs and listening and believing, a separate model was run regressing disregarding DTVs onto the LB-R factors.

Results

Basic Characteristics

The ethnicity of the participant group was broadly representative of the population of England.[24] Most participants were single. Voice onset tended to be when participants were in their early 20s, and two-thirds of the participant group had a diagnosis of schizophrenia or psychosis not otherwise specified (table 1).

Each DTV content category (eg, voices making direct threats, saying that other people will harm them, direct criticisms etc.) was endorsed by at least 40% of participants. Voices criticized more often than spoke of threats. Passive listening was more common than believing and active listening. Half of participants endorsed believing DTVs most or all of the time and over half passively

Table 1. Socio-demographic and Clinical Characteristics

Variable		Part-A (N = 308)	Part-B (N = 283)
		Data are n (%) unless otherwise stated	
Age		M = 40.66 (SD = 13.11)	M = 40.95 (SD = 13.72)
Gender	Male	169 (55.23)	162 (57.24)
	Female	134 (43.79)	118 (41.70)
	Other	3 (0.98)	3 (1.06)
Ethnicity	Asian or Asian British	26 (8.64)	8 (2.88)
	Black, Black British, Caribbean, or African	24 (7.97)	16 (5.78)
	Mixed or multiple ethnic groups	14 (4.65)	4 (1.44)
	White	228 (75.75)	232 (83.76)
	Other ethnic group	9 (2.99)	17 (6.13)
Marital status	Single	217 (70.46)	205 (72.44)
	Married/ Civil partnership	38 (12.34)	32 (11.31)
	Cohabiting	24 (7.79)	18 (6.36)
	Divorced	22 (7.14)	25 (8.83)
	Widowed	7 (2.27)	3 (1.06)
Employment status	Unemployed	210 (68.18)	190 (67.38)
	Employed (part-time)	23 (7.47)	17 (6.03)
	Employed (full time)	21 (6.81)	20 (7.09)
	Voluntary work	17 (5.52)	13 (4.61)
	Retired	11 (3.57)	15 (5.32)
	Student	11 (3.57)	14 (4.96)
	Self-employed	9 (2.92)	7 (2.48)
	House wife/husband	6 (1.95)	6 (2.13)
Living arrangements	Live alone	134 (43.50)	116 (41.14)
	Live with parents	62 (20.13)	46 (16.31)
	Live with partner/spouse	54 (17.53)	44 (15.60)
	Supported accommodation	15 (4.87)	14 (4.97)
	Live with children	11 (3.57)	12 (4.26)
	Live with other family	8 (2.60)	6 (2.13)
	Live with friends	5 (1.62)	8 (2.84)
	Other	19 (6.17)	14 (4.97)
Age of onset of voices		M = 22.98 (SD = 11.83)	M = 25.23 (SD = 13.21)
Care team	Adult mental health team	201 (65.26)	174 (61.48)
	Early intervention for psychosis service	62 (20.13)	47 (16.61)
	Inpatient unit	41 (13.31)	60 (21.20)
	Other	4 (1.30)	2 (0.71)
Diagnosis[a]	Schizophrenia	132 (42.86)	120 (42.40)
	Psychosis not otherwise specified	71 (23.06)	69 (24.38)
	Depressive episode/disorder	48 (15.58)	46 (16.25)
	Borderline personality disorder	32 (10.39)	48 (16.96)
	Schizoaffective disorder	29 (9.42)	21 (7.45)
	PTSD/complex PTSD	22 (7.14)	14 (4.95)
	Other anxiety disorder	13 (4.22)	14 (4.95)
	Bipolar affective disorder	10 (3.25)	13 (4.59)
	Other	11 (3.57)	15 (5.65)

Note: M = mean, SD = standard deviation.
[a]Multiple diagnoses may have been endorsed, hence the percentage does not sum to 100.

Downloaded from https://academic.oup.com/schizophreniabulletin/article/49/1/151/6659785 by University of Oxford user on 24 April 2023

Table 2. Listening To and Believing DTVs: Descriptive Statistics

		Illustrative Example (N = 576)				
	Subscale Mean (SD) (N = 576)		Never n (%)	A Bit of the Time n (%)	Most of the Time n (%)	All the Time n (%)
Believing	5.35 (3.60)	"I believe what the nasty voices say"	94 (16)	186 (32)	173 (30)	123 (21)
Passive listening	7.24 (3.18)	"There's nothing I can do but listen to what the nasty voices say"	87 (15)	156 (27)	153 (27)	179 (31)
Active listening	4.04 (3.32)	"I listen out for the nasty voices"	231 (40)	161 (28)	106 (18)	78 (14)

listened to them most or all of the time. Actively listening was endorsed less (table 2). Of part-B participants, 221 (78.92%) screened positive for depression, and 189 (67.50%) for GAD.

LB-A

The polychoric correlation matrix was assessed for multicollinearity ($r \geq 0.90$). One item was subsequently removed. Bartlett's test for Sphericity confirmed that correlations between items were sufficiently large for EFA ($X^2 = 14092$, df = 990, $P < .001$). Sampling adequacy was "marvellous"[25] (overall KMO = 0.93, all items KMO > 0.77).

A 4-factor solution explained 59% of the cumulative variance (*active listening*, comprising items related to purposefully tuning into DTVs; *passive listening*, comprising items related to listening to DTVs, but without the intention of doing so; *believing* DTV content; and *disregarding* DTVs, which comprises items linked to both disregarding voice content and tuning out the voices). Factor loadings following item removal are presented in supplementary materials.

A 4-factor CFA model was subsequently carried out on part-B. Model fit was reasonably good based on the CFI, TLI, and SRMR and acceptable based on the RMSEA, however weighted least squares estimation is known to inflate the RMSEA[26] (robust $\chi^2 = 293.83$, df = 129, $P < .001$, CFI = 0.96, TLI = 0.95, RMSEA = 0.07, SRMR = 0.07). The internal consistencies of subscales were good ($\alpha = 0.79$–0.88). The factor loadings and correlations between factors are in supplementary tables.

A bifactor model with 3 factors and a general factor was carried out to assess the appropriateness of calculating a total score. Model fit was excellent (robust $\chi^2 = 57.68$, df = 42, $P = .05$, CFI = 1.00, TLI = 0.99, RMSEA = 0.04, SRMR = 0.04). Internal consistency of the total score was good ($\alpha = 0.87$).

Test–retest reliability over 1 week was excellent (ICC = 0.81, $n = 48$).[27] Active listening, passive listening, and believing each predicted anxiety, depression, and voice-related distress, confirming predictive validity (table 3). Each simple regression remained significant, with similar R^2 values whilst controlling for both voice frequency and diagnosis (supplementary materials).

Table 3. Simple Regressions between Listening To and Believing DTVs and Distress

	β	β[a]	R^2	F	P[b]
	Depression df = 1278				
Believing	0.88	0.44	0.19	65.08	**<.001**
Active listening	0.66	0.31	0.09	28.77	**<.001**
Passive listening	1.10	0.51	0.26	97.49	**<.001**
	Anxiety df = 1278				
Believing	0.80	0.47	0.22	77.02	**<.001**
Active listening	0.74	0.40	0.16	53.26	**<.001**
Passive listening	0.97	0.52	0.28	105.80	**<.001**
	Voice-related distress df = 1281				
Believing	0.06	0.21	0.04	12.83	**<.001**
Active listening	0.05	0.14	0.02	5.42	**<.05**
Passive listening	0.11	0.34	0.12	36.83	**<.001**

[a]Standardized beta coefficient.
[b]Corrected for multiple comparisons using the Holm method.
Bold values indicate statistical significance.

LB-R

The polychoric correlation matrix for all the reasoning items was assessed for multicollinearity. No items met criteria ($r \geq 0.90$). In order to reduce the item pool, active listening, passive listening, and believing were each regressed onto the 74 items from the reasons questionnaire using the regSEM lasso with lambda (λ)=5 and an iteration step of 0.03. The optimal BIC solution was observed with $\lambda = 0.12$. Twenty-one parameters had their paths regularized to <0.01 across all 3 dependent variables and were omitted from further analysis (supplementary materials).

Fifty-three items were taken forward to the EFA. Bartlett's test for sphericity confirmed that correlations between items were sufficiently large for EFA ($X^2 = 8611.23$, df = 1378, $P < .001$). The Kaiser–Meyer–Olkin test indicated that overall sampling adequacy was "marvellous"[25] (overall KMO = 0.91, all items KMO > 0.69). A 7-factor solution explained 49% of the cumulative variance. The 7

Downloaded from https://academic.oup.com/schizophreniabulletin/article/49/1/151/6659785 by University of Oxford user on 24 April 2023

factors were: to better understand the voices to deal with the threat (understand); being so worn down it is difficult to resist the voice experience (worn down); I'll learn something insightful (learn); voices use strategies that capture attention (attention); the voices are just like real people (real people); I'm alone so have time and space to listen (alone); the voices are of people I know (I know). Factor loadings and correlations between factors are in supplementary materials.

A correlated 7-factor CFA model was performed on part-B, including adjustments (3 sets of correlated items) based on the modification indices. Fit indices were adequate on all indices (robust $\chi^2 = 446.89$, df = 326, $P < .001$, CFI = 0.96, TLI = 0.95, RMSEA = 0.04, SRMR = 0.05). Internal consistencies of the subscales were good to excellent ($\alpha = 0.71$–0.88).

A 7-factor CFA model with a higher order factor was carried out in order to assess the appropriateness of calculating a total "reasons for listening to and believing" score. Model fit was adequate (robust $\chi^2 = 500.84$, df = 340, $P < .001$, CFI = 0.94, TLI = 0.93, RMSEA = 0.04, SRMR = 0.07). Internal consistency was excellent ($\alpha = 0.91$). One-week test–retest reliability for the total score was excellent (ICC = 0.90, $n = 48$). Each of the 7 factors predicted the degree of active listening, passive listening, or believing nasty voices (table 4); worn down, alone, and real people significantly predicted disregarding (supplementary materials).

Regressing active listening, passive listening, and believing onto the 7 latent variables for the reasons questionnaire resulted in 8 negative coefficients which were previously positive in simple regressions. These were likely to be suppressor effects caused by shared variance with other predictors[28] and hence were removed before using a backwards elimination approach to identify the remaining significant predictors of listening to and believing nasty voices.

The final 3-factor SEM regressing active listening, passive listening, and believing onto the remaining latent variables for the reasons questionnaire showed reasonably good fit indices (figure 1), (robust $\chi^2 = 1152.73$, df = 700, $P < .001$, CFI = 0.95, TLI = 0.95, RMSEA = 0.03, SRMR = 0.05). The model explained 70% of the variance in passive listening, 52% in believing, and 46% in active listening. The factor labeled "worn down", which primarily comprises low self-confidence and mental defeat, was a particularly strong predictor of both passive listening to and believing DTVs. A separate SEM with disregarding as the dependent variable showed worn down to be the only significant predictor (supplementary materials).

LB-R: 16-Item Short-Form Version

A regSEM lasso was estimated with $\lambda = 2$ and an iteration step of 0.03. The BIC was lowest with a $\lambda = 0.03$. Sixteen parameters had non-zero coefficients and were entered into CFA. The 16 parameters included 6 of 7 of the latent variables ("*I hear the voice of someone I know*" was excluded). Model fit was adequate (robust $\chi^2 = 164.22$, df = 98, $P < .001$, CFI = 0.95, TLI = 0.94, RMSEA = 0.05, SRMR = 0.05). The higher order factor for the 16-item version significantly predicted the higher order factor for the degree of listening to and believing nasty voices (unstandardized $\beta = 0.89$, standard error = 0.13, $P < .001$), was strongly associated with the full 28-item version ($r(274) = 0.96$, $P < .001$) explaining 93% of the variance. Internal consistency was excellent ($\alpha = 0.88$).

LB-R: 5-Item Brief Measure

The highest beta coefficients across different factors from the regSEM in Section 3.4 (worn down, real people,

Table 4. Simple Regressions Between 7 Factors for the LB-R and 3 Factors for the LB-A

	Believing				Active Listening				Passive Listening			
	β	R^2	F^a	P^b	β	R^2	F^a	P^b	β	R^2	F^a	P^b
Understand	0.33	0.20	69.17	**<.001**	0.35	0.50	270.40	**<.001**	0.49	0.41	192.40	**<.001**
Worn down	0.56	0.64	482.70	**<.001**	0.24	0.26	97.04	**<.001**	0.68	0.84	1385.00	**<.001**
Learn	0.25	0.12	37.04	**<.001**	0.31	0.39	173.10	**<.001**	0.23	0.09	25.85	**<.001**
Attention	0.46	0.22	78.54	**<.001**	0.47	0.51	285.30	**<.001**	0.59	0.33	132.70	**<.001**
Real people	0.47	0.37	157.80	**<.001**	0.22	0.18	58.14	**<.001**	0.60	0.52	294.30	**<.001**
Alone	0.31	0.23	79.55	**<.001**	0.20	0.20	68.95	**<.001**	0.45	0.42	195.30	**<.001**
I know	0.07	0.01	3.73	.11	0.14	0.11	35.17	**<.001**	0.06	0.01	2.12	.15

[a]Degrees of freedom for all *F* statistics = 1274.
[b]*P* values adjusted using the Holm method.
Factor scores were used for all regressions, hence β values can be compared across regressions.
Understand = to better understand the voices to deal with the threat, worn down = being so worn down it is difficult to resist the voice experience, Learn = I'll learn something insightful, Attention = voices use strategies that capture attention, Real people = the voices are just like real people, Alone = I'm alone so have time and space to listen, I know = the voices are of people I know.
Bold values indicate statistical significance.

Downloaded from https://academic.oup.com/schizophreniabulletin/article/49/1/151/6659785 by University of Oxford user on 24 April 2023

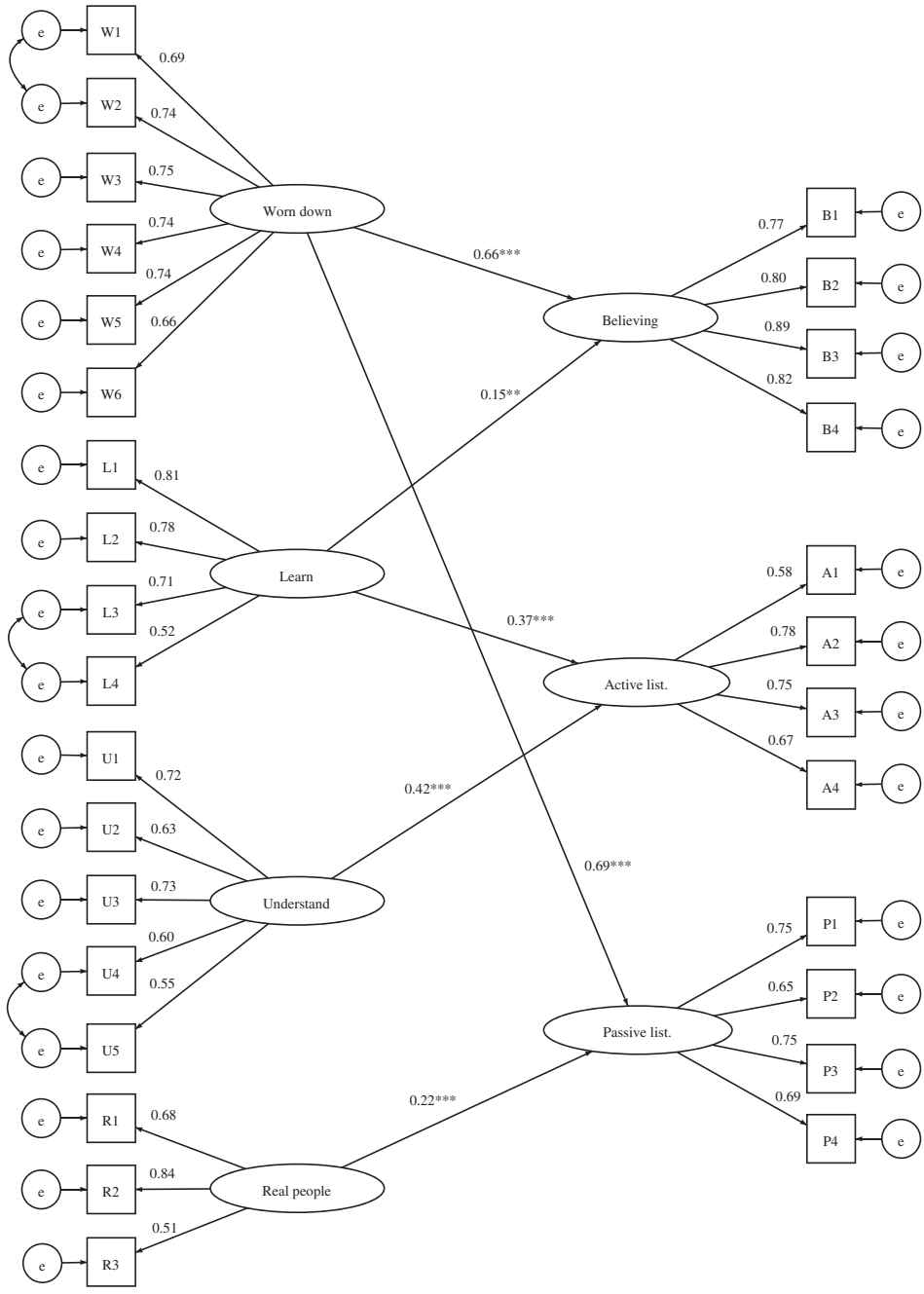


Fig. 1. Final 3-factor SEM of the relationship, after backwards elimination, between listening to and believing nasty voices and the reasons. Standardized beta coefficients are reported alongside the following *P* value cut offs: $P < .01$**, $P < .001$***. The first item for each factor was fixed to 1. All factor loadings were significant at $P < .001$. Understand = to better understand the voices to deal with the threat, worn down = being so worn down it is difficult to resist the voice experience, Learn = I'll learn something insightful, Real people = the voices are just like real people.

attention, understand, and learn) formed a 5-item scale with $\alpha = 0.71$, and a correlation of .90 with the total score from the full 28-item version (explaining 81% of the variance in the full version).

Discussion

We set out to broaden the understanding of the potential causes of distress in voice hearers. The focus was on one type of voice experience: hearing derogatory or threatening voices. It was hypothesized that listening to the negative content and believing it to be true would heighten emotional distress. It was also hypothesized that patients would have multiple motivations to listen to and believe the voices. It was found that listening to and believing DTVs is common: half of the participants endorsed a high degree of believing the threats and criticisms. Passive listening to voices (ie, without any sense of intent) most

Downloaded from https://academic.oup.com/schizophreniabulletin/article/49/1/151/6659785 by University of Oxford user on 24 April 2023

or all of the time was endorsed by 58% of participants, and was an even more common occurrence than active listening. Given that participants endorsed hearing a range of threats and criticisms from voices, it is consistent with our perspective that overall levels of depression and anxiety in the participant group were high. Within the group, higher levels of active listening, passive listening, and believing nasty voices were each significantly associated with higher levels of anxiety, depression, and voice-related distress, even when controlling for voice frequency. Passive listening explained approximately one quarter of the variance in depression and anxiety, and believing DTVs explained approximately a fifth of the variance. Psychological strategies which enable voice hearers to disengage from listening to and believing derogatory and threatening content could have the potential to provide an innovative route to reduce distress. This requires explicit testing.

Analysis of the data indicated that there were 7 different types of reasons for listening to and believing DTVs. These are now measurable via a 28-item assessment scale and shortened versions which correlate very highly with the longer version. The reasons (eg to better understand the voices to deal with the threat), are logical and reasonable responses to the very real experience of hearing a voice. The final SEM model indicated that the reasons accounted for the majority of variance in passive listening, and half of the variance in believing and active listening. Believing DTVs was strongly predicted by being worn down (comprising low self-confidence and mental defeat), and to a lesser extent the view that voices are a valuable source of information ("I might learn something insightful"). Passive listening was also strongly predicted by being worn down, and to a lesser degree by how real the voices sounded. The potential importance of feeling worn down builds on previous findings that low self-confidence is common for voice hearers,[29] and that both low self-worth in comparison to voices[30] (social rank) and feelings of entrapment[31] (a construct closely related to mental defeat) are associated with depression in voice hearers. Cross-sectional data requires very cautious interpretation, but it is plausible that building self-confidence and overcoming mental defeat could be particularly helpful for voice hearers to begin to question the veracity of DTV content and to foster greater control over whether they choose to listen.

Believing and passive listening, but not active listening, were associated with feeling worn down. Active listening was associated with reasons relating to the positive consequences of engagement, which fell into 2 categories: an opportunity to better understand the voices in order to deal with the threat (eg "*It might help me work out what they could do to me"*), and an opportunity to learn something insightful (eg "*Listening to the voice will help me to learn about myself"*). Helping people alter the view that voices are a trustworthy source of information could help enable patients who hear DTVs to choose to direct their attention away from voices and towards meaningful activities and interests that can help improve mood.

The key limitation of the study is the cross-sectional design. The direction of the association between listening to and believing DTVs and negative affect cannot be determined. Given that defeat and low self-confidence are psychological experiences closely linked to the experience of low mood, it is probable that depression also leads to passive listening. A bidirectional relationship is most plausible. Causal interventionist tests are required to assess both directional pathways. It is notable that listening to and believing DTVs was more closely associated with the more distal measures of anxiety and depression than voice-related distress. However the relationship is likely affected by the use of a single-item question from the PSYRATS to assess voice-related distress. The size of association should therefore be interpreted cautiously. Lastly, the assessment of predictive validity was limited to negative affect. It is plausible that listening to DTVs can also lead to other negative reactions such as confusion, and greater conviction in delusional beliefs. These relationships remain to be assessed.

It is also notable that the majority of variance in distress remains unexplained. There are likely other contributors to the occurrence of negative affect in this group, including perceptions of the controllability over illness,[32] loss of social roles such as employment, experiences of stigma[33] and social isolation,[34] elevated worry,[29] and the impact of other psychotic experiences. Depression and anxiety disorders, which are known to be elevated in people with psychosis,[32] may also be separate cooccurring clinical disorders. There is also room for improvement in explaining the reasons why patients believe and actively listen to DTVs. Around half of the variance in believing and active listening was unaccounted for by the reasons scale. When asked about unmeasured factors that could affect believing and active listening the LEAP proposed that believability could be influenced by the quality of evidence that voices use to back up their criticisms and threats. And that one might be more inclined to actively listen out for the voice's perspective in a new environment, when the perceptual system is generally more alert to threat. These could be assessed in future research and integrated into the current theory. There could also be future research to examine potential contributors to the appraisals identified in this study. Traumatic experiences,[35] sleep disruption,[36,37] and low self-confidence[7] would be potential contributors that are worthy of investigation. Cognitive functioning (eg verbal distractibility and inhibitory control) may also be important in determining

Downloaded from https://academic.oup.com/schizophreniabulletin/article/49/1/151/6659785 by University of Oxford user on 24 April 2023

whether or not voices are listened to.[38] Notwithstanding the limitations of the current study, the framework of active listening, passive listening and believing DTVs is complementary to existing appraisal frameworks, and provides a new perspective on voice distress that will be possible to translate into psychological intervention.

Supplementary Material

Supplementary material is available at *Schizophrenia Bulletin* online.

Acknowledgments

We are grateful to all the participants who took part in this research, to the NIHR Clinical Research Network delivery teams, the local principal investigators across the NHS Trusts for facilitating recruitment, and the clinical teams who referred patients to the research. We thank Imogen Kilcoyne and Sapphira McBride for help with data entry and Rachel Batchelor for help setting up the online surveys. Lastly we thank Thomas Kabir, Rachel Temple and Anja Hollowell from the McPin Foundation for their facilitation of lived experience involvement. The authors have declared that there are no conflicts of interest in relation to the subject of this study.

Funding

B.S. is supported by an Higher Education England/National Institute for Health and Care Research clinical doctoral research fellowship (ICA-CDRF-2017-03-088), which funded the current study. DF is an NIHR Senior Investigator. L.J. is employed by Oxford Health NHS Foundation Trust. This publication presents independent research funded by Health Education England. The views expressed are those of the authors and not necessarily those of the NHS, HEE, the NIHR, or the Department of Health and Social Care. The funding sources had no role in the study design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication.

References

1. Chadwick P, Birchwood M. The omnipotence of voices: a cognitive approach to auditory hallucinations. *Br J Psychiatry.* 1994;164:190–201.
2. Chadwick P, Lees S, Birchwood M. The revised beliefs about voices questionnaire (BAVQ-R). *Br J Psychiatry.* 2000;177:229–232.
3. Tsang A, Bucci S, Branitsky A, *et al*. The relationship between appraisals of voices (auditory verbal hallucinations) and distress in voice-hearers with schizophrenia-spectrum diagnoses: a meta-analytic review. *Schizophr Res.* 2021;230:38–47.
4. Birchwood M, Michail M, Meaden A, *et al*. Cognitive behaviour therapy to prevent harmful compliance with command hallucinations (COMMAND): a randomised controlled trial. *Lancet Psychiatry.* 2014;1:23–33.
5. Craig TK, Rus-Calafell M, Ward T, *et al*. AVATAR therapy for auditory verbal hallucinations in people with psychosis: a single-blind, randomised controlled trial. *Lancet Psychiatry.* 2018;5:31–40.
6. Mourgues C, Hammer A, Fisher V, *et al.* Measuring voluntary control over hallucinations: the Yale Control Over Perceptual Experiences (COPE) Scales. *Schizophr Bull.* 2022;48:383–673.
7. Sheaves B, Johns L, Griffith L, Isham L, Kabir T, Freeman D. Why do patients with psychosis listen to and believe derogatory and threatening voices? 21 reasons given by patients. *Behav Cogn Psychother.* 2020;1–15. epub ahead of print.
8. Thomas N, Hayward M, Peters E, Gaag M Van Der, Bentall RP, Jenner J. Psychological therapies for auditory hallucinations (voices): current status and key directions for future research. *Schizophr Bull.* 2014;40:S202–12.
9. Haddock G, McCarron J, Tarrier N, Faragher EB. Scales to measure dimensions of hallucinations and delusions: the psychotic symptom rating scales (PSYRATS). *Psychol Med.* 1999;29:879–889.
10. Fowler D, Freeman D, Smith B, *et al*. The Brief Core Schema Scales (BCSS): psychometric properties and associations with paranoia and grandiosity in non-clinical and psychosis samples. *Psychol Med.* 2006;36:749–759.
11. Kroenke K, Spitzer RL, Williams JBW. The PHQ-9. Validity of a brief depression severity measure. *J Gen Intern Med.* 2001;16:606–613.
12. Spitzer RL, Kroenke K, Williams JBW, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med.* 2006;166:1092–1097.
13. R Core Team. *R: A Language and Environment for Statistical Computing*. 2021. https://www.r-project.org/.
14. Rosseel Y. lavaan: An R package for structural equation modeling. *J Statistical Software.* 2012;48(2):1–36. https://doi.org/10.18637/jss.v048.i02
15. Revelle W. psych: Procedures for Personality and Psychological Research. 2020. https://cran.r-project.org/package=psych.
16. Behrendt S. lm.beta: Add Standardized Regression Coefficients to lm-Objects. 2014. https://cran.r-project.org/package=lm.beta.
17. Jacobucci R, Grimm KJ, Brandmaier AM, *et al.* regsem: Regularized Structural Equation Modeling. 2021. https://cran.r-project.org/package=regsem.
18. Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct Equ Model*. 1999;6:1–55.
19. Bentler PM. Comparative fit indexes in structural models. *Psychol Bull.* 1990;107:238–246.
20. Brown MW, Cudeck R. Alternative ways of assessing model fit. In: Bollen KA, Long JS, eds. *Testing Structural Equation Models*. Newbury Park, CA: Sage; 1993:136–162.
21. Li C-H. Confirmatory factor analysis with ordinal data: comparing robust maximum likelihood and diagonally weighted least squares. *Behav Res Methods.* 2016;48:936–949.
22. Jacobucci R, Brandmaier AM, Kievit RA. A practical guide to variable selection in structural equation modeling by using

Downloaded from https://academic.oup.com/schizophreniabulletin/article/49/1/151/6659785 by University of Oxford user on 24 April 2023

regularized multiple-indicators, multiple-causes models. *Adv Methods Pract Psychol Sci.* 2019;2:55–76.
23. Holm SA. Simple sequentially rejective multiple test procedure. *Scand J Stat.* 1979;6:65–70.
24. Office for National Statistics. Population of England and Wales: by ethnicity. Gov.uk. 2018. https://www.ethnicity-facts-figures.service.gov.uk/uk-population-by-ethnicity/national-and-regional-populations/population-of-england-and-wales/latest. Accessed February 21, 2022.
25. Kaiser HF. An index of factorial simplicity. *Psychometrika.* 1974;39:31–36.
26. Xia Y, Yang Y. RMSEA, CFI, and TLI in structural equation modeling with ordered categorical data: the story they tell depends on the estimation methods. *Behav Res Methods.* 2019;51:409–428.
27. Cicchetti DV. Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychol Assess.* 1994;6:284–290.
28. Maassen GH, Bakker AB. Suppressor variables in path analysis: definitions and interpretations. *Sociol Methods Res.* 2001;30:241–270.
29. Freeman D, Taylor KM, Molodynski A, Waite F. Treatable clinical intervention targets for patients with schizophrenia. *Schizophr Res.* 2019;211:44–50.
30. Birchwood M, Gilbert P, Gilbert J, *et al*. Interpersonal and role-related schema influence the relationship with the dominant "voice" in schizophrenia: a comparison of three models. *Psychol Med.* 2004;34:1571–1580.
31. Rooke O, Birchwood M. Loss, humiliation and entrapment as appraisals of schizophrenic illness: a prospective study of depressed and non-depressed patients. *Br J Clin Psychol.* 1998;37:259–268.
32. Birchwood M, Mason R, Macmillan F, Healy J. Depression, demoralization and control over psychotic illness a comparison of depressed and non-depressed patients with a chronic psychosis. *Psychol Med.* 1993;23:387–395.
33. Xu Z, Müller M, Heekeren K, *et al*. Pathways between stigma and suicidal ideation among people at risk of psychosis. *Schizophr Res.* 2016;172:184–188.
34. Sheaves B, Johns L, Černis E, Griffith L, Freeman D. The challenges and opportunities of social connection when hearing derogatory and threatening voices: a thematic analysis with patients experiencing psychosis. *Psychol Psychother Theory Res Pract*. 2021;94:341–356.
35. Andrew EM, Gray NS, Snowden RJ. The relationship between trauma and beliefs about hearing voices: a study of psychiatric and non-psychiatric voice hearers. *Psychol Med.* 2008;38:1409–1417.
36. Sheaves B, Bebbington PE, Goodwin GM, *et al*. Insomnia and hallucinations in the general population: findings from the 2000 and 2007 British Psychiatric Morbidity Surveys. *Psychiatry Res.* 2016;241:141–146.
37. Reeve S, Nickless A, Sheaves B, Freeman D. Insomnia, negative affect, and psychotic experiences: modelling pathways over time in a clinical observational study. *Psychiatry Res.* 2018;269:673–680.
38. Daalman K, van Zandvoort M, Bootsman F, Boks M, Kahn R, Sommer I. Auditory verbal hallucinations and cognitive functioning in healthy individuals. *Schizophr Res.* 2011;132:203–207.

Downloaded from https://academic.oup.com/schizophreniabulletin/article/49/1/151/6659785 by University of Oxford user on 24 April 2023

the british psychological society
promoting excellence in psychology

Psychology and Psychotherapy: Theory, Research and Practice (2020)
© 2020 The Authors. Psychology and Psychotherapy: Theory, Research and Practice published by John Wiley & Sons Ltd on behalf of British Psychological Society
www.wileyonlinelibrary.com

Qualitative paper

The challenges and opportunities of social connection when hearing derogatory and threatening voices: A thematic analysis with patients experiencing psychosis

Bryony Sheaves[1,2]*, Louise Johns[1,2], Emma Černis[1,2], Laura Griffith[3], The McPin Hearing Voices Lived Experience Advisory Panel[4,†], Daniel Freeman[1,2],

[1]Department of Psychiatry, University of Oxford, UK
[2]Oxford Health NHS Foundation Trust, UK
[3]Public Health England, London, UK
[4]The McPin Foundation, London, UK

Objectives. Relationships with other people are important determinants of the course of psychosis, yet social isolation is common. This study sought to learn about the patient experience of being around other people when hearing derogatory and threatening voices (DTVs).

Design. A qualitative interview study.

Methods. Fifteen participants with experience of hearing DTVs in the context of non-affective psychosis were recruited from NHS services. Data were obtained by semi-structured interviews and analysed using thematic analysis.

Results. Three themes were identified: (1) reasons why interacting with people is difficult when hearing DTVs; (2) the relationship between social connection and DTVs; and (3) factors which enable voice hearers to connect with others. A further ten sub-themes are outlined as reasons why hearing DTVs led to lower social connection, including difficulties during conversations (e.g., *the concentration required is hard*), negative expectations of interactions (e.g., *fearing negative judgement from others*), and difficulties sharing experiences of voices (e.g., *people will be hurt or upset if I tell them about the voices*). Isolation was a common response to hearing DTVs but also a time of vulnerability for hearing voices. Managing the challenges of interacting with people led to some improvements in DTVs.

Conclusions. There are understandable reasons why hearing DTVs leads to lower social connection. Yet isolating oneself can also be a time of vulnerability for DTVs. Social

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

**Correspondence should be addressed to Bryony Sheaves, Department of Psychiatry, University of Oxford, Warneford Hospital, Oxford, UK (email: bryony.sheaves@psych.ox.ac.uk).*
The group were: †T. Oberai, P. Green, P. Mirrow.

DOI:10.1111/papt.12303

connection might be one vehicle for disengaging from and disputing derogatory and threatening voice content. The effect on voice hearing of social recovery interventions warrants further investigation.

Practitioner points

- Participants shared 10 reasons why being around people is challenging when hearing derogatory and threatening voices. These typically affected both daily social experiences and contact with clinicians.
- Common initial responses to hearing DTVs were to reduce contact with people, experience difficulties connecting during conversations and to avoid sharing the experience of voice hearing.
- However, social isolation was a time of vulnerability to DTVs, and hence, increasing social connection might be a target for interventions.
- A range of factors enabled voice hearers to manage social situations, for example: the fostering of trust, self-acceptance, learning when it is better to stay at home, and developing a narrative to explain voice hearing to others.
- Addressing the barriers to connecting with others might have an important role in personal recovery from voice hearing.

> *"the worst thing I did was when I was 16 I didn't tell anyone. And then I ended up like having a complete breakdown when I was 18 and I think that could have been averted if I had actually reached out to someone"*. (V7)

Feelings of loneliness and social isolation are common in psychosis (Meltzer *et al.*, 2013; Michalska Da Rocha, Rhodes, Vasilopoulou, & Hutton, 2018) and evident even from a first episode (Sündermann, Onwumere, Kane, Morgan, & Kuipers, 2014). Social isolation is an important issue in itself and also predicts later severity of symptoms (Norman *et al.*, 2005; Salokangas, 1997) and the likelihood of a later inpatient admission (Norman *et al.*, 2005). The odds of psychotic experiences persisting in the general population is halved for those who are married, compared with single people (DeVylder, Lehmann, & Chen, 2015), and being single whilst living in a neighbourhood with fewer single people increases the incidence of schizophrenia, likely due to increased isolation (Van Os, Driessen, Gunther, & Delespaul, 2000). Relationships with other people are clearly important determinants of the course of psychosis, yet understanding the reasons why patients become isolated and ways in which they might overcome isolation has received surprisingly little academic focus.

Reasons why hearing derogatory and threatening voices might lead to lower social connection

The challenges that social interactions bring to people who hear distressing voices are likely to be different to those of other experientially distinct psychotic experiences (e.g., grandiose delusions). They may also differ according to voice presentation (companionate or commanding vs. threatening voices). This paper therefore focuses on the experience of being around other people in the context of one specific presentation: derogatory and threatening voices (DTVs).

There are several candidate reasons why DTVs might reduce the quality and availability of relationships. The stress of stigma (Xu *et al.*, 2016) and what voices actually say (e.g., that the patient is in danger) can lead voice hearers to isolate themselves. Being distracted

by voices can decrease the quality of interactions, and patient aggression towards others can result in physical distancing in order to maintain safety (Onwumere, Parkyn, Learmonth, & Kuipers, 2019). Conversation topics may also be important. Hearing DTVs may be the most salient topic of conversation for a voice hearer. However, there are several barriers to disclosing the experience of voice hearing including concerns about upsetting others and fear of stigma and resultant shame (Bogen-Johnston, de Visser, Strauss, Berry, & Hayward, 2017; Mawson, Berry, Murray, & Hayward, 2011; Watkins, Gupta, & Sanderson, 2019). This reduces the common ground for conversation topics.

Aim

The current study sought to build on this literature by learning from patients' experiences of being around people whilst hearing DTVs.

Method

Participants

The qualitative interview data were obtained within a study (published separately) which had a primary question: 'why do people listen to and believe DTVs?' (Sheaves *et al*., 2020). Theoretical sampling was used to recruit participants for the purpose of grounded theory analysis linked to that primary (but separate) research question. A pilot stage, early in sampling, ensured a diversity of: age, duration of hearing voices, and employment status. Subsequently, theoretical sampling and eventual theoretical saturation (Corbin & Strauss, 2015) guided recruitment for the purpose of generating the theory reported in Sheaves *et al*. (2020). Hence, recruitment was not guided by the aim of the current study.

Fifteen participants were sought from clinical teams within Oxford Health NHS Foundation Trust. BS completed a telephone screen with the referrer and participant. Inclusion criteria were as follows: daily experience (current or past) of DTVs; experience of DTVs for at least three months; and willing and able to recall and discuss their experience in detail; fluent in English; age 18-65; willing and able to provide informed consent. Exclusion criteria were as follows: moderate-to-severe learning disability; voices caused by an organic syndrome (e.g., dementia, head injury); and voices occurring solely within the context of substance misuse, personality disorder, or a mood episode (depression or mania). Two participants had previously met the interviewer through participation in research trials. The remaining participants were unknown to the researcher.

The sample was predominantly single, White British, unemployed, and lived either alone or with parents (Table 1). All but one participant currently heard DTVs. The majority reported hearing voices whilst talking to other people, but found them either less frequent or more in the background of attention when compared to hearing voices when they were alone.

Procedure

The study received NHS ethical approval (ref: 18/SC/0443). LG (a qualitative methodologist), BS, DF, and LJ (clinical psychologists and academics specializing in psychosis research) and a lived experience advisory panel (LEAP) consulted on the protocol, topic guide, interview process, and emerging themes. An audio-recorded semi-structured

Table 1. Demographics and clinical characteristics ($N = 15$)

Demographic or clinical characteristics	Frequency
Age	
≤20	1
21–30	3
31–40	5
41–50	5
51–60	1
Ethnicity	
White British	13
Chinese	1
Black British	1
Marital status	
Single	11
Married/civil partnership	3
Divorced	1
Employment status	
Unemployed	10
Employed (part time)	2
Self-employed	1
Student	1
Voluntary work	1
Accommodation status	
Lives alone	6
Lives with parents	6
Lives with partner/spouse	2
Supported accommodation	1
Diagnosis	
Schizophrenia	10
Schizoaffective disorder	1
Psychosis NOS	4
'Do/did you hear voices when talking to other people? What is/was that like?'	
Yes	4
Yes, but less often than alone	3
Yes, but more in the background	3
No	3
N/A	2
Reported testing voice content by discussing with other people[a]	
Yes, successful test	4
Yes, unsuccessful test	2
No	8
N/A	1
Age of onset of voice hearing	
≤15	4
16–25	7
26–35	2
36–45	1
46–55	1

Continued

Table 1. (*Continued*)

Demographic or clinical characteristics	Frequency
Duration of voice hearing (years)	
1–5 years	5
6–10 years	0
11–15 years	3
16–20 years	4
21–25 years	2
26–30 years	1

Note. [a]For example, asking if other people also heard the voice or sharing voice content for the purpose of testing it.

interview was conducted with BS and transcribed verbatim. Interviews were one to one, lasted around 90 min, and took place at the participant's home or NHS clinic. The researcher's background and motivation for conducting the research was shared, and the participants' expertise through their experience emphasized to minimize any potential power imbalance. The interview intended to generate the participants' own detailed description of their experience rather than merely responding to closed questions. One question probed social interactions whilst hearing voices (*'Do/did you hear voices when talking to other people? What is/was that like?'*) which was asked to all participants. Relationships with others were also raised by participants, unprompted, throughout the interview (e.g., when sharing times that voices were better or worse, or advice for other voice hearers). Further details on the interview process are in Supporting Information.

Analysis

Thematic analysis was used to identify substantive themes across the data set. Data familiarization involved listening to the audio tape whilst reading the transcript. A broad code of 'voices and social interactions' was generated to capture any data related to the research question alongside codes for other interpersonal concepts derived from the data (e.g., 'trust' and 'social isolation'). This initial coding took place in parallel to coding for Sheaves *et al*. (2020). BS (who also conducted the interviews) conducted all analysis, and EČ assessed the appropriateness of each code from those provided by BS. Both are clinical psychologists with experience of psychosis research. Discrepancies were discussed and a consensus agreed. NVivo 12 (QSR International Pty Ltd, 2018) supported the data coding, organization, and analysis. Initial analysis revealed reasons why hearing DTVs led to isolation and reasons why social interactions can alleviate DTVs. Preliminary analysis was discussed with the LEAP and two clinical psychologists (DF and LJ), and additional codes were added as follows: 1) Why long-term isolation is not the best solution for voice hearing and 2) ways of managing interactions. All transcripts were subsequently recoded using this refined framework. A research diary was kept throughout the interviewing and analysis process.

Results

Three themes were identified as being important to the experience of being around people when hearing DTVs: (1) reasons why interacting with people is difficult when

hearing DTVs; (2) the relationship between social connection and DTVs; and (3) factors which enabled voice hearers to connect with others. Each theme, their corresponding sub-themes, and supporting quotes are outlined below.

Reasons why interacting with people is difficult whilst hearing DTVs

The comments of the voices reduce my trust in others

Voices reduced trust in others by making direct comments *'the voices are telling me people are going to hurt me [..] I can't really walk past people'* (V10). This included comments about a therapist *'just because you have had like one meeting [..]they would be like don't think [..] they are not going to do anything'*. (V10). Mistrust towards the voices also became generalized to everyone *'you can't trust people [..] it sort of reflects into my social life because I find it difficult to trust people'* (V13). A participant who heard the voice of a family friend described the impact on trusting her mum: *'I thought that was her helping [the voice], so that changed my view on her for a while'* (V8).

If I talk to people about the voices, it will hurt or upset them

Many participants felt unable to discuss the derogatory and threatening voice content out of selfless concern for their loved ones: *'I would rather it just scared me than scared anybody else'* (V5). V2 heard the voice of his parents-in-law, but felt there were no benefits to sharing this with his wife: *'I don't mean to keep secrets, it's not secrets it's just I don't want her to get hurt by it. [..] there's no good can come from it by telling her.'*. He described his wife as *'devastated'* after a previous discussion. V6 did not want family concerned about him: *'I think I might worry them a bit too much [..] that I was ill'* and V8 thought that her family would come to harm if she told them: *'if I told someone else they would also know, and then the [voices] would try and kill them as well'* (V8).

Participants were also mindful that voice hearing impacts the dynamics of their relationships, *'imagine there are two pillars supporting the roof and I sort of broke down and he has to be even stronger'* (V4), and V2 was aware of the impact of hearing voices on his young son after the voices told him *'we are going to take him off you'*, he explained *'I couldn't handle it [..] I had to [..] say look can we take him back to his mum tonight because I just, you know it's not fair me being like this'*. V6 who had found it helpful to check voice content with friends was concerned that this would reduce their perception of his trust in them *'I have insulted them a little bit[..] like I don't trust them'*.

People don't understand what I'm going through

The majority of participants felt that people around them do not understand voice hearing. For some this was due to people's lack of experience: *'it's difficult for anyone who hasn't been through it [..] to understand.'* (V2). In some instances, the lack of understanding led to people being perceived as dismissive of the participants' experiences: *'she doesn't really understand. I think she has always been one to say that I should just get on and kind of you know forget about [the voices]'* (V1), and lacking empathy: *'They all say it's completely in my head and there's no reality attached to it whatsoever, [..] no one really understands it'* (V15). V2, who invited his parents to listen out to the voices *'to see if it was there or not'* explained *'that was the frustrating part [..] they would say you know within three seconds we can't hear nothing'* but added *'As I*

probably wouldn't if I hadn't been through it'. V4 explained that her family would not listen to her experiences *'we just ended up in an argument. They don't want to really listen [..] just say it's illness, take medication'*. A lack of understanding resulted in some loved ones being less patient when in social situations *'I am not being rude and not listening to them it's just like I'm petrified listening to something else [..]. They don't understand that do they?'* (V7). This lack of understanding also extended to mental health services: *'I still clam up because I don't really want to tell anyone [what the voices say..] it goes back to CAMHS [..] when I tried to tell them, I wasn't believed.'* (V5).

We don't share the same reality

Hearing DTVs reduced the common ground with other people: *'because of the kind of er more of a focus on trying to rid myself of the noise it's like socially you know I have very little to say in a [..] social situation.'* (V1) and because voices were not a shared experience he described *'like I'm living two different lives at once, I have this kind of strange world in my mind and then I have the kind of physical reality of this world.'* (V1). For others, this led to loneliness: *'Quite, quite sad[..] Because I was the only one who was hearing voices.'* (V10). V13 described a sense of disconnect from friends because their lives had not been impacted on by voices: *'they have all got families of their own now and grown up, got families of their own, got careers and stuff. I just feel like I got left behind sort of thing.'*.

I fear stigma or negative judgement from others

Several participants described a difficulty talking to others because of a fear of judgement from others *'I haven't told anyone you know even, even best friend I would never tell them in this much detail. [..]it's you know it sounds mad isn't it, which it is you know'* (V2). Particular negative judgements that were feared from other people included the following: *'he is either a pervert, peeping tom or whatever'* (V2), *'either think you are lying [..] does she want attention, um is there something really wrong, [..] does she need to be put anywhere [into hospital]'* (V9) and *'I would be worried in case they take the mick or something.'* (V13). For some participants, fear of judgement was triggered by voice content: *'it's always been [the voices saying] that everybody else hates you and they don't need you and they think the worst of you'* (V5).

I might respond to the voices when I'm around other people

Responses to voices in some cases reduced the quality of relationships because *'sadly um they can make you um not so nice to be around.'* (V7) by being *'not aggressive but loud and [..] making people feel uncomfortable'* (V7). V4 had noticed the impact on her husband *'there are times I have to shout back to the voices and it does make things depressing for him'*. This also affected others *'I felt like I had not only embarrassed myself, but I had embarrassed [my family] as well'* (V7), resulted in apologies *'I had to like say sorry like blurting it out because I heard the voice'* (V13) and led to avoidance *'the bad results have come off the back of the voices happening. So, you just tend not to want to embarrass yourself as much again'* (V14).

The voices are listening to my conversation and there may be consequences from what I say

A few participants described purposefully not discussing things for fear of the voices listening *'that's why I stop myself at certain points and I have to go no, [..] I'm not going to talk about that'* (V15) or saying things that they hear *'I'm having two conversations yeah, sometimes I'm talking to you and I'm saying things that I know they are listening to'* (V15). Sharing voice content was difficult for many participants, and V5 explained that for her this was *'because I know I'm going to get a backlash. [..] I'm not allowed to tell people, that's been drummed into me since I was a kid.'*

It's confusing, working out who is speaking

A few participants described hearing voices when other people are talking: *'sometimes like I hear my name um being called [..] but sometimes somebody is actually calling me and it's like am I thinking or hearing it?'* (V7). V7 described this as *'amusing'*, however, V10 found it *'confusing because I don't know who is talking'*. and V5 described arguments with family about what they have said (or not).

The concentration required is hard or tiring

Difficulty concentrating on conversations was a common experience: *'when people are talking to me I might find it hard to concentrate on them if I am hearing things'* (V7) and the division of attention was tiring: *'doing this plus having ten other conversations [..] it's not taxing it's extremely tiring'* (V2). This impacted on the ability to chat to people: *'lost how to communicate I suppose verbally'* (V6), attend therapy: *'after ten minutes I was just so exhausted I said look I can't talk anymore'*. (V2) and was noticeable to others: *'[my husband] will notice sometimes [..] we could be having a conversation and I will quickly sort of flick and [..] for that split second you are kind of distracted.'* (V9).

Being around people can make DTVs worse

A few participants noted that people can trigger emotion which leads to voices: *'I don't like talking to my mum about [the voices] because she gets upset [..], that makes me start getting upset and then the voices just get worse'* (V10). People could also serve as a direct trigger: *'[the voices] can possess people around me and, and they can start talking through these people. And it's like they are talking at me directly'*. (V12). Paranoia, initiated by being around people, was also a common source for voice content: *'there was this elderly woman and elderly man[..] I think they were agents. She started talking derogatory, cynical, making fun of me, bullying me. That was a real woman, [..] one of the agents'* (V4). Being around others could also make the threatening voice content more challenging to dismiss: *'When I am in situations when I'm around people that's where I struggle with it feeling so real. [..] I will try and work out who is saying it, why they are saying it, [..] I guess that's where the paranoia crosses into things'* (V5).

The relationship between social connection and DTVs

Disengaging from social contact is a common initial response to hearing DTVs

Almost all participants referred to disengaging from social contact in response to hearing DTVs. This was described as 1. Isolating oneself from people *'You know you withdraw,*

you don't want to talk to people' (V2); 2. Turning away offered support *'friends would come to see me [..] I was just turning them away'* (V7); 3. Difficulty talking to other people *'I would go and see my family, but I wouldn't say anything to them really'* (V6); and 4. Difficulty sharing the experience of hearing voices *'six months I waited before I told my mum and dad. I had already gone to the doctors at that point [..] I was just so frightened to tell anybody'*. (V9). One participant who had heard voices for 15 years had not spoken to any family or friends about hearing them.

V3 described that withdrawal came prior to the onset of his voices, initially as a consequence of depression and anxiety, but triggered his first episode of voices: *'That was sort of I think the first that I experienced the voices. So, I think what sort of triggered it was becoming increasingly isolated and isolated from social exposure'*. (V3).

Social isolation can be a time of vulnerability to DTVs

Whilst there were clear reasons for isolating oneself, many participants also noted that DTVs more commonly occurred when they were alone: *'I think it occurs if I'm by myself [..] in my bedroom, that's when it will come'* (V11) and *'I tend to hear them when I'm on my, mostly on my own sort of thing'*. (V13). When alone DTVs were more central in attention *'when I am kind of on my own [..] they kind of really do occupy my kind of attention.'* (V1) and some participants were more inclined to believe what they say *'you could beat any of the strongest people down by you know making them solitary and then keep telling them something until they believed it'* (V2). V6 summarized the following: *'Not talking to people just made myself worse'*.

The experience of reconnecting and its association with recovery

Whilst some participants were still very isolated: *'the only people that I'm really in contact with on a kind of regular basis, is my mum and her husband. I don't really speak to him much, I speak to my mum occasionally'* (V1), around half of the participants described an increase in their social connections over time *'I had been inside for a month [..] I was getting all these voices, but I didn't really talk about it [..] Because the gym is [..] it's a 100 m walk. So, I thought I would just try and, try and do it'* (V3). Some described beginning to accept offers of help *'I have accepted the help of other people I guess. Its only then that I kind of feel like I have had some kind of a life'* (V5) and talking to people more: *'I have been talking to people and I haven't been shut away in my room'* (V10). These participants also tended to be the participants who were less troubled by their voices than previously. However, even those participants who had greater social recovery still chose not to share some voice content: *'they ask me what my voices are saying I still clam up because I don't really want to tell anyone'*. (V5).

Several participants noted an association between social connection and an improvement in their management of voices, for example: *'the more I could open up, the more I let my mates know, the more everything has settled down really'* (V5), *'over time talking about it helped so much. Because I found the more I supressed it the worse it got. [..]'* (V9), and *'a lot of where I have got to now is by talking'* (V7). V3 described intentionally getting a job which involved interacting with other people as a means of managing the voices: *'that's sort of why I got the job, to sort of force myself to go outside and um engage with the world [..] that's the way that I try to manage the voices is by um getting myself outside.'*.

These participants also looked back with the benefit of hindsight. V5 now speaks to friends to check out whether voice content is real or not and explained: *'I wish that's something that somebody had maybe said it's alright to do that'*. V7's top piece of advice to others was to *'talk about it,'*, he reflected *'the best thing I ever did was talked about it but then the worst thing I did was when I was 16 I didn't tell anyone. And then I ended up like having a complete breakdown'*. V3 explained *'I can't just um stay at home all the time because I know that they will get worse again.'*.

Increasing social connection can have benefits for DTVs

For some participants spending any time with others was still a challenge. But several participants reflected on the positive changes to voices when they were successfully able to manage connecting with other people. These included people providing an opportunity to dispute voice content *'[the voices] are telling me a red van is going to [..] pull me in and drive me off [..] if I voice it and then my mate can be like it's just your voices babe, like look around there's no red van'* (V5) but also whether the voices themselves are real or not: *'I tell friends about it and they say I don't hear anything you know there's nothing there'* (V6). Socializing also moved DTVs into the background of attention: *'I'm focused on the person [..] without even thinking about it I'm just not hearing the voices as much'* (V3). V6 noticed that socializing *'tends to help them not, not to occur in the first place'*.

Factors which enabled voice hearers to connect with others

Around half of participants discussed improvements in social connection over time. Below are the factors which facilitated social connections.

Learning to rebuild trust

When voices reduce trust in other people and trigger paranoia, reconnecting requires a process of rebuilding trust, particularly with clinicians: *'when you don't trust anybody there's nothing that a stranger could help you with initially until you have built up trust and built up a relationship'*. (V2). This process takes time *'that's really important that you take the time to let the person trust you'*. (V5) and knowledge about that person *'I suppose just the more you get to know someone I suppose'* (V7). Trusting also involves picking the right people to take that risk with: *'I feel like I have got the right people around me now to be able to trust in doing that'*. but also that *'you have got to have the right support network around you to do that'*. (V5). Trust was not a static process, but rather one that changed even on a daily basis: *'I'm only going to let one particular friend in today because she is the one I trust today'* (V5).

Connecting with other people who hear voices

Several participants noted that meeting people with lived experience of hearing voices (e.g., through voluntary sector organizations) was valued for over-coming several barriers to interacting with people, for example, for understanding *'It just helps quite a lot [..] I can talk quite freely and open, openly about things and they are not shocked or they understand'* (V13), having a shared reality *'it would be common ground'* (V2) and for not upsetting family and friends *'Friends and family, they are emotionally affected by your*

depressive stuff, and I think in the Hearing Voices group people tend to believe you which people may not get from elsewhere'. (V4).

Explaining the problem

To mitigate the risk of being judged for responding to voices, V2 described providing an explanation to neighbours: *'I said look if you hear me knocking about at night I'm really sorry I'm going through a tough time. [..] she was really lovely, and she was like thank you for coming around'* (V2). V5 felt concerned about stigma, but learnt that most people react better than expected: *'the only time you ever hear anything about somebody with schizo anything is when something really bad happens. So, if I tell people, people are going to think that I'm going to do that or I'm going to do this. Whereas actually the more I talk about it now the more people are like, to be fair I would never have noticed [..] And that [..] makes me open up more'*. V7 highlighted the element of choice over the narrative that's shared in order to overcome fears of judgement *'if I meet people now and I have to explain I say I have got a bit of depression, I get anxiety, I don't like saying I am schizophrenic because that's like a label and they put you in a category'*. and others commented that before sharing a diagnosis it was helpful to *'test the waters'* (V9) to gauge how people might react, or look for signs that it is safe to share.

If people are judgemental then you can choose to distance yourself from them

Some participants discussed the impact of stigma and misunderstanding related to diagnoses such as schizophrenia: *'when you come across someone that freaks out about it, it throws everything then'* (V5). However, a number of participants had learnt to reduce the impact on themselves: *'knowing that there are going to be people that find out, that aren't going to react well to it. And accepting that as well and taking the approach of if you don't like it don't be around me'* (V5). V9 agreed: *'I think in more recent years [..] I have kind of thought [..] if people don't like it that's their problem, not mine. If people are there and love you and accept it then they love you and accept you as well. So, [..] they have got an issue with then they are not worth your time'*.

Self-acceptance

Opening up to others first required an element of self-acceptance for some participants and over-coming a sense of shame: *'Whereas now I am quite open with it, I just think [..] It is not me but it's a part of me and why should I be ashamed of it?'* (V5). This also required accepting the bad days: *'you are allowed to feel unwell and you are allowed to have this. And just because you have these voices doesn't make you a bad person'*. (V9). This facilitated acceptance of help from others: *'I have accepted the illness and I have understood it [..]I have done what I have needed for me and I have accepted the help of other people'* (V5) and for V6 improved confidence enabled him to start asking his friends whether they had also heard the voices he hears. For V2, self-acceptance occurred spontaneously *'now [..]I can't be bothered to not be me'* but for V5, learning about her diagnosis was important, and for V9, non-judgemental healthcare professionals helped: *'Just to have someone there to listen to you and not judge you and understand you'*.

Knowing that some days it's OK to stay at home

Whilst participants shared many benefits from being around other people, there was acknowledgement that on some days staying at home is more helpful, particularly when paranoia is high and this might trigger voices *'if it's a bad voice day and I can't cope with feeling safe outside I just take a day to stay inside and just watch some films'* (V5) and *'I'm in an open wide space and I'm not used, [..] to it [..] when I get like that I am used to being in my room where I, I feel safe and I can question it'*. (V10). V5 explained that this can help overcome paranoia triggered by voices: *'when I'm by myself at least I can check everywhere in here and if there's no one in here I can put it down to my illness. I can trust my eyes.'*.

Other people persevering in their efforts to provide support

The persistence of others was valued in over-coming the instinct to disengage from people *'you don't want to talk to anyone and they kept ringing, they kept you know battling through until I spoke to them'* (V2). For V2, this helped because *'it shows they care'*, and for V5, it enabled her to question the voice *'I think they have a hard job doing it because when I believe it it's hard to tell me otherwise. But [..] if they carry on for long enough I will calm'*. And V7 felt emotionally affected by the perseverance: *'how loyal were my friends because they kept coming back [..] I was quite touched by that'*.

Shifting attention from the voices to the person

Some participants described training themselves to be less distracted by voices during a conversation. For some, this was an active process *'I like to think I have learned how to communicate better um and make sure instead of being so inward sort of focus on the other person you know'*. (V7) and *'if there were voices then that's how you learn to channel them out by speaking to you and actually listening to you'*. (V2), but for others, it came naturally *'A lot easier than you realise'* (V12). This was described as *'A skill that you didn't have before'* (V2).

Discussion

Social support is crucial though recovery from any serious illness. Yet for the participants in this study who experienced DTVs, it was difficult both to be around people and to share the experience of hearing voices, particularly at the early stages of illness. This reduces the opportunity for social support, and at first onset may lengthen the duration of untreated psychosis. Whilst the initial instinct was to disengage from people, isolation was also described as a time of vulnerability for hearing DTVs. Some participants learnt over time that being around people offered an opportunity for distraction and disputing voice content. However, this needed to be carefully managed, particularly avoiding interpersonal situations that might trigger voices (e.g., situations which trigger paranoia or strong emotion).

'Asociality' has previously been conceptualized as a negative symptom of schizophrenia and defined as a lack of interest in forming relationships (Marder & Galderisi, 2017). Rather than an inherent lack of interest, participants in this study described significant barriers to spending time with others, including difficulties during conversations (e.g., difficulties concentrating and working out who is speaking), voices triggering avoidance

(e.g., fear of responding to voices in public, or social interactions triggering voices), and difficulties sharing experiences of voice hearing (e.g., not wanting to upset others and a lack of understanding from others). The difficulty being around people was therefore not driven by a lack of interest, but rather an understandable attempt to avoid negative experiences linked to voice hearing. Indeed, participants were thoughtful about the impact that their voice hearing had on relationships and described feeling touched by people showing that they care. The detailed findings of this in-depth qualitative study clearly warrant further research into the social difficulties experienced by people who hear voices.

There are several potential limitations of this study. First, social interactions by their nature involve more than one person, yet this study learns from only one side of the interpersonal dynamic and at one particular point in time. Interviewing the social network of voice hearers and clinicians would offer an additional perspective. Second, participants consented to take part in this study which involved talking in-depth about their experience, and hence, the perspectives of people who are unable to talk about their voices are likely less heard and may alter the results. Third, recruitment was not driven by this research question, and although there was considerable detail present in the findings, data saturation on the topic was not achieved. This particularly applies to factors which enabled voice hearers to connect with others, which reflect a smaller sub-group of participants. Further studies designed specifically to answer the research question will test the findings from this smaller group.

Whilst this manuscript was focused on being around people whilst hearing DTVs, participants were also invited to describe their relationship with their voice(s), owing to the established links between social schemata, voice, and social relationships (Birchwood *et al.*, 2004). Many participants described no relationship (e.g., *'I don't know. I don't think I really have a relationship with them',* V1), which parallels results from a previous qualitative study (Chin, Hayward, & Drinnan, 2009). Others described the relationship as abusive (e.g., *'Oh, violation, persecution, harassment.'*, V4) which is understandable given that all heard DTVs. Given that these data are not related to the experience of being around people, these findings were not included in the resultant themes. However, further research investigating social schemata (assessed via quantitative methods or alternative qualitative questions) and the impact on social networks would be valuable, particularly given the existence of relational therapies (Craig *et al.*, 2018; Hayward, Jones, Bogen-Johnston, Thomas, & Strauss, 2017).

It was strikingly sad to hear participants describe the sometimes debilitating experience of hearing DTVs, alongside descriptions of feeling unable to talk to people about it, and hence not receive the social support concomitant with a severe illness. Clearly at a societal level more work is required to correct the common misconceptions about diagnoses such as schizophrenia. This might reduce the chances of a negative reception towards such diagnoses. Increasing access to existing psychological interventions might also enable a more open dialogue about voice hearing. For example, family interventions provide a safe forum for the social network to discuss voice hearing and are already a recommended treatment (National Collaborating Centre for Mental Health, 2014). Hearing voices groups (Ruddle, Mason, & Wykes, 2011) and the hearing voices network (Longden, Read, & Dillon, 2018) enable voice hearers to meet other people with lived experience of voice hearing. Lastly, interventions already exist which enable voice hearers to tackle shame (Morrison *et al.*, 2016) and social recovery (Fowler *et al.*, 2018). These treatment options might be further optimized by targeting the additional factors identified in this study such as fostering trust, learning to switch attention, and developing

a narrative to explain voices to people. Optimizing treatments for social connections is important in its own right. The potential to also impact on voice hearing, as described in this study, suggests that social networks might be a vehicle for disengaging from and disputing DTVs. This warrants further investigation.

Acknowledgements

We are enormously grateful to the participants who shared their stories as part of this research. We also thank Rachel Temple, Anja Hollowell, and Thomas Kabir from the McPin Foundation for their expertise in facilitating lived experience involvement. BS is funded by a National Institute for Health Research (NIHR) clinical doctoral research fellowship (ICA-CDRF-2017-03-088) for this research project. DF is funded by an NIHR Research Professorship (NIHR-RP-2014-05-003). This publication presents independent research funded by the NIHR. The views expressed are those of the authors and not necessarily those of the NHS, the NIHR, or the Department of Health and Social Care. EČ is supported by a Wellcome Trust Clinical Doctoral Fellowship (102176/B/13/Z). LJ is employed by Oxford Health NHS Foundation Trust.

Conflicts of interest

All authors declare no conflict of interest.

Author contribution

BS, LJ, DF, and LG conceived of the study with consultation from the McPin Hearing Voices Lived Experience Advisory Panel. BS collected the data. BS, EČ, and the McPin Hearing Voices Lived Experience Advisory Panel analysed the data with supervision from LG, DF, and LJ. BS drafted the manuscript, all authors edited it, and approved the final version for publication. BS takes overall responsibility for the integrity of the work.

Data availability statement

In order to maintain the confidentiality of participants, data are not accessible.

References

Birchwood, Max, 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*, 1571–1580. https://doi.org/10.1017/S0033291704002636

Bogen-Johnston, L., de Visser, R., Strauss, C., Berry, K., & Hayward, M. (2017). "That little doorway where I could suddenly start shouting out": Barriers and enablers to the disclosure of distressing voices. *Journal of Health Psychology*, *24*, 1307–1317. https://doi.org/10.1177/1359105317745965

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. https://doi.org/10.1348/147608308X320116

Corbin, J., & Strauss, A. (2015). *Basics of qualitative research*. Los Angeles, CA: Sage.

Craig, T. K., Rus-Calafell, M., Ward, T., Leff, J. P., Huckvale, M., Howarth, E., . . . Garety, P. A. (2018). AVATAR therapy for auditory verbal hallucinations in people with psychosis: A single-blind, randomised controlled trial. *The Lancet Psychiatry*, *5*(1), 31–40. https://doi.org/10.1016/S2215-0366(17)30427-3

DeVylder, J. E., Lehmann, M., Chen, F. P. (2015). Social and clinical correlates of the persistence of psychotic experiences in the general population. *Schizophrenia Research*, *169*(1–3), 286–291. https://doi.org/10.1016/j.schres.2015.08.039

Fowler, D., Hodgekins, J., French, P., Marshall, M., Freemantle, N., McCrone, P., . . . Birchwood, M. (2018). Social recovery therapy in combination with early intervention services for enhancement of social recovery in patients with first-episode psychosis (SUPEREDEN3): A single-blind, randomised controlled trial. *The Lancet Psychiatry*, *5*(1), 41–50. https://doi.org/10.1016/S2215-0366(17)30476-5

Hayward, M., Jones, A. M., Bogen-Johnston, L., Thomas, N., & Strauss, C. (2017). Relating therapy for distressing auditory hallucinations: A pilot randomized controlled trial. *Schizophrenia Research*, *183*, 137–142. https://doi.org/10.1016/j.schres.2016.11.019

Longden, E., Read, J., & Dillon, J. (2018). Assessing the impact and effectiveness of hearing voices network self-help groups. *Community Mental Health Journal*, *54*(2), 184–188. https://doi.org/10.1007/s10597-017-0148-1

Marder, S. R., & Galderisi, S. (2017). The current conceptualization of negative symptoms in schizophrenia. *World Psychiatry*, *16*(1), 14–24. https://doi.org/10.1002/wps.20385

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. https://doi.org/10.1348/147608310X524883

Meltzer, H., Bebbington, P., Dennis, M. S., Jenkins, R., McManus, S., & Brugha, T. S. (2013). Feelings of loneliness among adults with mental disorder. *Social Psychiatry and Psychiatric Epidemiology*, *48*(1), 5–13. https://doi.org/10.1007/s00127-012-0515-8

Michalska Da Rocha, B., Rhodes, S., Vasilopoulou, E., & Hutton, P. (2018). Loneliness in psychosis: A meta-analytical review. *Schizophrenia Bulletin*, *44*(1), 114–125. https://doi.org/10.1093/schbul/sbx036

Morrison, A. P., Burke, E., Murphy, E., Pyle, M., Bowe, S., Varese, F., . . . Wood, L. J. (2016). Cognitive therapy for internalised stigma in people experiencing psychosis: A pilot randomised controlled trial. *Psychiatry Research*, *240*, 96–102. https://doi.org/10.1016/j.psychres.2016.04.024

National Collaborating Centre for Mental Health. (2014). *Psychosis and Schizophrenia in adults: The NICE guideline on treatment and management*.

Norman, R. M. G., Malla, A. K., Manchanda, R., Harricharan, R., Takhar, J., & Northcott, S. (2005). Social support and three-year symptom and admission outcomes for first episode psychosis. *Schizophrenia Research*, *80*(2–3), 227–234. https://doi.org/10.1016/j.schres.2005.05.006

Onwumere, J., Parkyn, G., Learmonth, S., & Kuipers, E. (2019). The last taboo: The experience of violence in first-episode psychosis caregiving relationships. *Psychology and Psychotherapy: Theory, Research and Practice*, *92*(1), 1–19. https://doi.org/10.1111/papt.12173

QSR International Pty Ltd (2018). *NVivo*. Retrieved from https://qsrinternational.com/nvivo/nvivo-products/

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. https://doi.org/10.1016/j.cpr.2011.03.010

Salokangas, R. K. R. (1997). Living situation, social network and outcome in schizophrenia: A five-year prospective follow-up study. *Acta Psychiatrica Scandinavica*, *96*(6), 459–468. https://doi.org/10.1111/j.1600-0447.1997.tb09948.x

Sheaves, B., Johns, L., Griffith, L., Isham, L., Kabir, T., & Freeman, D. (2020). Why do patients with psychosis listen to and believe derogatory and threatening voices? 21 reasons given by patients. *Behavioural and Cognitive Psychotherapy*, 1–15. https://doi.org/10.1017/S1352465820000429. [Epub ahead of print].

Sündermann, O., Onwumere, J., Kane, F., Morgan, C., & Kuipers, E. (2014). Social networks and support in first-episode psychosis: Exploring the role of loneliness and anxiety. *Social Psychiatry and Psychiatric Epidemiology*, *49*(3), 359–366. https://doi.org/10.1007/s00127-013-0754-3

Van Os, J., Driessen, G., Gunther, N., & Delespaul, P. (2000). Neighbourhood variation in incidence of schizophrenia. *British Journal of Psychiatry*, *176*(3), 243–248. https://doi.org/10.1192/bjp.176.3.243

Watkins, S., Gupta, A., & Sanderson, C. (2019). The experience of talking about hearing voices with family, friends, and others. *Psychosis*, *12*(1), 1–10. https://doi.org/10.1080/17522439.2019.1690561

Xu, Z., Müller, M., Heekeren, K., Theodoridou, A., Metzler, S., Dvorsky, D., . . . Rüsch, N. (2016). Pathways between stigma and suicidal ideation among people at risk of psychosis. *Schizophrenia Research*, *172*(1–3), 184–188. https://doi.org/10.1016/j.schres.2016.01.048

Received 30 March 2020; revised version received 20 July 2020

Supporting Information

The following supporting information may be found in the online edition of the article:

Appendix S1. Supplementary materials: supplementary methods, interview schedule and audit trail.